

U. S. DEPARTMENT OF LABOR

JAMES J. DAVIS, Secretary

CHILDREN'S BUREAU

GRACE ABBOTT, Chief

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PHYSICAL STATUS  
OF PRESCHOOL CHILDREN

GARY, IND.

BY

ANNA E. RUDE, M. D.



Bureau Publication No. 111



WASHINGTON  
OVERNMENT PRINTING OFFICE

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CHICAGO, ILL.

BY  
ANNA E. KILPATRICK, D.

First Published, 1917



GOVERNMENT PRINTING OFFICE

## CONTENTS.

	Page.
Letter of transmittal.....	9
Introduction.....	11-13
Scope of study.....	12
Staff.....	12
Methods and standards used.....	13-26
General method of conducting examinations.....	14
Physical examination record form used.....	15
Instructions accompanying physical examination schedule.....	18
Measuring and weighing.....	21-23
Height.....	21
Weight.....	22
Vision testing.....	23
Hearing testing.....	24
Indications for recommending removal of tonsils and adenoids.....	25
Physical findings.....	27-62
Introduction.....	27
Findings in general.....	28
Height and weight.....	32
Nutrition.....	36
Anemia.....	39
Vaccination.....	40
Head.....	41
Eyes.....	42
Ears.....	44
Mouth.....	44-45
Teeth.....	44
Other mouth defects.....	45
Nasopharynx.....	45-62
Adenoids.....	46
Symptoms suggesting adenoids.....	47
Tonsils.....	48
Lymph glands.....	51
Lungs.....	55
Heart.....	55
Skin.....	55
Abdomen.....	56
Bony and muscular systems.....	57-61
Bony defects of rachitic origin.....	58
Postural defects.....	59
Arch measurements.....	60
Nervous system.....	61
Mental condition.....	62
Genitalia.....	62

	Page.
Appendixes.....	63-83
Appendix A.—General tables on physical findings of the preschool child..	65
Appendix B.—Results of physical examinations of children under 2 years of age.....	75-83
Source of material.....	75
Findings in general.....	75
Height and weight.....	77
Nutrition.....	77
Anemia.....	78
Vaccination.....	78
Head.....	78
Eyes.....	78
Ears.....	79
Mouth.....	79
Nasopharynx.....	79-80
Tonsils.....	80
Adenoids.....	80
Glands.....	80
Heart.....	81
Lungs.....	81
Skin.....	81
Abdomen.....	81
Bony and muscular system.....	82
Arch measurements.....	83
Mental condition.....	83
Genitalia.....	83

TEXT TABLES.

	Page.
TABLE I. Age and sex; children from 2 to 7 years of age given physical examination .....	27
II. Prevalence of defects, by sex; children 2 to 7 years of age given physical examination .....	28
III. Number of defects, by age and sex; children 2 to 7 years of age given physical examination .....	30
IV. Average heights and weights, by sex and age; white children 7 years of age and under given physical examination .....	36
V. Grade of nutrition, by age and sex; children 2 to 7 years of age given physical examination .....	38
VI. Grade of nutrition, by color and nationality of mother; children 2 to 7 years of age given physical examination .....	39
VII. Grade of nutrition, by earnings of chief breadwinner; children 2 to 7 years of age given physical examination .....	39
VIII. Vaccination, by age and sex; children 2 to 7 years of age given physical examination .....	40
IX. Vaccination, time of vaccination, and entrance in school, by color and nationality of mother; children 2 to 7 years of age given physical examination .....	41
X. Defect of vision, by age; children 2 to 7 years of age given physical examination .....	42
XI. Vision, by sex and eye disease or other defect; children 2 to 7 years of age given physical examination .....	43
XII. Eye disease or defect other than of vision, by color and nationality of mother; children 2 to 7 years of age given physical examination .....	43
XIII. Decayed teeth, by age and sex; children 2 to 7 years of age given physical examination .....	44
XIV. Naso-pharyngeal defect, by age and sex; children 2 to 7 years of age given physical examination .....	45
XV. Adenoid condition, by age and sex; children 2 to 7 years of age given physical examination .....	46
XVI. Condition of tonsils, by age and sex; children 2 to 7 years of age given physical examination .....	49
XVII. Prevalence of diseased tonsils, by presence of decayed teeth; children 2 to 7 years of age given physical examination .....	51
XVIII. Condition of glands, by age and sex; children 2 to 7 years of age given physical examination .....	52
XIX. Condition of cervical glands, by condition of tonsils and teeth; children 2 to 7 years of age given physical examination .....	53
XX. Condition of glands, by color and nationality of mother; children 2 to 7 years of age given physical examination .....	54
XXI. Distended abdomen, by age and sex; children 2 to 7 years of age given physical examination .....	56
XXII. Defect of bony and muscular system, by age and sex; children 2 to 7 years of age given physical examination .....	57
XXIII. Postural defects, by age and sex; children 2 to 7 years of age given physical examination .....	60

## APPENDIX TABLES.

	Page.
APPENDIX A—General tables.....	65-73
TABLE 1. Prevalence of defects, by sex; children 2 to 7 years of age given physical examination.....	65
2. Specified defects, by age and sex; children 2 to 7 years of age given physical examination.....	65
3. Specified defects, by color and nationality of mother; children 2 to 7 years of age given physical examination.....	67
4. Specified defects, by earnings of chief breadwinner; children 2 to 7 years of age given physical examination.....	67
5. Per cent of children with specified defects, by deviation from average weight for height; children 2 to 7 years of age given physical examination.....	67
6. Specified skin diseases, by age and sex; children 2 to 7 years of age given physical examination.....	68
7. Condition of specified glands, by sex; children 2 to 7 years of age given physical examination.....	69
8. Specified defects of bony and muscular system, by age and sex; children 2 to 7 years of age given physical examination.....	70
9. Relation of weight to height, by age and sex; children 2 to 7 years of age given physical examination.....	70
10. Relation of weight to height, by color and nationality of mother; children 2 to 7 years of age given physical examination.....	71
11. Prevalence of specified defects, by deviation from average weight for height; children 2 to 7 years of age given physical examination.....	72
12. Annual earnings of chief breadwinner, by color and nativity of mother; children 2 to 7 years of age given physical examination.....	73
APPENDIX B:	
TABLE I. Number of defects, by age and sex; children under 2 years of age given physical examination.....	75
II. Prevalence of disease or defects, by sex; children under 2 years of age given physical examination.....	76
III. Grade of nutrition, by age and sex; children under 2 years of age given physical examination.....	77
IV. Deviation from average weight for height, by age and sex; children under 2 years of age given physical examination.....	78
V. Nasopharyngeal defects, by age and sex; children under 2 years of age given physical examination.....	79
VI. Condition of tonsils, by age; children under 2 years of age given physical examination.....	80
VII. Condition of glands, by age and sex; children under 2 years of age given physical examination.....	81
VIII. Rickets, by age and sex; children under 2 years of age given physical examination.....	82
IX. Rickets, by condition of tonsils; children under 2 years of age given physical examination.....	82
X. Condition of glands, by presence of rickets; children under 2 years of age given physical examination.....	83
XI. Comparison of the prevalence of defects in children under 2 years of age and children 2 to 7 years of age given physical examination.....	83



## CHARTS.

	Page.
CHART I. Average heights of boys from birth to six years of age; Children's Year, Gary, Gary and Health Conferences combined, and Crum.....	32
II. Average heights of girls from birth to six years of age; Children's Year, Gary, Gary and Health Conferences combined, and Crum.....	33
III. Average weights of boys from birth to six years of age; Children's Year, Gary, Gary and Health Conferences combined, and Crum.....	34
IV. Average weights of girls from birth to six years of age; Children's Year, Gary, Gary and Health Conferences combined, and Crum.....	35
V. Per cent of children having one or more defects, from birth to six years of age.....	84

## ILLUSTRATIONS.

	Page.
Measuring.....	Faces 22
Measuring square.....	Faces 22
Measuring strip.....	Faces 22
Weighing in scoop scale.....	Follows 22
Weighing on beam scale.....	Follows 22
Vision testing.....	Faces 23
Hearing testing.....	Faces 23



**LETTER OF TRANSMITTAL.**

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U. S. DEPARTMENT OF LABOR,  
CHILDREN'S BUREAU,  
*Washington, April 29, 1922.*

SIR: There is transmitted herewith a report on the Physical Status of Preschool Children, Gary, Ind., by Dr. Anna E. Rude, director of the child hygiene division of the Children's Bureau. The investigation on which the report is based was planned by Dr. Grace Meigs Crowder, formerly director of the child hygiene division of the bureau. All the field work of the investigation was in charge of Doctor Rude, and the material has been organized by her with the assistance of Caroline Legg.

Respectfully submitted.

GRACE ABBOTT, *Chief.*

Hon. JAMES J. DAVIS,  
*Secretary of Labor.*

CENTRE OF THE HOSPITAL

THE HOSPITAL

The Hospital is a charitable institution for the relief of the poor and infirm. It was founded in the year 1745, and has since that time been the scene of many noble and heroic deeds. The Hospital is situated in the city of London, and is one of the most famous and ancient hospitals in the world. It is a place of refuge for the poor and infirm, and is a source of comfort and relief to many of the most deserving of the human race. The Hospital is a place of learning and of industry, and is a source of pride and honor to the city of London. It is a place of hope and of faith, and is a source of strength and courage to all who are afflicted with poverty and disease. The Hospital is a place of love and of kindness, and is a source of joy and of happiness to all who are in need of its aid and assistance.

THE HOSPITAL

THE HOSPITAL

# PHYSICAL STATUS OF PRESCHOOL CHILDREN, GARY, IND.

## INTRODUCTION.

In connection with the social and economic study of infant mortality and the preschool child in Gary, Ind., made in 1918 by the United States Children's Bureau, an investigation to determine the physical condition of the children was conducted by the hygiene division of the bureau. In all, 4,348 individual examinations of children under 7 years of age were made during the six-month period extending from April to October.

The splendid interest and hearty cooperation of the Gary school authorities made possible the systematic examination of practically all children under 7 years of age who were attending the kindergartens and primary grades in all the public schools and in three parochial schools.

The school examinations occupied the first three months of the investigation, following which the examinations were conducted in children's health conferences. The first conference center was in a vacant store in the center of the business district on the North Side of Gary. The conference rooms were open from 9 o'clock in the morning until 4.30 o'clock in the afternoon every day except Saturday and Sunday. Children were examined by appointment only. The second conference or consultation center was opened for the last two months of the study on the South Side of the city, where a large proportion of the foreign population lived.

In order to stimulate interest in the health conferences and instruct the public as to their general purpose, the cooperation of the Gary Children's Year Committee of the Council of National Defense was enlisted. This committee secured active interest and cooperation from the mayor, the women's organizations, the men's clubs, and the school authorities, and conducted a poster contest on the subject of child care in the Gary schools. Two men's organizations, the commercial club and the chamber of commerce, donated \$75 for prizes in the form of thrift and war-savings stamps.

An exhibition of posters from all the school grades in a down-town shop window, prior to the awarding of the prizes, helped to arouse

interest and attract attention to the forthcoming conferences, where a large collection of posters was finally displayed.

Another feature of the conferences which attracted considerable attention was the exhibit of small models which included a bed properly prepared for a mother at confinement, baskets and cribs for the baby, the necessary bath equipment, utensils for preparing food and Pasteurizing milk, an iceless refrigerator, play pens, simple and cheap homemade screens, etc. There were also models of infants' clothes, and paper patterns from which the mothers might cut duplicates if they so desired. Simple meals for the preschool child were shown in a glass case, and the values of particular kinds of food were explained by a nurse. Children's Bureau publications dealing with prenatal care and the care of infants and young children were displayed, and given free to persons desiring them. Much interest was evinced in these exhibits, and in the wall charts which pictured various phases of child care with warnings and suggestions to mothers.

#### SCOPE OF STUDY.

Tabulations were made of the records of 3,125 children whose ages ranged from 2 to 7 years,<sup>1</sup> and of 994 infants under 2 years of age. The data relating to the latter are presented in Appendix B, but the descriptions of methods include those used in the examinations both of infants and of older children. In both age groups the distribution by sex was fairly even. The older group included 1,555 boys and 1,570 girls. It was possible to make certain correlations for this group with items on the family schedules which were taken for all of these children in the general study of children of preschool age made by the Children's Bureau.<sup>2</sup>

#### STAFF.

The regular working staff consisted of three physicians, two nurses, and four clerical assistants.

A specialist from Chicago was engaged for one day a week to examine all children who had been found upon examination to have eye, ear, nose, or throat defects. These special examinations were discontinued after the conferences were begun, owing to the fact that the majority of the examinations in the conferences were of infants and the comparative infrequency of these defects in infancy made the services of the specialist seem unwarranted.

During the examinations in the schools, the school nurses were loaned to the Children's Bureau staff for almost full-time assistance.

<sup>1</sup> Included in this group were 220 children who had passed their seventh birthdays between the date of beginning the study and the date of the physical examination. Since the majority of these 220 children were still less than 7½ years of age, and since data concerning them appeared in the family schedules which had been taken and had already been incorporated in other reports on the Gary investigation, they have been included in all discussions where ages are not distinguished; but where ages are distinguished this group is not separately discussed.

<sup>2</sup> Children of Preschool Age in Gary, Ind. (In press.)

They determined from the school register what children were eligible for examination, notified parents as to date and time of examination, invited them to be present, and brought the children in turn to the examination room. The interest of the parents was most encouraging; in several of the school districts approximately 75 per cent of the mothers were present for the examinations. The nurses also helped with the undressing and dressing processes. During the entire study they rendered valuable assistance by following up cases reported by the physicians as in need of special attention. One nurse acted as interpreter, such service being indispensable during the conference on the South Side of Gary, where the families of the foreign-born predominated. A list of the defects noted upon examination was transcribed on the school physical examination card for a permanent school record, a duplicate of which was sent by the school authorities to the parents.

### METHODS AND STANDARDS USED.

The chief value of this report on the physical condition of the preschool child in a typical industrial center lies, perhaps, not so much in the data gathered as in the presentation of the methods and standards used in the study. The dearth of definite information regarding the physical condition of the preschool child is noteworthy; the data obtained in this investigation are offered as the result of uniformly careful examinations. The usual lack of uniformity in methods of examination, record forms, etc., makes for apparent unreliability in data, and this has a tendency to lower rather than to raise standards. It is doubtful if any physical examination record form or method of examination would meet with universal approval. The methods and standards used in this study are not offered as ideal; but since there is a generally recognized need for standardization in all phases of child-welfare work, the plan has been given in detail in the hope that the report may serve to some extent as a handbook for similar scientific investigations as well as for the less technical popular health activities of both private and Governmental organizations.

In order that data gathered in this study might conform to the standard of exactness required in making statistical tabulations, it was necessary to plan definite standards for recording observations. The difficulties involved are readily recognizable, since much of the information secured through ordinary physical examinations shows variation, according to the individual examiner's judgment. While such data may be sufficiently accurate for clinical purposes, they do not have the degree of conciseness and uniformity necessary for statistical tabulations.

**GENERAL METHOD OF CONDUCTING EXAMINATIONS.**

The following general procedure was adhered to almost without exception throughout the six months devoted to the physical examinations recorded in this study.

The child was first given the vision and hearing tests, in a room specially set aside for the purpose. This was done first in order to eliminate the possibility of any nervous strain after subjection to the physical examination. It was most important in testing eyes and ears to gain the child's undivided attention, for if it was at all strained or unnatural the results were necessarily less accurate. Moreover, by subjecting him at the start to an active rather than a passive examination, i. e., to one in which his own faculties were exercised, the child's cooperation and confidence were secured for the more trying ordeal of a complete physical examination. The details of the vision and hearing tests and the method of grading will be described subsequently.<sup>3</sup>

After the tests of sight and hearing were completed the child was directed to a dressing room and completely undressed by a nurse or parent; separate rooms were provided for boys and girls. As soon as the clothing was removed the child's body was covered with a clean square of flannelette fastened around the trunk and falling to the knees, and the height and weight were taken. This was done either at one end of the large room in which the examinations were made or in a smaller separate room, according to available facilities. After the record of height and weight was made the child was ready for the doctor.

The physical examination was strictly private, each physician having a curtained booth about 8 by 10 feet. The examining table was covered with a clean white sheet and provided with all necessary equipment for making a thorough physical test, including stethoscope, thermometer, tongue blades, culture tubes and slides, standard tape measures and rulers, paper towels, facilities for sterilizing instruments, and celluloid toys which were used to divert the attention of younger children during the more trying parts of the examination. A clerical assistant at one end of the table recorded the details of the examination as dictated by the doctor, and noted such facts as date of birth, age at entering school, grade attained, and history of previous illnesses.

A record of height and weight, vision and hearing grades, and defects found, if any, together with suggestions concerning their correction and dietary advice applicable to the individual child, were given to the mother before she left the conference rooms.

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<sup>3</sup> See pp. 23 and 24.



**PHYSICAL EXAMINATION RECORD FORM USED.**

A physical examination record form was prepared from which statistical data could easily be transcribed. While to the average physician this form may appear unnecessarily detailed for practical use, experience has shown that the system of establishing uniform standards and then requiring every item to be checked is probably the only means of insuring sufficiently accurate and detailed information in routine physical examinations.

The practicability of this particular record form has been tested by use both in this study and in subsequent work. Some of the items could well be omitted, and the form could be made practical for continued use only by providing space for the records of repeated examinations on the reverse side of the card. The general arrangement, however, has proved satisfactory and practical from a statistical standpoint.

CHILDREN'S BUREAU.

SURNAME..... FATHER..... CHILD..... ADDRESS.....  
 SCHOOL..... EXAMINED BY..... DATE..... 1918.

[PHYSICAL EXAMINATION RECORD FORM.]

PHYSICAL STATUS OF PRESCHOOL CHILDREN.

Sym.	Sym.	CHILD: 1. M. F. 2. Born 191 . 3. Age yrs. mos. 4. Entered (a) Kinderg't'n, N., at yrs. (b) First grade, N., at yrs.	NASOPHARYNX: 30. Mouth breathing, N. 31. Nasal discharge, N. 32. Nasal obstr., N. 33. High arch palate, N. 34. Tonsils: Rem. (a) enlrg., N. (b) greatly enlrg., N. (c) dis. N. 35. Other abnorm. 36. <i>Diagnosis of Sp.</i>	SKIN: 43. Pediculosis: (a) body, N. (b) scalp, N.; insects, N.; nits, N. 44. Eczema, N. (loc.) 45. Acne, N. 46. Hypertrichosis, N. 47. Impetigo, N. 48. Infected sores, N. 49. Scabies, N. 50. Ringworm: (a) scalp, N. (b) body, N. 51. Other conditions.	
		PHYSICAL EXAMINATION. GENERAL: 5. Weight lbs. oz. 6. Height in. 7. Anemia, N. 8. Nutrition: Excel., G., P., VP. 9. Temp. 10. Vaccinated, N. (a) Age yrs. (b) Scar, N. HEAD: 11. Size: Normal, large, small. Circumference in. 12. Shape: Normal, abnorm. (spec.). 13. Fontanelle: Closed, open cm. 14. Craniotabes, N. 15. Abnormal condition, N. 16. <i>Diagnosis:</i> EYES: 17. Vision (a) R. (b) L. (c) Imposs. to test.	GLANDS: 37.	ABDOMEN: 52. Distension, N. 53. Tenderness, N. (loc). 54. Enlarged liver, N. 55. Enlarged spleen. 56. Hernia, N.; umbilical; inguinal, R.; L., double; femoral, R., L. double. 57. Other defects.	
		18. Defects.	(a) Occipital..... Y N Y N Y N N (b) Submaxillary... Y N Y N Y N N (c) Cervical..... Y N Y N Y N N (d) Axillary..... Y N Y N Y N N (e) Epitrochlear... Y N Y N Y N N (f) Inguinal..... Y N Y N Y N N (g) Other..... Y N Y N Y N N	BONY AND MUSCULAR SYSTEM: 58. Beaded ribs, N. 59. Harrison's groove, N. 60. Enlarged epiphyses, N. 61. Round shoulders, N. 62. Winged scapulae, N. 63. Scoliosis, N. 64. Lordosis, N. 65. Kyphosis, N. (loc.). 66. Knockknee, N. 67. Bow legs, N. 68. Flat foot, N. 69. Pigeon breast, N. 70. Club foot, N. (spec.). 71. Arthritis, N. (spec.). 72. Paralysis, N. (spec.). 73. Other defects (cong. and acq.).	
		(a) Blepharitis..... (b) Styte..... (c) Ptosis..... (d) Corneal opacities..... (e) Corneal ulcer.....	HEART: 38. Heart. (a) Apex beat displ., N. (b) Enlarged N. (c) Murmur, N. (loc.) Transmitted back, axilla, sternum, N. 39. Heart disease, N., <i>Diagnosis:</i>	NERVOUS SYSTEM: 74. Speech defects, N. (a) Stuttering, N. (b) Stammering, N. 75. Tic, N (spec.). 76. Chorea, N. (spec.). 77. Other defects. 78. Nervous dis., N., <i>Diagnosis:</i>	
		(f) Conjunctivitis: N Acute..... Chronic..... Phlyctenular... (g) Strabismus.....	LUNGS: 40. Chest: (a) Excursion: Normal, abnorm. (spec.). (b) Fremitus: Normal, decr., incr. (c) Dullness, N. (spec.). (d) Rales: N., kind loc.		
		19. Glasses, N.	41. Other defects. 42. Respiratory dis., N., <i>Diagnosis:</i>		
		20. Other abnorm. 21. <i>Diagnosis of Sp.</i> EARS: 22. Hearing: R. ft. L. ft. 23. Otorrhea: (a) Acute, N., R., L. (b) Chronic, N., R., L. 24. Other abnorm. 25. <i>Diagnosis of Sp.</i> MOUTH: 26. Teeth: (a) Temp. No. Decayed No. Filled No (b) Perm. No. Decayed No. Filled No. 27. Malocclusion, N. 28. Gum abscess, N. 29. Other abnorm.			

## [RECORD FORM—REVERSE.]

GENITALIA: 79. Male: prepuce adherent, contracted, normal.

80. Female: vaginal discharge, N.

MENTAL CONDITION: 81. (a) Normal, N. (b) Defect app. (spec.).

(c) Abnormality susp. (spec.)

82. LABORATORY FINDINGS:

83. PREVIOUS ILLNESS: (a) Contagious:

(b) Respiratory:

(c) Digestive:

(d) Other:

84. BAD HABITS:

85. SUMMARY OF DEFECTS AND DISEASES:

86. RECOMMENDATIONS:

108178°—22—2

## INSTRUCTIONS ACCOMPANYING PHYSICAL EXAMINATION SCHEDULE.

Every question on the schedule must be checked. If abnormal, check this word or the condition listed; if normal, check N, meaning "No" or not abnormal. Care should be taken that the check is in the letter or word intended. Carelessness in checking means inaccuracy in tabulations, and schedules with omissions deplete the total base or are thrown out.

## GENERAL.

(5)<sup>4</sup> **WEIGHT.** To be taken without clothes.

(6) **HEIGHT.** To be taken without shoes.

Measuring board to be brought down until horizontal part just touches child's head firmly while perpendicular part is pressed against the wall. Most mistakes are made in reading; therefore measurements to be taken twice, once before and once after examination, and entry made on record after the second measurement.

(7) **ANEMIA.** To be determined by inspection of color of mucous membranes, especially conjunctivae.

(8) **NUTRITION.**<sup>5</sup> "Excellent" indicates a condition superior to "good." "Good" is to be checked if the child's weight is within a 10 per cent deviation below average weight for height. "Poor" to be checked when weight is below 10 per cent deviation from average weight for height and when supervision is required. "Very poor" to be checked where weight is more than 10 per cent below average weight for height and medical treatment is required. "Poor" or "very poor" is always to be noted under Summary and Recommendations.

(9) **TEMPERATURE.** To be taken only if symptoms indicate.

(10) **VACCINATED.** Unless the mother is with the child it may not be possible to ascertain the age at which he was vaccinated for smallpox, but it may be learned from the teacher whether or not it was done before he entered school.

## HEAD.

(11) **SIZE.** If abnormal, the fronto-occipital circumference is to be measured with tape and the measurement recorded.

(12) **SHAPE.** If abnormal, "square head," "hydrocephalic," "oxycephalic," or "scaphocephalic" may be specified.

(13) **ABNORMAL CONDITION.** Here may be noted abnormal conditions of scalp, features, hair, etc.

## EYES.

(17) **VISION.** To be tested by one person, using "illiterate" chart.<sup>6</sup> All cases of defective vision to be listed and referred for consultation with specialist.

(20) **OTHER ABNORMALITIES.** Such conditions as nystagmus, etc., to be noted here and every case to be listed for consultation with the specialist.

<sup>4</sup> Figures refer to items on record form.

<sup>5</sup> See page 36.

<sup>6</sup> For details of vision testing, see page 23.

## EARS.

(22) HEARING. To be tested by one person, using "whispered voice." If hearing is defective or there is any discharge, the child is to be listed and referred to the specialist for examination for cerumen, retracted drums, and adenoids.

## MOUTH.

(27) MALOCCLUSION. Includes any condition causing an abnormal bite.

(29) OTHER ABNORMALITIES. Here should be noted general conditions of cleanliness and types of teeth, such as syphilitic, rachitic, and those devoid of enamel, abnormal condition of gums and mucous membranes, badly coated tongue, offensive breath, etc.

## NASOPHARYNX.

Children with colds are to be excluded from examination until well.

(30) MOUTH BREATHING. To be tested by closing the mouth to see if child breathes easily through nostrils.

(32) NASAL OBSTRUCTION. To be tested by closing each nostril in turn to see if child breathes easily through the open nostril.

(34) TONSILS.<sup>8</sup> "Rem." means removed; "Enlarged" indicates moderate enlargement; "Greatly enlarged" are those nearly filling the throat; "Diseased" tonsils are those showing (1) cheesy plugs, (2) localized injections of the surrounding vessels. All positive entries in Nos. 30 to 36, inclusive, are to be listed and referred to specialist for absolute diagnosis.

(35) OTHER ABNORMALITIES. Here may be noted any malformations such as harelip, cleft palate, bifid uvula, etc. All abnormal conditions of the nasopharynx to be listed and referred to the specialist for absolute diagnosis.

## GLANDS.

(37) "ENLARGED" glands are those over  $\frac{1}{4}$  inch in diameter; "Greatly enlarged" glands are those 1 inch in diameter or over. In looking for the infection associated with enlarged glands, look among other causes for bites on the body and if present, examine clothing for pediculosis and the head for nits.

(37-g) OTHER—SPECIFY. Includes thyroid, etc.

## HEART.

(38) HEART. Enlargement to be determined by axillary border and apex beat if latter is below the fourth or fifth interspace and outside the mammary line.

## LUNGS.

Percuss the paravertebral regions and listen with the stethoscope over the bases and the paravertebral regions.

(41) OTHER DEFECTS. Asymmetry, abnormal shape, poor development, etc.

<sup>7</sup> For details of hearing testing, see page 24.

<sup>8</sup> For details on indications for recommending removal of tonsils and adenoids, see page 50.

## SKIN.

(51) OTHER CONDITIONS. May be included general condition of the skin such as cleanliness, rough, dry, clammy; also birthmarks, furunculosis, urticaria, etc.

## ABDOMEN.

(54) LIVER. Is "enlarged" if more than 1 inch below border of ribs. Specify in inches.

(55) SPLÉEN. Is "enlarged" if palpable; "moderately enlarged" if 1 inch below border of ribs; "greatly enlarged" if felt as tumor mass in abdomen.

(57) OTHER DEFECTS. Note should be made of distension due to tympanites as in rickets, or ascites, etc., and measurements taken at a level of the umbilicus, if greatly enlarged from any cause.

## BONY AND MUSCULAR SYSTEM.

(68) FLAT-FOOT. Child to be examined standing in stocking feet or barefoot, and height of arch recorded in inches. This is to be measured with ruler held perpendicularly from floor to tubercle of scaphoid bone, which is the top of the arch. Observe child's walking and record position of feet, i. e., toes straight ahead, toes in, toes out.

(71) ARTHRITIS. If present, try to get a history of previous infections.

(73) OTHER DEFECTS. Note flabbiness of muscles, clubbed fingers, tuberculous bone affections, etc. Record here also in every case whether or not pronation of feet is present, i. e., rotation of the axis of the foot.

## NERVOUS SYSTEM.

(77) OTHER DEFECTS. Note to be made of extreme nervousness, etc.

MENTAL CONDITION. Note to be made of sluggish or active mentality and confer with teacher if questionable.

## LABORATORY FINDINGS.

In this space may be recorded results of urinalysis, cultures or smears, from reports furnished by the Gary Board of Health laboratory.

## PREVIOUS ILLNESS.

This information may be obtained only in case the mother accompanies the child and can make apparently reliable statements.

(83-d) OTHER. General diseases such as rheumatism, malaria, intestinal parasites, etc.

## BAD HABITS.

(84) Such as finger sucking, masturbation, nail biting, perverted appetites, enuresis, etc. Information probably can be obtained only from mother or teacher.

## SUMMARY OF DEFECTS AND DISEASES.

To include all checked defects found in general examination.

## RECOMMENDATIONS.

These are to be such as will correct or improve defects found by referring to specialists—correction of habits, dietary and general hygienic advice.

## MEASURING AND WEIGHING.

In an attempt to secure accurate figures on standing height and nude weight, these measurements were taken largely by one specially instructed person in order to eliminate, so far as possible, personal variations. Each measurement was made twice, once before the physical examination and once after, the second figure serving as a check on the previous one.

**Height.**

The measuring apparatus consisted of two pieces as follows: (1) A blue-print paper measuring scale.<sup>9</sup> The scale was prepared from a standardized meter stick secured from the United States Bureau of Standards, a draftsman making the tracing from which blue prints could be obtained. The strips of paper were 72 inches long and 3 inches wide, with a scale divided into  $\frac{1}{8}$ -inch units. The inch lines extended across the paper and the half-inch lines were  $\frac{1}{2}$  inch in length. The strips were pasted on a smooth pine board which could be attached perpendicularly to the floor, thus insuring a standard position which is impossible in the ordinary room due to wainscoting and sheathing. For the examination of infants too young to stand, the measuring strip was pasted directly on the examination table, and a board 4 by 6 inches was fastened perpendicularly to the end of the table for a headrest. (2) Square. This second essential part of the measuring apparatus was a plane to slide down over the measuring scale, when reading the height. It consisted of two pieces of wood, each 6 inches long, 4 inches broad, and  $\frac{1}{2}$  inch thick, fastened together at a right angle. A crossbar on the inside served as a handle and further strengthened the apparatus, which simulated a book end with a crossbar.

The measurement of standing height was made by having the child stand erect, arms hanging naturally at sides, heels together, back and the back of the head (the eyes in a horizontal plane) against the board to which the measuring scale was attached. The "book end," as the square was sometimes called, was brought down firmly on the top of the head and the reading taken. The 4-inch width of

<sup>9</sup> This type of scale was prepared after consultation with Dr. A. Hrdlicka, anthropologist of the Smithsonian Institution.

the measuring apparatus was a definite advantage in that the inch lines across the printed scale insured an accurate horizontal position of the square because it must not only touch the top of the head firmly but also be parallel to the longer lines across the scale.

The reclining length of infants was taken by pushing the square firmly against the soles of the feet, which were held at right angles to the table.

### Weight.

For weighing children who could stand, an upright beam scale was used. Infants were weighed on a grocer's scoop scale with a very heavy base, to which the scoop was securely riveted.

All weights were taken without clothes. The flannelette square used as a protection for the child as he came from the dressing room was removed and held in front of him by the mother or nurse as a screen while the weight was taken. So far as possible, the weighing was done by one nurse who had been specially instructed in the importance of accuracy in adjusting the balance of the scale several times daily and reading the record of weight with the beam horizontal or at mid-balance. After the physical examination the child was reweighed, and the second reading was checked up with the original figures before entry was made on the record form.

The height and weight table used as a standard was that prepared by the Children's Bureau for the weighing and measuring test during the Children's Year campaign, the averages for children at birth and for boys at 3 months having been taken from Dr. L. Emmett Holt's figures from original observation; those for children aged 6 to 48 months, from the anthropometric table compiled by F. S. Crum; and those for children aged 5 to 7 years, inclusive, from Bowditch. Since all the children included in this study were weighed without clothing and the Bowditch figures included weight of clothing, it was necessary to deduct from the latter the average weight of clothes (Bowditch's averages.)<sup>10</sup>

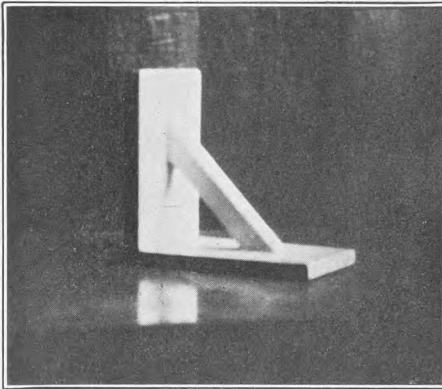
In order to economize time as well as to eliminate possible errors through hasty computation, this table was adapted for the use of the examining physicians, weights being shown in half-year periods, decimal or fractional pounds being changed to ounces and decimal inches to fractional inches. Weights 10 per cent below the accepted averages were also computed and arranged in a column parallel to the corresponding averages. The saving of time, the elimination of the possible chances of mathematical error, and the uniformity of method made possible are obvious. The adapted table is here given, since it offers some practical suggestions, although its form could be more conveniently arranged.

<sup>10</sup> See *The Diseases of Infancy and Childhood*, by L. Emmett Holt, M. D., p. 19. New York, 1916.

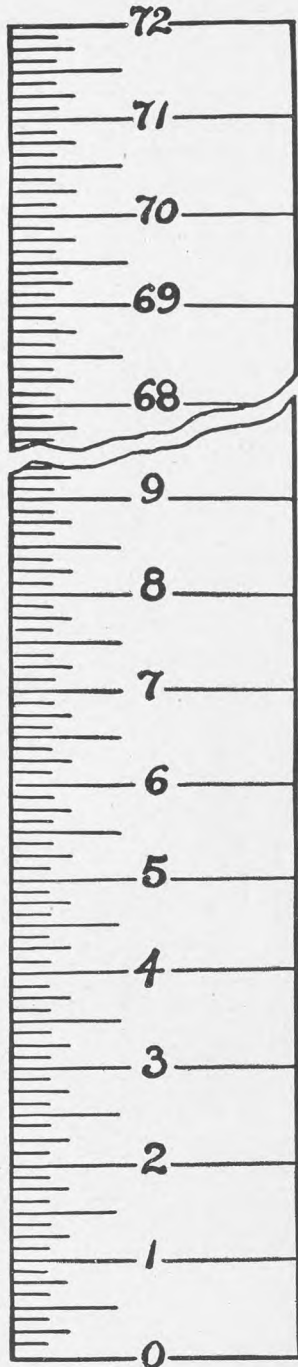




MEASURING.



MEASURING SQUARE.



MEASURING STRIP.

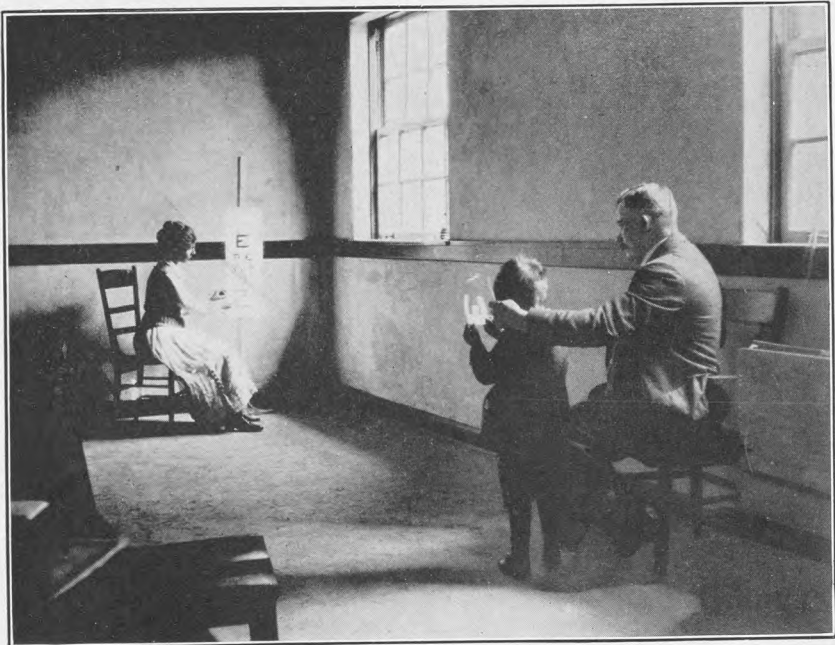
Scale  $\frac{1}{2}$  inch equals 1 inch.



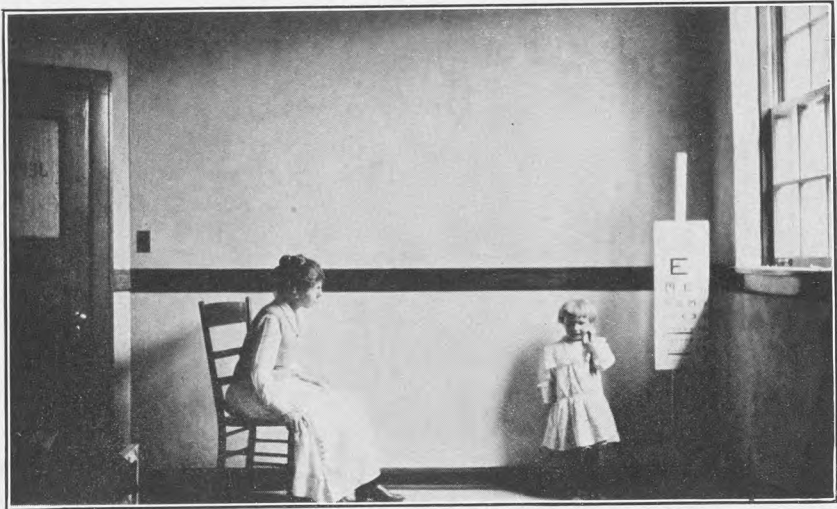
WEIGHING IN SCOOP SCALE.



WEIGHING ON BEAM SCALE.



VISION TESTING.



HEARING TESTING.

Heights and weights of boys.

Heights and weights of girls.

Age.	Height.	Weight.		Age.	Height.	Weight.	
		10 per cent below average.	Average.			10 per cent below average.	Average.
	Inches.	Lbs. Oz.	Lbs. Oz.		Inches.	Lbs. Oz.	Lbs. Oz.
Birth.....	20 <sup>3</sup> / <sub>8</sub>	6 13	7 9	Birth.....	20 <sup>1</sup> / <sub>2</sub>	6 8	7 3
3 months.....	23 <sup>1</sup> / <sub>2</sub>	11 11	13	3 months.....	25 <sup>1</sup> / <sub>2</sub>	15 1	16 12
6 months.....	26 <sup>1</sup> / <sub>2</sub>	16 3	18	6 months.....	26 <sup>1</sup> / <sub>2</sub>	15 10	17 6
7 months.....	27 <sup>1</sup> / <sub>2</sub>	17 3	19 2	7 months.....	27	16 7	18 4
8 months.....	27 <sup>3</sup> / <sub>8</sub>	17 12	19 12	8 months.....	27 <sup>1</sup> / <sub>2</sub>	17 3	19 2
9 months.....	28 <sup>1</sup> / <sub>2</sub>	18 5	20 6	9 months.....	27 <sup>3</sup> / <sub>8</sub>	17 9	19 8
10 months.....	28 <sup>3</sup> / <sub>8</sub>	18 13	20 14	10 months.....	28 <sup>1</sup> / <sub>2</sub>	18 2	20 2
11 months.....	29	19 4	21 6	11 months.....	28 <sup>3</sup> / <sub>8</sub>	18 11	20 12
12 months.....	29 <sup>3</sup> / <sub>8</sub>	19 11	21 14	12 months.....	29 <sup>3</sup> / <sub>8</sub>	18 14	21
13 months.....	29 <sup>7</sup> / <sub>8</sub>	20 9	22 14	13 months.....	29 <sup>1</sup> / <sub>2</sub>	19 7	21 10
14 months.....	30 <sup>1</sup> / <sub>2</sub>	20 11	23	14 months.....	30	19 11	21 14
15 months.....	30 <sup>3</sup> / <sub>8</sub>	21 4	23 10	15 months.....	30 <sup>1</sup> / <sub>2</sub>	20 6	22 10
16 months.....	31	21 11	24 2	16 months.....	30 <sup>3</sup> / <sub>8</sub>	20 9	22 14
17 months.....	31 <sup>1</sup> / <sub>2</sub>	22 1	24 8	17 months.....	31	21 1	23 6
18 months.....	31 <sup>3</sup> / <sub>8</sub>	22 3	24 10	18 months.....	31 <sup>1</sup> / <sub>2</sub>	21 6	23 12
19 months.....	32	22 15	25 8	19 months.....	32	21 11	24 2
20 months.....	32 <sup>1</sup> / <sub>2</sub>	23 3	25 12	20 months.....	32 <sup>1</sup> / <sub>2</sub>	22 4	24 12
21 months.....	32 <sup>3</sup> / <sub>8</sub>	23 3	25 12	21 months.....	32	22 12	25 4
22 months.....	33	24 3	26 14	22 months.....	32 <sup>3</sup> / <sub>8</sub>	23 1	25 10
23 months.....	33 <sup>1</sup> / <sub>2</sub>	24 5	27	23 months.....	32 <sup>7</sup> / <sub>8</sub>	23 12	26 6
24 months.....	33 <sup>3</sup> / <sub>8</sub>	24 7	27 2	24 months.....	33 <sup>1</sup> / <sub>2</sub>	24 3	26 14
25 months.....	34	25 1	27 14	25 months.....	33 <sup>3</sup> / <sub>8</sub>	24 8	27 4
26 months.....	34 <sup>1</sup> / <sub>2</sub>	25 7	28 4	26 months.....	33 <sup>7</sup> / <sub>8</sub>	24 8	27 4
27 months.....	34 <sup>3</sup> / <sub>8</sub>	26 2	29	27 months.....	34 <sup>1</sup> / <sub>2</sub>	25	27 12
28 months.....	35	26 3	29 2	28 months.....	34 <sup>3</sup> / <sub>8</sub>	25 7	28 4
29 months.....	35 <sup>1</sup> / <sub>2</sub>	26 5	29 4	29 months.....	34 <sup>7</sup> / <sub>8</sub>	25 14	28 12
30 months.....	35 <sup>3</sup> / <sub>8</sub>	26 9	29 8	30 months.....	35	26 2	29 2
31 months.....	35 <sup>7</sup> / <sub>8</sub>	27 7	30 8	31 months.....	35 <sup>1</sup> / <sub>2</sub>	26 3	29 2
32 months.....	36	27 9	30 10	32 months.....	35 <sup>3</sup> / <sub>8</sub>	27 2	30 2
33 months.....	36 <sup>1</sup> / <sub>2</sub>	27 9	30 10	33 months.....	36	27 4	30 4
34 months.....	36 <sup>3</sup> / <sub>8</sub>	28	31 2	34 months.....	36 <sup>1</sup> / <sub>2</sub>	27 7	30 8
35 months.....	36 <sup>5</sup> / <sub>8</sub>	28 11	31 14	35 months.....	36 <sup>3</sup> / <sub>8</sub>	27 11	30 12
36 months.....	37 <sup>1</sup> / <sub>2</sub>	29	32 4	36 months.....	37	27 14	31
37 months.....	37 <sup>3</sup> / <sub>8</sub>	29	32 4	37 months.....	37 <sup>1</sup> / <sub>2</sub>	28 7	31 10
38 months.....	37 <sup>5</sup> / <sub>8</sub>	29 2	32 6	38 months.....	37 <sup>3</sup> / <sub>8</sub>	28 13	32
39 months.....	37 <sup>7</sup> / <sub>8</sub>	29 13	33 2	39 months.....	38	29 4	32 4
40 months.....	38 <sup>1</sup> / <sub>2</sub>	30 2	33 8	40 months.....	38 <sup>1</sup> / <sub>2</sub>	29 8	32 12
41 months.....	38 <sup>3</sup> / <sub>8</sub>	30 4	33 10	41 months.....	38 <sup>3</sup> / <sub>8</sub>	29 11	33
42 months.....	38 <sup>5</sup> / <sub>8</sub>	30 6	33 12	42 months.....	38 <sup>5</sup> / <sub>8</sub>	29 15	33 4
43 months.....	38 <sup>7</sup> / <sub>8</sub>	30 6	33 12	43 months.....	39	30 2	33 8
44 months.....	38 <sup>7</sup> / <sub>8</sub>	30 13	34 4	44 months.....	39 <sup>1</sup> / <sub>2</sub>	30 2	33 8
45 months.....	39	31 1	34 8	45 months.....	39 <sup>3</sup> / <sub>8</sub>	30 6	33 12
46 months.....	39	31 4	34 12	46 months.....	40	31 13	35 6
47 months.....	39 <sup>1</sup> / <sub>2</sub>	32 3	35 12	47 months.....	41	33 3	36 14
48 months.....	39 <sup>3</sup> / <sub>8</sub>	32 5	35 14	48 months.....	42	34 13	38 11
4½ years.....	40 <sup>1</sup> / <sub>2</sub>	33 6	37 1	4½ years.....	43	36 7	40 8
5 years.....	41 <sup>1</sup> / <sub>2</sub>	34 7	38 4	5 years.....	44	38	42 4
5½ years.....	42 <sup>1</sup> / <sub>2</sub>	36 5	40 6	5½ years.....	45 <sup>1</sup> / <sub>2</sub>	39 8	44
6 years.....	43 <sup>1</sup> / <sub>2</sub>	38 2	42 6	6 years.....	46	41 10	46 4
6½ years.....	44 <sup>1</sup> / <sub>2</sub>	39 10	44	6½ years.....	46 <sup>1</sup> / <sub>2</sub>	43 8	48 8
7 years.....	45 <sup>1</sup> / <sub>2</sub>	41	45 9	7 years.....	47	45 15	51 1
7½ years.....	46 <sup>1</sup> / <sub>2</sub>	43 3	48	7½ years.....	48	48 3	53 9
8 years.....	47 <sup>1</sup> / <sub>2</sub>	45 5	50 6	8 years.....	49	50 3	55 12
8½ years.....	48 <sup>1</sup> / <sub>2</sub>	47 12	53 1	8½ years.....	50	52 1	57 14
9 years.....	49 <sup>1</sup> / <sub>2</sub>	50 2	55 11	9 years.....	51		
9½ years.....	50 <sup>1</sup> / <sub>2</sub>	51 15	57 11	9½ years.....			
10 years.....	51 <sup>1</sup> / <sub>2</sub>	53 10	59 9	10 years.....			

VISION TESTING.

The "illiterate" chart was the one used for testing the vision of these children, most of whom were too young to know the alphabet. This chart consists of eight rows of letter E's, gradually diminishing in size and turned in four different positions. The child was given a

pasteboard letter **E** and instructed how to turn it to correspond to the position of the particular letter in the chart at which the nurse pointed. The child's own fingers could also be used to indicate the position of the fingers of the **E**. At the side of each row of letters there was a number which indicated the distance in feet at which the letter should be read by a normal eye. The large letter at the top should be read at a distance of 200 feet; the other rows at 100, 65, 50, 39, 25, 20, and 15 feet.

The child was placed at a distance of 20 feet from the chart. If he could then turn his letter correctly to correspond to the letters on the 20-foot line, he was given a grade of  $\frac{20}{20}$ . If he could not see that line but could see the large line above, he was given a grade of  $\frac{20}{25}$ , the numerator of the fraction being always the distance between the chart and the child, and the denominator indicating the line which the child could see. A child who received a grade of  $\frac{20}{30}$  saw only two-thirds of what he should see; one who received  $\frac{20}{50}$  saw only two-fifths of what he should see. Every child whose vision grade was  $\frac{20}{30}$  or less was referred to an eye specialist. If a child's vision was so poor that at a distance of 20 feet from the chart he could not see the top letter, which should have been visible at 200 feet, he was moved toward the chart until he could see it, and the distance between him and the chart was then measured. For instance, a child might receive a grade of  $\frac{100}{200}$ . Vision graded  $\frac{20}{25}$  was considered "slightly defective" and not necessarily requiring glasses, but when a child received such a grade the mother was advised to keep his vision under observation; vision graded  $\frac{20}{30}$  or worse was tabulated as "seriously defective" and requiring glasses.

Important details to be observed in testing vision by this method are:

1. Have the child stand 20 feet away from the chart.
2. Always test the right eye first.
3. Use a card to cover one eye while testing the other, being careful not to press on the covered eye.
4. Use a bright-colored pointer, such as a red penholder.
5. Do not point to the same letter consecutively, since that tends to puzzle the child.
6. Place the pointer directly under the letter, being careful not to touch the letter at any point.
7. Do not spend a great length of time on the larger letters. If you are convinced that the child sees them readily, pass on to the lower lines before the child grows tired or loses interest.
8. Always try the letters which are easiest for the child to see, and if the light is better on one side of the chart, as for instance when a lamp is used, point to the brightest letters.

#### HEARING TESTING.

In the hearing test the child stood 20 feet away from the nurse who made the examinations, with his head turned so that his right ear was toward her and with his finger in his left ear. The "whispered

voice" was used—simple numbers and phrases whispered on the exhalation of a breath, 66 or any other number ending in 6 being avoided. After the right ear was tested the child was faced about and the left ear was tested in the same manner. The repetition of the number or phrase heard indicated the child's ability to hear. The advantage of having the same person conduct all the hearing tests is self-evident, since individual variations in pitch of voice, enunciation, etc., in a number of examiners might result in uneven grading.

A child standing 20 feet away from the nurse and repeating correctly the whispered words, received a grade of  $\frac{20}{20}$ . If the child had defective hearing, the nurse advanced slowly toward him until he could hear what she was saying. The grade was then determined by measuring the distance between the child and the nurse. For instance, a child might receive a grade of  $\frac{5}{20}$ . All cases of defective hearing were referred to a specialist. In the tabulations, hearing was entered as "slightly defective" if the grade was between  $\frac{10}{20}$  and  $\frac{15}{20}$ , and "seriously defective" if it was less than  $\frac{15}{20}$ .

#### INDICATIONS FOR RECOMMENDING REMOVAL OF TONSILS AND ADENOIDS.

A difficult point in the consideration of naso-pharyngeal defects in children is the decision as to what cases shall be listed as having enlarged tonsils and adenoids. The fact that standards for determining this have varied greatly among different examiners is proved by the greatly varying percentages of this defect recorded by different medical school inspectors. Specialists differ greatly in their estimate of what are enlarged tonsils and what forms an indication for their removal. This obvious difference in standards is largely due to the fact that hyperplasia of lymphoid tissue is physiological in young children, and that normal tonsils are proportionately larger in children than in adults.

In this study it was, in the first place, found necessary for statistical purposes to determine definite standards for making the entries on the record form; it was also necessary that each of the symptoms present be definitely outlined before removal of tonsils was recommended. From the standards which follow it is evident that a very conservative point of view was taken in making recommendations for removal of tonsils or adenoids.

Difficulties, of course, arise in deciding whether removal of tonsils and adenoids is indicated, when examining a group of children from many of whom no history can be obtained. The history of previous attacks of tonsillitis, and of habitual mouth breathing and snoring at night, are important factors in making the decision. In doubtful cases where no history could be obtained, no recommendation for

removal of tonsils and adenoids was made; but it was recommended that the child be examined again by a throat specialist, and the throat conditions watched.

The following was the basis on which recommendations were made for the removal of (1) tonsils, (2) adenoids, or (3) tonsils and adenoids.

1. Indications for removal of tonsils:

- (a) Greatly enlarged tonsils, practically filling the throat and making breathing difficult; or
- (b) Moderately enlarged tonsils with repeated attacks of tonsillitis, four or five a year; or
- (c) Moderately enlarged tonsils with a severe systemic infection, such as heart, joints, etc.; or
- (d) Greatly enlarged submaxillary glands, together with moderately enlarged tonsils.
- (e) Diseased tonsils; i. e., showing cheesy plugs.

Where moderately enlarged tonsils were found but the above positive indications were not present, no recommendations for removal were made.

2. Indications for removal of adenoids:

- (a) Marked mouth breathing with adenoid facies, in absence of other causes of nasal obstruction.
- (b) History of habitual snoring and mouth breathing at night (only to be obtained where the mother was present at the examination).
- (c) Chronic nasal discharge with marked excoriation of the lip (simple colds excluded).
- (d) Marked retraction of the ear drums.
- (e) Soft palate standing off from the posterior wall of the pharynx.

3. Indications for removal of tonsils and adenoids:

The indications here would be a combination of those of (1) and (2).

A digital examination for adenoids was not undertaken in making these examinations, as it was not considered feasible. In all cases where a child was examined to see whether an operation for the removal of tonsils and adenoids was indicated, or whether the case should merely be watched, an examination of the drum membrane was made.

Mouth breathing not of marked degree (i. e., that which has not caused any facial deformity and that of a child who breathes through his nose during the examination, even though he has been observed to breathe through his mouth when not self-conscious) was not considered an indication for removal of adenoids. The recommendation in these cases was that the child be watched and that a specialist be consulted again if the mouth breathing continued.



## PHYSICAL FINDINGS.

### INTRODUCTION.

The term "preschool," while literally referring to the years of life prior to school attendance, necessarily applies to a period of variable length, inasmuch as school entrance ages in different sections of the country range from 5 to 8 years. Clinically, early childhood has long been divided into two periods, viz., infancy, the first two years of life, and the preschool age, from 2 to 6 or 7 years. In this study the term "preschool" covered the period 2 to 6 years inclusive.<sup>11</sup>

A very considerable proportion, about 50 per cent, of all the children of preschool age in Gary were given physical examinations. The proportions of different ages who had physical examinations varied from approximately one-third of the children 3 years of age to about two-thirds of the 6-year-old children.

Nearly one-half (1,544) of the 3,125 children of this group given physical examinations were attending kindergarten or primary grades, and the examinations were made in their respective schools. The remaining 1,581 children were attendants at the health conferences.<sup>12</sup>

A singularly even distribution by sex is noticed in the entire group as well as at each age.

TABLE I.—*Age and sex; children from 2 to 7 years of age given physical examination.*

Age.	Both sexes.	Boys.	Girls.
All ages.....	3, 125	1, 555	1, 570
2 years, under 3.....	511	261	250
3 years, under 4.....	496	251	245
4 years, under 5.....	549	274	275
5 years, under 6.....	667	337	330
6 years, under 7.....	682	334	348
7 years, under 8.....	220	98	122

To what extent the social and economic environment of these children affected their physical condition would be difficult to determine; but a consideration of the nationality and income of parents in relation to physical conditions offers interesting data.

<sup>11</sup> For explanation of inclusion see Note 1, page 12.

<sup>12</sup> See page 11.

Children of foreign-born white mothers constituted 60.7 per cent of the children in this study. The principal nationalities represented were Serbo-Croatian, Slovak, Polish, Magyar, Italian, German, and Lithuanian. (See General Table 10, p. 72.)

Family incomes were tabulated in groups ranging from those below \$650 to those of \$2,250 and over. Practically two-thirds of all the children of foreign-born white parentage belonged to the lower income groups, i. e., those under \$1,450. (See General Table 12, p. 73.)

#### FINDINGS IN GENERAL.

Table II gives an enumeration of the kinds of defects found and their distribution according to sex. The boys on the whole showed a slightly higher percentage having defects than the girls, 96.9 compared with 93.6. The large proportion of boys with genetal defects (47.1 per cent) unquestionably accounts largely for this variation between the sexes, although dominance in defects of the nasopharynx, bony and muscular systems, and glands also helped to swell the higher percentage for boys.

TABLE II.—Prevalence of defects, by sex; children 2 to 7 years of age given physical examination.

Disease or defect.	Both sexes.		Boys.		Girls.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Total.....	3,125	100.0	1,555	100.0	1,570	100.0
Without defects.....	149	4.8	48	3.1	101	6.4
With disease or defect.....	2,976	95.2	1,507	96.9	1,469	93.6
General:						
Underweight (10 per cent and over).....	303	9.7	140	9.0	163	10.4
Anemia.....	243	7.8	113	7.3	130	8.3
Head.....	163	5.2	105	6.8	58	3.7
Abnormal shape.....	151	4.8	102	6.6	49	3.1
Open fontanelle.....	13	.4	5	.3	8	.5
Craniotabes.....	2	.1	1	.1	1	.1
Eyes.....	1,890	28.5	437	28.1	453	28.9
Vision defective.....	738	<sup>2</sup> 36.1	355	<sup>2</sup> 35.6	383	<sup>2</sup> 36.6
Diseases and defects other than of vision.....	245	7.8	127	8.2	118	7.5
Conjunctivitis.....	78	2.5	42	2.7	36	2.3
Blepharitis.....	70	2.2	38	2.4	32	2.0
Stye.....	28	.9	16	1.0	12	.8
Corneal ulcer.....	1	( <sup>3</sup> )	1	.1	.....	.....
Ptosis.....	13	.4	7	.5	6	.4
Corneal opacities.....	11	.4	7	.5	4	.3
Strabismus.....	76	2.4	33	2.1	43	2.7
Ears.....	4,295	9.4	171	11.0	124	7.9
Hearing defective.....	25	<sup>5</sup> 1.4	14	<sup>6</sup> 1.6	11	<sup>5</sup> 1.2
Acute otorrhea.....	3	.1	2	.1	1	.1
Chronic otorrhea.....	22	.7	15	1.0	7	.4
Retracted ear drums.....	258	<sup>6</sup> 8.3	148	<sup>6</sup> 9.5	110	<sup>6</sup> 7.0
Mouth.....	2,091	66.9	1,043	67.1	1,048	66.8
Decayed teeth.....	2,021	64.7	1,007	64.8	1,014	64.6
Malocclusion.....	343	11.0	163	10.5	180	11.5
Gum abscess.....	101	3.2	53	3.4	48	3.1

<sup>1</sup> In 1,081 cases, vision was not tested; hence this number does not include all possible cases of defective vision.

<sup>2</sup> Per cent based on 2,044 cases tested, 998 boys and 1,046 girls.

<sup>3</sup> Less than one-tenth of 1 per cent.

<sup>4</sup> In 1,279 cases, hearing was not tested; hence this number does not include all possible cases of defective hearing.

<sup>5</sup> Per cent based on 1,846 cases tested, 901 boys and 945 girls.

<sup>6</sup> A minimum statement—not all children were examined for this defect.

TABLE II.—Prevalence of defects, by sex; children 2 to 7 years of age given physical examination—Concluded.

Disease or defects.	Both sexes.		Boys.		Girls.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
With disease or defect—Continued.						
Naso-pharynx.	2,157	69.0	1,118	71.9	1,039	66.2
Defective tonsils.	1,626	52.0	836	53.8	790	50.3
Adenoids (definite)	1,050	33.6	570	36.7	480	30.6
Adenoids suspected.	207	6.6	106	6.8	101	6.4
Mouth breathing.	1,232	39.4	670	43.1	562	35.8
Nasal discharge.	299	9.6	157	10.1	142	9.0
High-arch palate.	1,027	32.9	535	34.4	492	31.3
Nasal obstruction.	1,194	38.2	651	41.9	543	34.6
Glands:						
Enlarged or greatly enlarged.	908	29.1	489	31.4	419	26.7
Occipital glands.	2	.1	1	.1	1	.1
Submaxillary glands.	704	22.5	383	24.6	321	20.4
Cervical glands.	241	7.7	143	9.2	98	6.2
Axillary glands.	15	.5	12	.8	3	.2
Inguinal glands.	51	1.6	38	2.4	13	.8
Thyroid glands.	60	1.9	21	1.4	39	2.5
Heart.	99	3.2	48	3.1	51	3.2
Heart disease.	14	.4	9	.6	5	.3
Questionable heart disease.	85	2.7	39	2.5	46	2.9
Lungs.	32	1.0	21	1.4	11	.7
Lung disease.	11	.4	6	.4	5	.3
Questionable lung disease.	21	.7	15	1.0	6	.4
Skin.	318	10.2	137	8.8	181	11.5
Eczema.	80	2.6	49	3.2	31	2.0
Acne.	1	( <sup>1</sup> )	1	.1	—	—
Pediculosis.	145	4.6	35	2.3	110	7.0
Impetigo.	8	.3	3	.2	5	.3
Infected sores.	67	2.1	35	2.3	32	2.0
Ringworm.	29	.9	18	1.2	11	.7
Scabies.	9	.3	5	.3	4	.3
Scars.	165	5.3	97	6.2	68	4.3
Abdomen.	464	14.8	234	15.0	230	14.6
Distended abdomen.	423	13.5	214	13.8	209	13.3
Enlarged liver.	11	.4	5	.3	6	.4
Hernia.	47	1.5	24	1.5	23	1.5
Bony and muscular system.	1,308	41.9	709	45.6	599	38.2
Beaded ribs.	31	1.0	15	1.0	16	1.0
Pigeon breast.	53	1.7	38	2.4	15	1.0
Harrison's groove.	175	5.6	112	7.2	63	4.0
Enlarged epiphyses.	209	6.7	146	9.4	63	4.0
Round shoulders.	103	3.3	62	4.0	41	2.6
Winged scapulae.	452	14.5	238	15.3	214	13.6
Scoliosis.	57	1.8	27	1.7	30	1.9
Lordosis.	16	.5	10	.6	6	.4
Kyphosis.	1	( <sup>1</sup> )	1	.1	—	—
Knock-knee.	194	6.2	92	5.9	102	6.5
Bowlegs.	300	9.6	193	12.4	107	6.8
Clubfeet.	4	.1	3	.2	1	.1
Arthritis.	3	.1	2	.1	1	.1
Paralysis.	5	.2	4	.3	1	.1
Nervous system.	75	2.4	42	2.7	33	2.1
Speech defect.	54	1.7	28	1.8	26	1.7
Tic.	8	.3	5	.3	3	.2
Chorea.	1	( <sup>1</sup> )	1	.1	—	—
Other nervous disease.	4	.1	3	.2	1	.1
Very nervous or restless.	12	.4	7	.5	5	.3
Mentality.	37	1.2	26	1.7	11	.7
Defect apparent.	19	.6	12	.8	7	.4
Defect suspected.	18	.6	14	.9	4	.3
Genitalia, male.	—	—	732	47.1	—	—
Prepuce defects.	—	—	719	46.2	—	—
Other defects.	—	—	22	1.4	—	—
Genitalia, female:	—	—	—	—	—	—
Vaginal discharge.	—	—	—	—	37	2.4

<sup>1</sup> Less than one-tenth of 1 per cent.

The actual number of children without physical defects was found to be only 4.8 per cent of those examined—149 out of 3,125. The girls, of whom 6.4 per cent were without defect, made a more fa-

avorable showing than the boys, with only 3.1 per cent free from defect.

Boys also had the larger number of defects per individual, 44.8 per cent having 5 or more, as compared with 31.2 per cent of the girls. The average number of defects per child, based on all those who had defects, was 4.2 for both sexes, 4.5 for boys, and 3.8 for girls. This average for the different age groups was as follows: For the 2-year-olds, 2.7; for the 3-year-olds, 3.1; and for the 4-, 5-, and 6-year-olds, 3.5, 4.8, and 5, respectively. The proportion with no defects decreased from 15.1 per cent at 2 years to 0.3 per cent at 6 years.

TABLE III.—Number of defects, by age and sex; children 2 to 7 years of age given physical examination.

Number of defects, and sex.	Total children.		2 years, under 3.		3 years, under 4.		4 years, under 5.		5 years, under 6.		6 years, under 7.		7 years, under 8.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.	3,125	100.0	511	100.0	496	100.0	549	100.0	667	100.0	682	100.0	220	100.0
With defects.	2,978	95.2	434	84.9	453	91.3	531	96.7	660	99.0	680	99.7	218	99.1
Less than 5.	1,789	57.2	373	73.0	361	72.8	352	64.1	324	48.6	286	41.9	93	42.3
1.	332	10.6	125	24.5	84	16.9	48	8.7	38	5.7	27	4.0	10	4.5
2.	440	14.1	116	22.7	111	22.4	70	12.8	66	9.9	60	8.8	17	7.7
3.	537	17.2	85	16.6	96	19.4	131	23.9	95	14.2	98	14.4	32	14.5
4.	480	15.4	47	9.2	70	14.1	103	18.8	125	18.7	101	14.8	34	15.5
5 to 9.	1,123	35.9	60	11.7	90	18.1	172	31.3	311	46.6	372	54.5	118	53.6
5.	426	13.6	31	6.1	56	11.3	59	10.7	124	18.6	122	17.9	34	15.5
6.	316	10.1	16	3.1	18	3.6	63	11.5	79	11.8	96	14.1	44	20.0
7.	196	6.3	6	1.2	9	1.8	32	5.8	47	7.0	84	12.3	18	8.2
8.	123	3.9	3	.6	4	.8	10	1.8	43	6.4	48	7.0	15	6.8
9.	62	2.0	4	.8	3	.6	8	1.5	18	2.7	22	3.2	7	3.2
10 to 15.	64	2.0	1	.2	2	.4	7	1.3	25	3.7	22	3.2	7	3.2
10.	30	1.0	1	.2	2	.4	1	.2	8	1.2	16	2.3	4	1.8
11.	21	.7	.....	.....	.....	.....	3	.5	13	1.9	1	.1	2	.9
12.	8	.3	.....	.....	.....	.....	2	.4	3	.4	3	.4	.....	.....
13.	3	.1	.....	.....	.....	.....	.....	.....	1	.1	.....	.3	.....	.....
14.	1	(1)	.....	.....	.....	.....	1	.2	.....	.....	.....	.....	1	.5
15.	1	(1)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.9
Without defects	149	4.8	77	15.1	43	8.7	18	3.3	7	1.0	2	.3	2	.9
Boys.	1,555	100.0	261	100.0	251	100.0	274	100.0	337	100.0	334	100.0	98	100.0
With defects.	1,507	96.9	235	90.0	237	94.4	269	98.2	335	99.4	333	99.7	98	100.0
Less than 5.	810	52.1	194	74.3	174	69.3	156	56.9	133	39.5	117	35.0	36	36.7
1.	136	8.7	57	21.8	32	12.7	17	6.2	15	4.5	9	2.7	6	6.1
2.	181	11.6	57	21.8	59	23.5	26	9.5	18	5.3	18	5.4	3	3.1
3.	242	15.6	45	17.2	44	17.5	61	22.3	39	11.6	40	12.0	13	13.3
4.	251	16.1	35	13.4	39	15.5	52	19.0	61	18.1	50	15.0	14	14.3
5 to 9.	652	41.9	41	15.7	61	24.3	108	39.4	184	54.6	202	60.5	56	57.1
5.	233	15.0	19	7.3	34	13.5	36	13.1	65	19.3	63	18.9	16	16.3
6.	184	11.8	12	4.6	16	6.4	36	13.1	49	14.5	47	14.1	24	24.5
7.	121	7.8	4	1.5	4	1.6	24	8.8	31	9.2	50	15.0	8	8.2
8.	74	4.8	2	.8	4	1.6	8	2.9	26	7.7	28	8.4	6	6.1
9.	40	2.6	4	1.5	3	1.2	4	1.5	13	3.9	14	4.2	2	2.0
10 to 15.	45	2.9	.....	.....	.....	.....	5	1.8	18	5.3	14	4.2	6	6.1
10.	21	1.4	.....	.....	.....	.....	1	.4	5	1.5	11	3.3	4	4.1
11.	15	1.0	.....	.....	2	.8	2	.7	10	3.0	.....	.....	1	1.0
12.	5	.3	.....	.....	.....	.....	1	.4	2	.6	2	.6	.....	.....
13.	2	.1	.....	.....	.....	.....	.....	.....	1	.3	1	.3	.....	.....
14.	1	.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15.	1	.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1.0
Without defects	48	3.1	26	10.0	14	5.6	5	1.8	2	.6	1	.3	.....	.....
Girls.	1,570	100.0	250	100.0	245	100.0	275	100.0	330	100.0	348	100.0	122	100.0

<sup>1</sup> Less than one-tenth of 1 per cent.

TABLE III.—Number of defects, by age and sex; children 2 to 7 years of age given physical examination—Concluded.

Number of defects, and sex.	Total children.		2 years, under 3.		3 years, under 4.		4 years, under 5.		5 years, under 6.		6 years, under 7.		7 years, under 8.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
With defects . . .	1,469	93.6	199	79.6	216	88.2	262	95.3	325	98.5	347	99.7	120	98.4
Less than 5.	979	62.4	179	71.6	187	76.3	196	71.3	191	57.9	169	48.6	57	46.7
1. . . . .	196	12.5	68	27.2	52	21.2	31	11.3	23	7.0	18	5.2	4	3.3
2. . . . .	259	16.5	59	23.6	52	21.2	44	16.0	48	14.5	42	12.1	14	11.5
3. . . . .	295	18.8	40	16.0	52	21.2	70	25.5	56	17.0	58	16.7	19	15.6
4. . . . .	229	14.6	12	4.8	31	12.7	51	18.5	64	19.4	51	14.7	20	16.4
5 to 9. . . . .	471	30.0	19	7.6	29	11.8	64	23.3	127	38.5	170	48.8	62	50.8
5. . . . .	193	12.3	12	4.8	22	9.0	23	8.4	59	17.9	59	17.0	18	14.8
6. . . . .	132	8.4	4	1.6	2	.8	27	9.8	30	9.1	49	14.1	20	16.4
7. . . . .	75	4.8	2	.8	5	2.0	8	2.9	16	4.8	34	9.8	10	8.2
8. . . . .	49	3.1	1	.4			2	.7	17	5.2	20	5.7	9	7.4
9. . . . .	22	1.4					4	1.5	5	1.5	8	2.3	5	4.1
10 to 15. . . . .	19	1.2	1	.4			7	2.1	7	2.1	8	2.3	1	.8
10. . . . .	9	.6	1	.4					3	.9	5	1.4		
11. . . . .	6	.4							3	.9	1	.3	1	.8
12. . . . .	3	.2					1	.4	1	.3	1	.3		
13. . . . .	1	.1					1	.4	1	.3	1	.3		
Without defects	101	6.4	51	20.4	29	11.8	13	4.7	5	1.5	1	.3	2	1.6

Correlations with nationality showed that children of foreign-born white parentage had slightly more defects than those of native white parentage.

The proportion without defect was higher among children of native white mothers than among those of the other nationality groups—6.8 per cent as compared with only 3.6 per cent among the children of foreign-born white mothers and 2.8 per cent among the colored children. Among the foreign nationalities represented in the study the Polish had the largest proportion without defects, 5.4 per cent, the Magyar came next with 4, then the Slovak with 3.5 per cent, the Italian with 3.2 per cent, the German with 2.9 per cent, the Lithuanian with 2.4 per cent, and the Serbo-Croatian with only 1.6 per cent free from defects. The average number of defects per individual child among the children who had one or more defects varied in a similar manner; it was lowest, 3.8, for the children of native white mothers, next for the children of foreign-born white mothers, averaging 4.3, and highest, 4.6, for the colored children. Among the foreign nationalities, the Polish had the best record, with only 3.8 defects to a child; the German were next, with 4.1; the Italian followed, with 4.3; the Slovak and Lithuanian, each with 4.4, the Serbo-Croatian, with 4.5; and the Magyar, with 4.6.

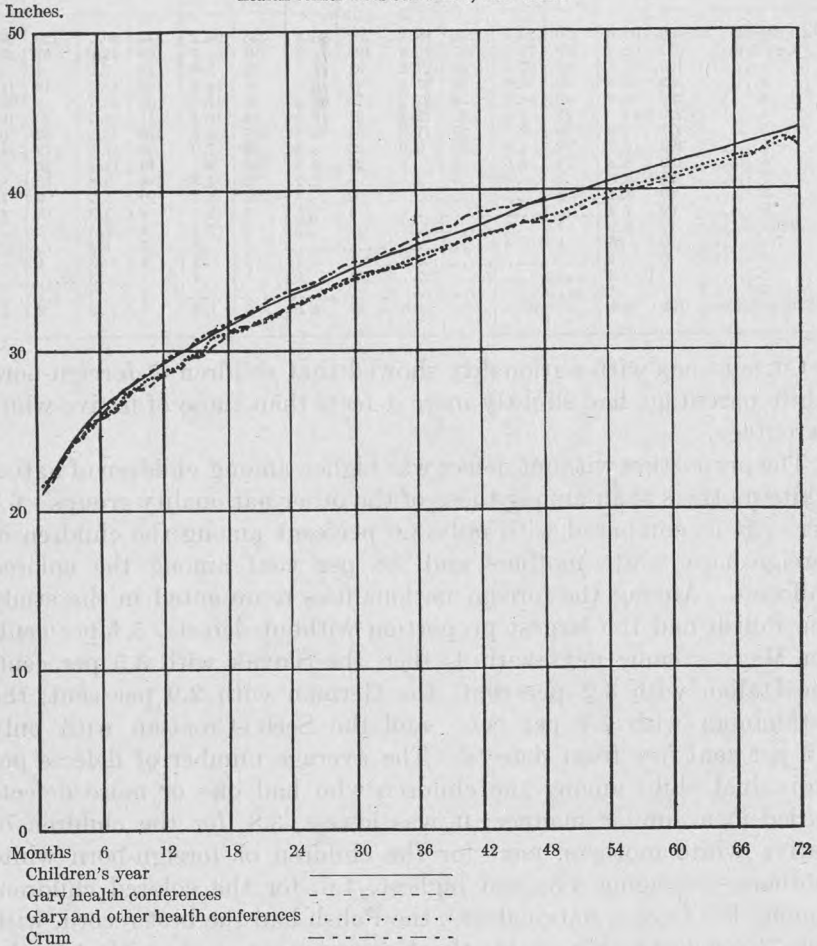
The proportion of children without defects varied also according to fathers' earnings. Thus in families where the fathers earned \$2,250 and over the percentage of children without defects was 6.6, as compared with a percentage of only 3.9 in families where the fathers earned less than \$1,050.

A discussion of the findings in detail follows, the items covered by the examination appearing in the same order as on the record form.

### HEIGHT AND WEIGHT.

The average heights and weights of Gary boys and girls 7 years of age and under, according to age, are recorded in Table IV. As has

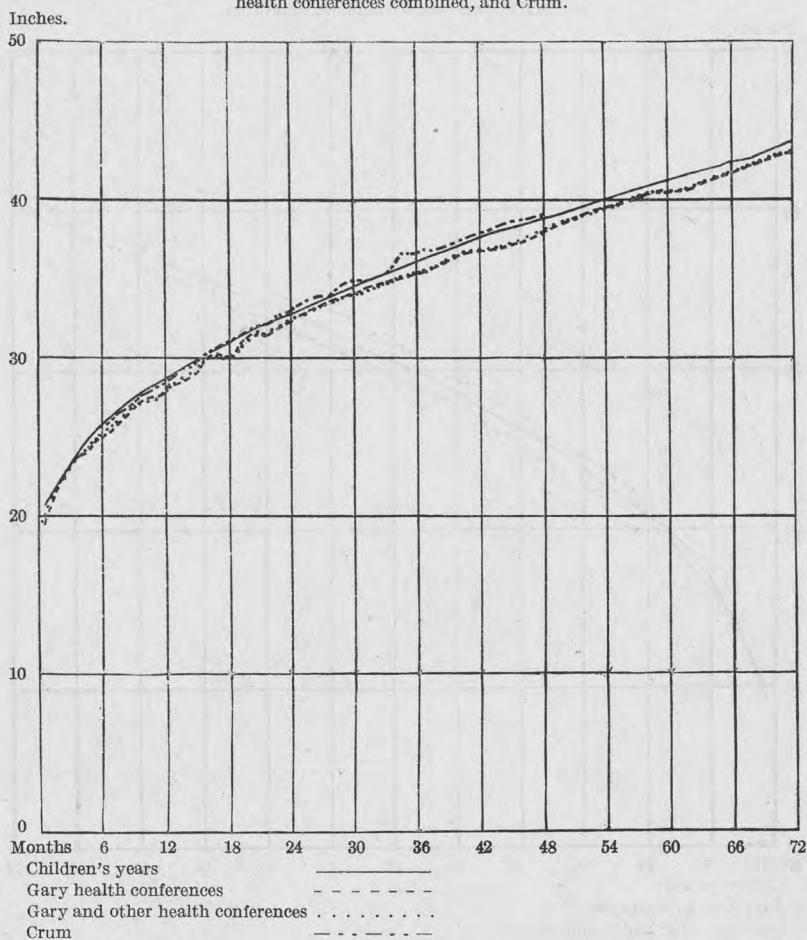
CHART I. Average heights of boys from birth to 6 years of age; Children's year, Gary, Gary and health conferences combined, and Crum.



already been stated, these figures represent the results of stripped examinations, in which measurements were made uniformly and were carefully verified. These figures are lower throughout than Crum's and Bowditch's, which were used as standards at the examinations, and also lower than the averages obtained from the figures submitted by doctors and nurses in all parts of the country during the Children's Year campaign.

In explanation of these differences it may be noted that Doctor Crum's figures were based upon children weighed and measured at baby health conferences and baby contests, in many of which prizes were given for the most perfect physical development. The children brought to these conferences and contests undoubtedly included many who were taller and heavier than the average. The Children's Year figures were based on a sample of slightly over 1 per cent of the

CHART II. Average height of girls from birth to 6 years of age; Children's year, Gary, Gary and health conferences combined, and Crum.

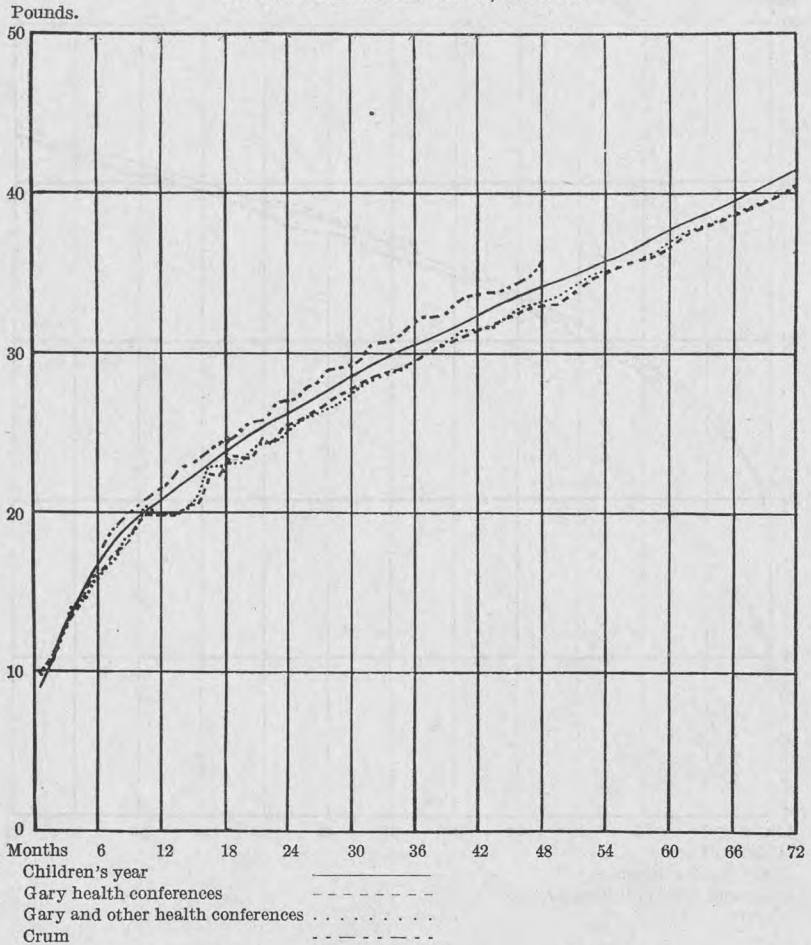


total number of children under 6 years of age in the country, who were weighed and measured in the course of the Children's Year weighing and measuring campaign. Though the campaign was designed to reach all classes of the population, the sample included in the tabulation may have been slightly biased, since the California children, who were found to be somewhat taller and heavier than

children in other parts of the country, were more largely represented in the group tabulated than in the total population under 6 years of age.

The Gary heights and weights, however, as already stated, were based upon a very large proportion of the children in the city under 6 years of age, and there was therefore less chance for these averages to be influenced by any biased selections.

CHART III. Average weights of boys from birth to 6 years of age; Children's year, Gary, Gary and health conferences combined, and Crum.

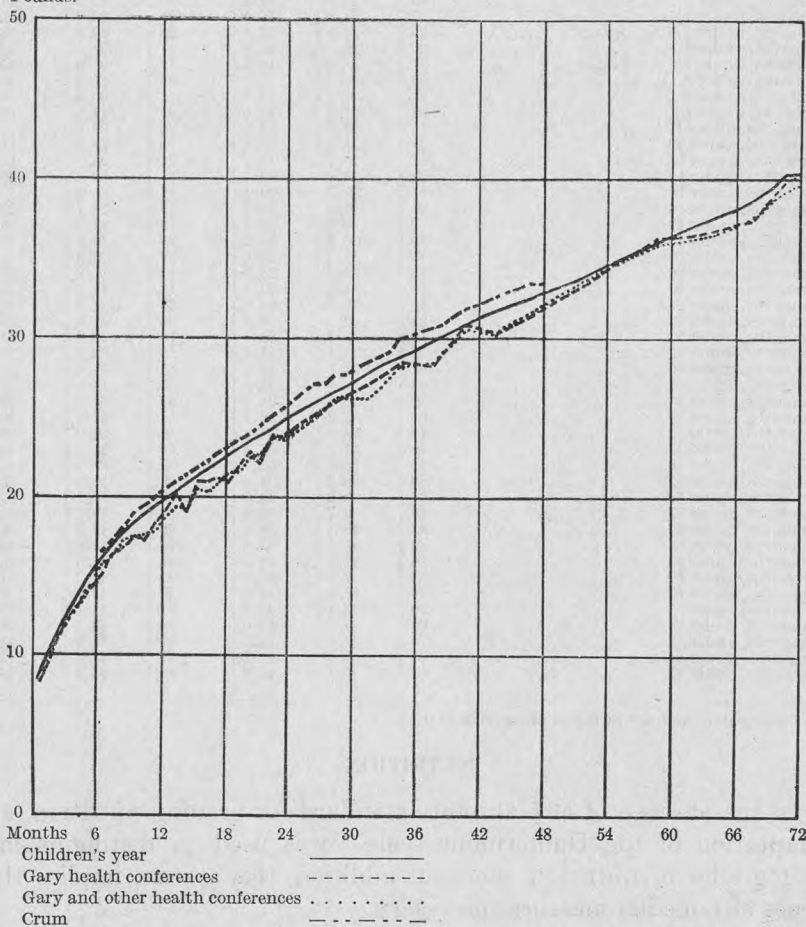


On the other hand, the Gary averages are for children in a group in which the nationality composition varies considerably from that in the country as a whole. About three-fifths of the children under 7 years of age in Gary had foreign-born mothers, as compared with only about one-fourth in the country as a whole. The principal foreign nationalities represented were the Slavic groups—including



Polish, Serbo-Croatian, and Slovak—and the Magyar, the Italian, and the German. Of these, the Italians are of markedly shorter stature than the British stocks which form the principal element in the native white population, and the Poles and Serbs are somewhat shorter, while the Germans are of very nearly the same stature as the British stocks.<sup>13</sup> The special nationality composition of the

CHART IV. Average weights of girls from birth to 6 years of age; Children's year, Gary, Gary and health conferences combined, and Crum.



Gary group of children may therefore account for the low average heights, and, since at these ages weight depends very largely upon height, it may account for the low average weights also.

<sup>13</sup> For statistics as to the average statures of adult males of these races, see The Medical Department of the United States Army in the World War, Vol. XV, Statistics, Part I, Army Anthropology, by Charles B. Davenport and Albert G. Love, pp. 47, 113. Washington, 1921.

TABLE IV.—Average heights and weights, by sex and age; white children 7 years of age and under given physical examination.<sup>1</sup>

Age.	Boys.			Girls.		
	Number.	Average height (inches).	Average weight (pounds).	Number.	Average height (inches).	Average weight (pounds).
Under 1 month.....	3	21.3	10.0	5	19.4	8.3
1 month, under 2.....	10	21.9	10.8	18	21.3	9.5
2 months, under 3.....	22	23.3	12.3	16	22.8	11.3
3 months, under 4.....	22	24.3	13.5	25	23.7	12.6
4 months, under 5.....	25	24.8	14.3	20	23.9	13.3
5 months, under 6.....	29	25.7	15.9	17	24.8	14.1
6 months, under 7.....	31	25.9	16.3	19	25.0	14.8
7 months, under 8.....	30	26.4	17.3	29	25.9	16.2
8 months, under 9.....	20	27.0	17.8	13	26.3	16.7
9 months, under 10.....	22	27.7	19.0	23	27.1	17.4
10 months, under 11.....	15	27.7	19.9	28	27.4	17.1
11 months, under 12.....	28	28.4	19.8	18	27.3	18.2
12 months, under 13.....	31	28.7	19.8	24	28.3	18.8
13 months, under 14.....	24	28.8	19.7	14	28.4	20.3
14 months, under 15.....	15	29.7	20.4	17	28.8	18.8
15 months, under 16.....	24	29.5	20.5	15	29.7	20.9
16 months, under 17.....	9	30.3	22.3	18	30.3	20.9
17 months, under 18.....	19	30.8	22.2	25	30.0	21.1
18 months, under 19.....	16	31.5	23.6	22	30.2	20.9
19 months, under 20.....	15	31.5	23.5	13	31.2	22.0
20 months, under 21.....	19	31.5	23.4	18	31.6	22.8
21 months, under 22.....	40	32.0	24.6	23	31.3	22.1
22 months, under 23.....	24	32.3	24.2	25	31.8	23.7
23 months, under 24.....	19	32.7	25.3	16	32.2	23.7
24 months, under 27.....	79	33.1	25.7	55	32.9	24.6
27 months, under 30.....	64	34.3	27.1	65	33.6	25.9
30 months, under 33.....	62	34.8	28.3	56	34.4	26.8
33 months, under 36.....	52	35.2	28.9	65	35.0	28.4
36 months, under 39.....	68	36.2	30.1	51	35.4	28.2
39 months, under 42.....	42	36.9	31.1	40	36.7	30.7
42 months, under 45.....	59	37.3	31.7	64	36.9	30.2
45 months, under 48.....	74	38.0	32.7	85	37.5	31.2
48 months, under 51.....	69	38.2	33.0	79	38.4	32.4
51 months, under 54.....	64	39.2	34.5	69	39.1	33.5
54 months, under 57.....	69	39.7	35.5	53	39.7	35.1
57 months, under 60.....	62	40.3	36.1	66	40.5	36.2
60 months, under 63.....	80	41.1	37.5	76	40.6	36.4
63 months, under 66.....	86	41.5	38.2	84	41.3	36.9
66 months, under 69.....	83	42.1	39.0	80	42.0	37.5
69 months, under 70.....	79	43.3	40.0	83	42.9	39.8
72 months, under 75.....	90	42.1	40.9	81	43.1	40.4
75 months, under 78.....	90	44.0	42.6	82	43.3	39.9
78 months, under 81.....	74	44.1	42.9	83	44.0	41.8
81 months, under 84.....	69	45.1	44.2	87	44.4	42.3
84 months, under 87.....	65	45.1	45.0	93	45.2	45.2

<sup>1</sup> Twenty-five excluded owing to physical defects.

#### NUTRITION.

In the absence of any absolute standard for grading nutrition, an adaptation of the Dunfermline scale<sup>14</sup> was used in distinguishing four grades of nutrition, since, in addition, this system implies the types of remedial measures necessary.

While the Dunfermline system takes into consideration the general appearance of the child, including the condition of the skin, subcutaneous fat, muscle turgor, anemia, posture, vigor, etc., conditions all necessarily contributory to a complete picture of nutrition, any test based upon individual observation and judgment would produce

<sup>14</sup> The four groups are distinguished by the Dunfermline scale as follows: 1. "Excellent" means the nutrition of a healthy child "of good social standing." 2. Children whose nutrition falls just short of this standard are "good." 3. Children "requiring supervision" are on the border line of serious impairment. 4. Children "requiring medical treatment" are those whose nutrition is seriously impaired.

as great a variation in results as there were examiners. In this study, therefore, "grade of nutrition," as recorded for statistical purposes, was based upon deviations from the average weight-height ratios, irrespective of age. "Excellent" included all children above average weight for height whose general condition in the opinion of the examiners was better than "good." "Good" indicated that the weight was not under the arbitrary standard now in common usage, i. e., 10 per cent deviation below average weight for height. "Poor" and "very poor" meant a weight-height ratio 10 per cent or more below average, and distinguishable by the attention required, "poor" requiring supervision only and "very poor" indicating the need of medical attention.

While the weight-height ratio is recognized as but a single criterion in the composite picture of nutrition, and therefore in no sense a definite guide, its value as even a rough index of the general condition of nutrition was tested in various ways by the tabulations in this study. The distribution of undernourishment, thus graded, was decidedly less in this group of children than ordinarily reported—9.7 per cent. Since the care and uniformity with which the heights and weights were taken insure the reliability of the figures, the question is logically raised whether or not the average weights used as standard in this study are correct—and whether the 10 per cent deviation is applicable to children of these ages.

During the course of the study, it was frequently observed by the medical examiners that a grade intermediate between "good" and "poor" was desirable, as a number of children were graded "poor" and others graded "good" because the weight-height index placed them in these groups, contrary to the judgment and observation of the examiners. With this in mind, experimental tabulations were made to determine the number and kinds of defects in various weight-height groups, namely: (1) Average and above, (2) less than 7 per cent below the average,<sup>15</sup> (3) 7 per cent, but less than 10 per cent below, and (4) 10 per cent or more below.

The incidence of the various kinds of defects as they appeared in these four weight-deviation groups<sup>16</sup> suggests that except for anemia and defects of the bony and muscular systems there may be no definite relation between number and kinds of defects and degree of underweight.

These results also make apparent the need for further study of the growth of children between 2 and 7 years of age before any approximate standard of deviation from the average weight can be made for children at this age period. The large proportion of defects among

<sup>15</sup> Seven per cent deviation is apparently as arbitrary a standard as 10 per cent, but was the figure suggested by nutrition workers at the time this study was in progress as being a more significant deviation than the commonly used 10 per cent.

<sup>16</sup> See General Table 5, p. 68.

children of average weight or above suggests the importance of periodic physical examination.

Based on the weight-height ratio alone, Table V indicates that at least an average condition of nutrition (good and excellent) was found in 90.3 per cent of the group, although only 18.6 per cent were considered "excellent."

Boys varied from the average less than girls; of the latter 20.4 per cent were found in the "excellent" grade and 10.4 per cent in the malnourished group (poor and very poor combined) in contrast with the comparative percentages of 16.7 and 9, among the boys.

TABLE V.—Grade of nutrition, by age and sex; children 2 to 7 years of age given physical examination.

Age and sex.	Total children.	Grade of nutrition.							
		Excellent.		Good.		Poor.		Very poor.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Both sexes.....	3,125	580	18.6	2,242	71.7	281	9.0	22	0.7
2 years, under 3.....	511	71	13.9	355	69.5	81	15.9	4	.8
3 years, under 4.....	496	88	17.7	349	70.4	57	11.5	2	.4
4 years, under 5.....	549	100	18.2	393	71.6	54	9.8	2	.4
5 years, under 6.....	667	126	18.9	497	74.5	41	6.1	3	.4
6 years, under 7.....	682	142	20.8	492	72.1	40	5.9	8	1.2
7 years, under 8.....	220	53	24.1	156	70.9	8	3.6	3	1.4
Boys.....	1,555	259	16.7	1,156	74.3	130	8.4	10	.6
2 years, under 3.....	261	35	13.4	183	70.1	40	15.3	3	1.1
3 years, under 4.....	251	42	16.7	180	71.7	28	11.2	1	.4
4 years, under 5.....	274	42	15.3	204	74.5	27	9.9	1	.4
5 years, under 6.....	337	57	16.9	264	78.3	16	4.7	.....	.....
6 years, under 7.....	334	62	18.6	252	75.4	17	5.1	3	.9
7 years, under 8.....	98	21	21.4	73	74.5	2	2.0	2	2.0
Girls.....	1,570	321	20.4	1,086	69.2	151	9.6	12	.8
2 years, under 3.....	250	36	14.4	172	68.8	41	16.4	1	.4
3 years, under 4.....	245	46	18.8	169	69.0	29	11.8	1	.4
4 years, under 5.....	275	58	21.1	189	68.7	27	9.8	1	.4
5 years, under 6.....	330	69	20.9	233	70.6	25	7.6	3	.9
6 years, under 7.....	348	80	23.0	240	69.0	23	6.6	5	1.4
7 years, under 8.....	122	32	26.2	83	68.0	6	4.9	1	.8

Classified according to nationality, the well nourished showed an equal distribution among children of native and of foreign-born white parentage, although the former group had a slightly higher per cent of "excellently" nourished—20.9 as against 17. The highest per cent of "excellently nourished" in any nationality appeared in the Lithuanians (28.9), and the highest per cent of poorly nourished appeared in the Germans (15.1). Colored children showed an average condition regarding nutrition.

The higher income groups contained 20.5 per cent excellently nourished children and 9.4 per cent poorly nourished. The lower income groups contained 16.7 per cent excellently nourished and 10 per cent poorly nourished—indicating that higher family incomes do not necessarily imply more intelligent feeding and care.

TABLE VI.—Grade of nutrition, by color and nationality of mother; children 2 to 7 years of age given physical examination.

Color and nationality of mother.	Total children.	Grade of nutrition.							
		Excellent.		Good.		Poor.		Very poor.	
		Number.	Per cent. <sup>1</sup>	Number.	Per cent. <sup>1</sup>	Number.	Per cent. <sup>1</sup>	Number.	Per cent. <sup>1</sup>
Total.....	3,125	580	18.6	2,242	71.7	281	9.0	22	0.7
White.....	3,047	563	18.5	2,188	71.8	274	9.0	22	.7
Native.....	1,151	240	20.9	797	69.2	106	9.2	8	.7
Foreign-born.....	1,896	323	17.0	1,391	73.4	168	8.9	14	.7
Serbo-Croatian.....	321	58	18.1	235	73.2	26	8.1	2	.6
Slovak.....	313	36	11.5	243	77.6	29	9.3	5	1.6
Polish.....	224	29	12.9	172	76.8	21	9.4	2	.9
Magyar.....	176	34	19.3	131	74.4	11	6.3	.....	.....
Italian.....	157	33	21.0	115	73.2	9	5.7	.....	.....
German.....	139	27	19.4	91	65.5	20	14.4	1	.7
Lithuanian.....	83	24	28.9	53	63.9	6	7.2	.....	.....
All other.....	483	82	17.0	351	72.7	46	9.5	4	.8
Negro.....	71	15	21.1	49	69.0	7	9.9	.....	.....
Not reported.....	7	2	.....	5	.....	.....	.....	.....	.....

<sup>1</sup> Not shown where base is less than 50.

TABLE VII.—Grade of nutrition, by earnings of chief breadwinner; children 2 to 7 years of age given physical examination.

Earnings of chief breadwinner.	Total children.	Grade of nutrition.							
		Excellent.		Good.		Poor.		Very poor.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Total.....	3,125	580	18.6	2,242	71.7	281	9.0	22	0.7
Under \$650.....	110	11	10.0	89	80.9	9	8.2	1	.9
\$650-\$849.....	240	36	15.0	179	74.6	20	8.3	5	2.1
\$850-\$1,049.....	412	56	13.6	317	76.9	34	8.3	5	1.2
\$1,050-\$1,249.....	491	94	19.1	342	69.7	53	10.8	2	.4
\$1,250-\$1,449.....	456	88	19.3	326	71.5	39	8.6	3	.7
\$1,450-\$1,849.....	613	121	19.7	430	70.1	60	9.8	2	.3
\$1,850-\$2,249.....	262	53	20.2	183	69.8	24	9.2	2	.8
\$2,250 and over.....	303	68	22.4	212	70.0	22	7.3	1	.3
No chief breadwinner and no earnings.....	58	11	19.0	42	72.4	5	8.6	.....	.....
Not reported.....	180	42	23.3	122	67.8	15	8.3	1	.6

## ANEMIA.

Obviously, mere inspection of the mucous membranes for pallor furnishes no accurate guide as to the degree of anemia; but in this type of study blood examinations are not feasible. However, the results here recorded coincide somewhat closely with those of more accurate clinical methods.

Nearly 8 per cent of the group were considered anemic. There was very slight difference in this respect between boys and girls, but pallor was more common in the older children. In both sexes a very notable increase in the percentage of pale children appeared after

the fifth year, and a marked increase during the seventh year, when 16.7 per cent showed unusual pallor.

The percentage of anemic children was slightly higher among the children of foreign-born parentage (8.6) than among those of native white parentage (6.2). The colored children showed the highest percentage (11.3).

Children in the families of income groups below \$1,450 showed a slightly higher percentage of anemia (8.4) than children in the families of the groups where earnings were \$1,450 and over (6.5).

While pallor is generally considered a fairly constant sign in malnutrition, in this study only 13.9 per cent of the most seriously underweight children were considered anemic.

#### VACCINATION.

Unless the mother was with the child, no history as to age or success of smallpox vaccination was obtainable, and the presence of a scar was the evidence on which vaccination was checked.

TABLE VIII.—*Vaccination, by age and sex; children 2 to 7 years of age given physical examination.*

Age and sex.	Total children.	Vaccinated.		Not vaccinated.		Not reported whether vaccinated.
		Number.	Per cent.	Number.	Per cent.	
Both sexes.....	3,125	762	24.4	2,358	75.5	5
2 years, under 3.....	511	44	8.6	467	91.4	.....
3 years, under 4.....	496	75	15.1	421	84.9	.....
4 years, under 5.....	549	111	20.2	436	79.4	2
5 years, under 6.....	667	195	29.2	470	70.5	2
6 years, under 7.....	682	253	37.1	428	62.8	1
7 years, under 8.....	220	84	38.2	136	61.8	.....
Boys.....	1,555	368	23.7	1,184	76.1	3
2 years, under 3.....	261	23	8.8	238	91.2	.....
3 years, under 4.....	251	34	13.5	217	86.5	.....
4 years, under 5.....	274	48	17.5	225	82.1	1
5 years, under 6.....	337	101	30.0	234	69.4	2
6 years, under 7.....	334	126	37.7	208	62.3	.....
7 years, under 8.....	98	36	36.7	62	63.3	.....
Girls.....	1,570	394	25.1	1,174	74.8	2
2 years, under 3.....	250	21	8.4	229	91.6	.....
3 years, under 4.....	245	41	16.7	204	83.3	.....
4 years, under 5.....	275	63	22.9	211	76.7	1
5 years, under 6.....	330	94	28.5	236	71.5	.....
6 years, under 7.....	348	127	36.5	220	63.2	1
7 years, under 8.....	122	48	39.3	74	60.7	.....

Of all the children examined, only 24.4 per cent had been vaccinated. Early vaccination, i. e., by 1 year of age, appears not to have been the rule, for only 8.6 per cent of the children between 2 and 3 years of age had been vaccinated. The percentage increased with each year of age, however, and reached 37.1 by the seventh year, indicating that the school-entrance requirement was the principal

factor influencing vaccination. About one-sixth (14.6 per cent) of the 1,581 children who had not entered school had been vaccinated, while of the 1,544 attending school more than one-third (34.4 per cent) had been vaccinated.

TABLE IX.—*Vaccination, time of vaccination, and entrance in school, by color and nationality of mother; children 2 to 7 years of age given physical examination.*

Vaccination, time of vaccination, and entrance in school.	Total children.		Children of—						
			Native white mothers.		Foreign-born white mothers.		Negro mothers.		Mothers whose nationality was not reported.
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	
Total.....	3,125	100.0	1,151	100.0	1,896	100.0	71	100.0	7
Not yet in school.....	1,581	50.6	596	51.8	949	50.1	32	45.1	4
Vaccinated.....	231	7.4	56	4.9	175	9.2	.....	.....	.....
Not vaccinated.....	1,348	43.1	540	46.9	772	40.7	32	45.1	4
Not reported.....	2	.1	.....	.....	2	.1	.....	.....	.....
In school.....	1,544	49.4	555	48.2	947	49.9	39	54.9	3
Vaccinated.....	531	17.0	149	12.9	374	19.7	7	9.9	1
Before entering school.....	142	4.5	40	3.5	99	5.2	2	2.8	1
After entering school.....	71	2.3	36	3.1	33	1.7	2	2.8	.....
Not reported.....	318	10.2	73	6.3	242	12.8	3	4.2	.....
Not vaccinated.....	1,010	32.3	406	35.3	570	30.1	32	45.1	2
Vaccination not reported.....	3	.1	.....	.....	3	.2	.....	.....	.....

A comparison by nationality shows that 28.9 per cent of the children of foreign-born white mothers and 17.8 per cent of those of native white mothers had been vaccinated.

It was impossible to get entirely accurate figures as to how many of the school children were vaccinated before and after entering school, on account of the large number of cases in which no report on this subject was made. However, an analysis of the few cases where an answer to this question was obtained revealed the fact that among 132 children of foreign-born white parentage, three times as many were vaccinated before entering school as after entering, 99 as compared with 33; while among 76 children of native white parentage, almost as many were vaccinated after entering school as before entering, 36 as compared with 40.

The fact that in the mother countries people are accustomed to compulsory vaccination probably accounts for the greater frequency and earlier ages of vaccination among the children of foreign-born parentage.

#### HEAD.

While anthropometric head measurements were not made in this study, observations were recorded as to apparent abnormalities in size in 76 cases. More than twice as many boys as girls had abnormally shaped heads, the square or rachitic head being the most preva-

lent type. Open fontanelles ranging in diameter from 1 centimeter to 2½ centimeters persisted in 13 children in this group, of whom one was past 3 years of age.

## EYES.

It was possible to test vision in only about two-thirds (2,044 cases) of the children who were given physical examinations, since only the exceptional child under 3 years of age comprehended the test at all and only a very small number (124) of children under 4 years did so.

Out of the 2,044 children given vision tests, slightly more than one-third (36.1 per cent) showed defective sight of varying degree, with apparently no significant relation to age, although the fifth year showed a slightly higher per cent than any of the others (39).

TABLE X.—Defect of vision, by age; children 2 to 7 years of age given physical examination.

Defect of vision.	Total children.		2 years, under 3. <sup>1</sup>	3 years, under 4.		4 years, under 5.		5 years, under 6.		6 years, under 7.		7 years, under 8.	
	Number.	Per cent distribution.		Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Total.....	3,125	.....	511	496	.....	549	.....	667	.....	682	.....	220	.....
Vision tested.....	2,044	100.0	4	124	100.0	403	100.0	631	100.0	663	100.0	219	100.0
Vision normal.....	1,306	63.9	3	85	68.5	248	61.5	385	61.0	414	62.4	171	78.1
Vision defective....	738	36.1	1	39	31.5	155	38.5	246	39.0	249	37.6	48	21.9
Both slightly defective.....	461	22.6	1	29	23.4	101	25.1	163	25.8	142	21.4	25	11.4
Both seriously defective.....	108	5.3	.....	3	2.4	18	4.5	32	5.1	44	6.6	11	5.0
One normal, one slightly defective.....	76	3.7	.....	3	2.4	20	5.0	22	3.5	27	4.1	4	1.8
One normal, one seriously defective.....	29	1.4	.....	.....	.....	4	1.0	6	1.0	16	2.4	3	1.4
One slightly defective, other seriously defective.....	61	3.0	.....	3	2.4	12	3.0	22	3.5	19	2.9	5	2.3
Blind in one or both eyes.....	3	.1	.....	1	.8	.....	.....	1	.2	1	.2	.....	.....
Vision not tested.....	1,081	.....	507	372	.....	146	.....	36	.....	19	.....	1	.....

<sup>1</sup> Per cent distribution not shown where base is less than 50.

The degree of visual abnormality varied from slight defect of one eye to serious defect of one or both, and even blindness.

In 108 cases vision was seriously defective in both eyes and the need for glasses imperative, as shown by the test and corroborated by the specialist. Of these children, only 10 per cent were wearing glasses; the other 90 per cent were not even cognizant of the need for them.

Strabismus was found in 2.4 per cent of all the children, but corrective glasses for this defect were being worn by only about one-seventh of the children with this defect. While fewer boys (33) than girls (43) had strabismus, it is worthy of comment that of the 11 children having strabismus and wearing glasses only 1 was a boy.



Eye diseases and defects other than those of vision were found in 7.8 per cent of all the children; but twice as large a proportion of those with poor vision (12.6 per cent) as of those with normal vision (6.4 per cent) had other eye defects or diseases.

TABLE XI.—*Vision, by sex and eye disease or other defect; children 2 to 7 years of age given physical examination.*

Vision and sex.	Total children.	With eye disease or defect other than vision.		Without eye disease.
		Number.	Per cent.	
Both sexes.....	3,125	245	7.8	2,880
Vision tested.....	2,044	177	8.7	1,867
Normal.....	1,306	84	6.4	1,222
Defective.....	738	93	12.6	645
Vision not tested.....	1,081	68	6.3	1,013
Boys.....	1,555	127	8.2	1,428
Vision tested.....	998	91	9.1	907
Normal.....	643	46	7.2	597
Defective.....	355	45	12.7	310
Vision not tested.....	587	36	6.5	551
Girls.....	1,570	118	7.5	1,452
Vision tested.....	1,046	86	8.2	960
Normal.....	663	38	5.7	625
Defective.....	383	48	12.5	335
Vision not tested.....	524	32	6.1	492

On the whole, slight difference was found between the eye conditions of the children of native and of foreign-born white parentage. Among the latter, the highest percentage with defective vision was found among the children of Italian parentage. The colored children, although few in number, were freer from eye defects than any other group of children, only 1 out of 71 (1.4 per cent) having eye defect.

TABLE XII.—*Eye disease or defect other than of vision, by color and nationality of mother; children 2 to 7 years of age given physical examination.*

Color and nationality of mother.	Total children.	With eye disease or defect other than of vision.		Without eye disease.
		Number.	Per cent.	
Total.....	3,125	245	7.8	2,880
White.....	3,047	244	8.0	2,803
Native.....	1,151	86	7.5	1,065
Foreign-born.....	1,896	158	8.3	1,738
Serbo-Croatian.....	321	27	8.4	294
Slovak.....	313	32	10.2	281
Polish.....	224	13	5.8	211
Magyar.....	176	17	9.7	159
Italian.....	157	19	12.1	138
German.....	139	11	7.9	128
Lithuanian.....	83	4	4.8	79
All other.....	483	35	7.2	448
Negro.....	71	1	1.4	70
Not reported.....	7	.....	.....	7

## EARS.

It was not possible to test successfully as many children for hearing as for vision, as sufficiently quiet quarters could not always be obtained. The total number examined was about 200 less than the number tested for vision. The total number of cases of defective hearing, including slight and serious defect of one or both ears, was only 25, or 1.4 per cent of those examined.

Aside from defective hearing, the other ear defects noted were 25 cases of otorrhea and 258 cases of retracted ear drums.

## MOUTH.

## Teeth.

The most conspicuous single defect in the entire preschool group was carious teeth. This condition was found in 64.7 per cent of the children examined, the percentages increasing from 21.1 in the 2- to 3-year-old children to 87.7 in the 6- to 7-year-olds. In the entire group, 83 children had decayed permanent teeth.

TABLE XIII.—Decayed teeth, by age and sex; children 2 to 7 years of age given physical examination.

Age and sex	Total children.	Without decayed teeth.		With decayed teeth.							
				Total.		Temporary only.		Temporary and permanent.		Permanent only.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Both sexes.....	3,125	1,104	35.3	2,021	64.7	1,938	62.0	80	2.6	3	0.1
2 years, under 3.....	511	403	78.9	108	21.1	108	21.1				
3 years, under 4.....	496	278	55.0	218	44.0	218	44.0				
4 years, under 5.....	549	185	33.7	364	66.3	363	66.1	1	.2		
5 years, under 6.....	667	134	20.1	533	79.9	520	78.0	13	1.9		
6 years, under 7.....	682	84	12.3	598	87.7	555	81.4	41	6.0	2	.3
7 years, under 8.....	220	20	9.1	200	90.9	174	79.1	25	11.4	1	.5
Boys.....	1,555	548	35.2	1,007	64.8	976	62.8	31	2.0		
2 years, under 3.....	261	204	78.2	57	21.8	57	21.8				
3 years, under 4.....	251	136	54.2	115	45.8	115	45.8				
4 years, under 5.....	274	92	33.6	182	66.4	181	66.1	1	.4		
5 years, under 6.....	337	64	19.0	273	81.0	266	78.9	7	2.1		
6 years, under 7.....	334	41	12.3	293	87.7	279	83.5	14	4.2		
7 years, under 8.....	98	11	11.2	87	88.8	78	79.6	9	9.2		
Girls.....	1,570	556	35.4	1,014	64.6	962	61.3	49	3.1	3	.2
2 years, under 3.....	250	199	79.6	51	20.4	51	20.4				
3 years, under 4.....	245	142	58.0	103	42.0	103	42.0				
4 years, under 5.....	275	93	33.8	182	66.2	182	66.2				
5 years, under 6.....	330	70	21.2	260	78.8	254	77.0	6	1.8		
6 years, under 7.....	348	43	12.4	305	87.6	276	79.3	27	7.8	2	.6
7 years, under 8.....	122	9	7.4	113	92.6	96	78.7	16	13.1	1	.8

Information regarding previous dental attention showed that only 3.2 per cent had had any teeth filled, such a very small proportion at once indicating ignorance regarding the importance of dental attention for temporary teeth. One child under 3 years of age had a

filled tooth, but 108 between 2 and 3 years had decayed teeth which had not been filled. The lack of dental care was almost as serious among the older children, 95 per cent of those between 6 and 7 with decayed teeth having received no attention whatever.

**Other mouth defects.**

Gum abscesses and malocclusion were the other most frequent mouth defects, 3.2 per cent showing the former and 11 per cent the latter defect. Malocclusion showed only slight variations by sex, but a decided increase with age, especially marked after the fifth year. This defect was found to occur approximately three times as often among children with positive diagnosis of adenoids as among others.

**NASOPHARYNX.**

Defects of the nasopharynx were the most common type of defect noted in this preschool group, occurring in 69 per cent of all cases, while the defects of the mouth claimed second place with 66.9 per cent. On the whole there was a slightly higher per cent of boys with nasopharyngeal defects than of girls, 71.9 and 66.2 per cent, respectively. The highest per cent of nasopharyngeal defects for both sexes (78.1 per cent) appeared in the sixth year.

TABLE XIV.—*Nasopharyngeal defect, by age and sex; children 2 to 7 years of age given physical examination.*

Nasopharyngeal defect, and sex.	Total children.		2 years, under 3.		3 years, under 4.		4 years, under 5.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	3,125	100.0	511	100.0	496	100.0	549	100.0
With nasopharyngeal defect.....	2,157	69.0	250	48.9	312	62.9	395	71.9
Defective tonsils only.....	711	22.8	154	30.1	165	33.3	165	30.1
Adenoids only.....	342	10.9	19	3.7	34	6.9	54	9.8
Defective tonsils with adenoids.....	915	29.3	49	9.6	89	17.9	154	28.1
High-arch palate only.....	179	5.7	27	5.3	23	4.6	21	3.8
Other nasopharyngeal defect.....	10	.3	1	.2	1	.2	1	.2
Without nasopharyngeal defect.....	968	31.0	261	51.1	184	37.1	154	28.1
Boys.....	1,555	100.0	261	100.0	251	100.0	274	100.0
With nasopharyngeal defect.....	1,118	71.9	135	51.7	166	66.1	199	72.6
Defective tonsils only.....	348	22.4	79	30.3	83	33.1	81	29.6
Adenoids only.....	188	12.1	10	3.8	20	8.0	27	9.9
Defective tonsils with adenoids.....	488	31.4	31	11.9	49	19.5	82	29.9
High-arch palate only.....	91	5.9	15	5.7	13	5.2	9	3.3
Other nasopharyngeal defect.....	3	.2	—	—	1	.4	—	—
Without nasopharyngeal defect.....	437	28.1	126	48.3	85	33.9	75	27.4
Girls.....	1,570	100.0	250	100.0	245	100.0	275	100.0
With nasopharyngeal defect.....	1,039	66.2	115	46.0	146	59.6	196	71.3
Defective tonsils only.....	363	23.1	75	30.0	82	33.5	84	30.5
Adenoids only.....	154	9.8	9	3.6	14	5.7	27	9.8
Defective tonsils with adenoids.....	427	27.2	18	7.2	40	16.3	72	26.2
High-arch palate only.....	88	5.6	12	4.8	10	4.1	12	4.4
Other nasopharyngeal defect.....	7	.4	1	.4	—	—	1	.4
Without nasopharyngeal defect.....	531	33.8	135	54.0	99	40.4	79	28.7

TABLE XIV.—*Nasopharyngeal defect, by age and sex; children 2 to 7 years of age given physical examination—Concluded.*

Nasopharyngeal defect, and sex.	5 years, under 6.		6 years, under 7.		7 years, under 8.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	667	100.0	682	100.0	220	100.0
With nasopharyngeal defect.....	521	78.1	517	75.8	162	73.6
Defective tonsils only.....	111	16.6	82	12.0	34	15.5
Adenoids only.....	97	14.5	106	15.5	32	14.5
Defective tonsils with adenoids.....	266	39.9	283	41.5	74	33.6
High-arch palate only.....	42	6.3	44	6.5	22	10.0
Other nasopharyngeal defect.....	5	.7	2	.3	.....	.....
Without nasopharyngeal defect.....	146	21.9	165	24.2	58	26.4
Boys.....	337	100.0	334	100.0	98	100.0
With nasopharyngeal defect.....	274	81.3	268	80.2	76	77.6
Defective tonsils only.....	45	13.4	40	12.0	20	20.4
Adenoids only.....	53	15.7	62	18.6	16	16.3
Defective tonsils with adenoids.....	153	45.4	143	42.8	30	30.6
High-arch palate only.....	22	6.5	22	6.6	10	10.2
Other nasopharyngeal defect.....	1	.3	1	.3	.....	.....
Without nasopharyngeal defect.....	63	18.7	66	19.8	22	22.4
Girls.....	330	100.0	348	100.0	122	100.0
With nasopharyngeal defect.....	247	74.8	249	71.6	86	70.5
Defective tonsils only.....	66	20.0	42	12.1	14	11.5
Adenoids only.....	44	13.3	44	12.6	16	13.1
Defective tonsils with adenoids.....	113	34.2	140	40.2	44	36.1
High-arch palate only.....	20	6.1	22	6.3	12	9.8
Other nasopharyngeal defect.....	4	1.2	1	.3	.....	.....
Without nasopharyngeal defect.....	83	25.2	99	28.4	36	29.5

**Adenoids.**

Adenoids were definitely diagnosed in one-third (33.6 per cent) of all children examined, while an additional 6.6 per cent were considered as probably having adenoids, this being indicated by the presence of one or more suggestive signs, viz., mouth breathing, nasal discharge with excoriation of the nares, high-arch palate, adenoid facies, etc.

TABLE XV.—*Adenoid condition, by age and sex; children 2 to 7 years of age given physical examination.*

Adenoid condition, and sex.	Total children.		2 years, under 3.		3 years, under 4.		4 years, under 5.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	3,125	100.0	511	100.0	496	100.0	549	100.0
With adenoids (definite).....	1,050	33.6	34	6.7	76	15.3	164	29.9
With adenoids (suspected).....	207	6.6	34	6.7	47	9.5	44	8.0
Without adenoids.....	1,868	59.8	443	86.7	373	75.2	341	62.1
Boys.....	1,555	100.0	261	100.0	251	100.0	274	100.0
With adenoids (definite).....	570	36.7	18	6.9	42	16.7	88	32.1
With adenoids (suspected).....	106	6.8	23	8.8	27	10.8	21	7.7
Without adenoids.....	879	56.5	220	84.3	182	72.5	165	60.2
Girls.....	1,570	100.0	250	100.0	245	100.0	275	100.0
With adenoids (definite).....	480	30.6	16	6.4	34	13.9	76	27.6
With adenoids (suspected).....	101	6.4	11	4.4	20	8.2	23	8.4
Without adenoids.....	989	63.0	223	89.2	191	78.0	176	64.0

TABLE XV.—Adenoid condition, by age and sex; children 2 to 7 years of age given physical examination—Concluded.

Adenoid condition, and sex.	5 years, under 6.		6 years, under 7.		7 years, under 8.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	667	100.0	682	100.0	220	100.0
With adenoids (definite).....	315	47.2	361	52.9	100	45.5
With adenoids (suspected).....	48	7.2	28	4.1	6	2.7
Without adenoids.....	304	45.6	293	43.0	114	51.8
Boys.....	337	100.0	334	100.0	98	100.0
With adenoids (definite).....	187	55.5	191	57.2	44	44.9
With adenoids (suspected).....	19	5.6	14	4.2	2	2.0
Without adenoids.....	131	38.9	129	38.6	52	53.1
Girls.....	330	100.0	348	100.0	122	100.0
With adenoids (definite).....	128	38.8	170	48.9	56	45.9
With adenoids (suspected).....	29	8.8	14	4.0	4	3.3
Without adenoids.....	173	52.4	164	47.1	62	50.8

Adenoids were more prevalent among boys, throughout all the pre-school years. Only 6.7 per cent of the children under 3 years of age had adenoids definitely diagnosed and an equal number had "suspected" ones. The number of cases of positively diagnosed adenoids increased with age, reaching a maximum of 52.9 during the seventh year, while the maximum in "suspected" cases was reached during the fourth year. Whether adenoids are often present in younger children, and, if present, whether they are of such slow growth that their effects are not manifested by symptoms until the sixth or seventh year, is a question inviting further observation and scientific investigation.

Only insignificant differences in the prevalence of adenoids between the children of native and of foreign-born white mothers were found, the percentages being 34.3 and 33.8, respectively. The highest per cent of adenoids (41) was found in the children of German parentage, the lowest per cent (19.7) in the colored children.

#### Symptoms suggesting adenoids.

(a) *Mouth breathing.*—Of the entire group of children examined, 39.4 per cent were mouth breathers. Mouth breathing proved a remarkably constant symptom of adenoids, being present in 99.6 per cent of the cases. Only four cases of adenoids in which the child was apparently not a mouth breather were recorded and in six cases mouth breathing persisted after the removal of adenoids. It became a more pronounced habit or defect with age; 12.7 per cent of the children 2 to 3 years of age, and 56.2 per cent of those 6 to 7 years of age were mouth breathers. This symptom or defect was more common among boys, showing 43.1 per cent as compared with 35.8 per cent among girls.

Malocclusion and high-arch palate apparently had a direct relation to mouth breathing, since 62.4 per cent of the children with malocclusion and 65.4 per cent of those with high-arch palate were mouth breathers.

(b) *Nasal discharge*.—Nine and six tenths per cent of all children had what was considered a chronic nasal discharge, 10.1 per cent of the boys and 9 per cent of the girls.

(c) *Nasal obstruction*.—Thirty-eight and two-tenths per cent of the children showed nasal obstruction. Of the cases of malocclusion 59.8 per cent showed nasal obstruction, as compared with 35.5 per cent of those without malocclusion.

(d) *High-arch palate*.—According to the observations of the examiners, practically one-third of all the children, 1,027 out of 3,125, showed high-arch palate. This condition prevailed in more than half (57.4 per cent) of the cases of malocclusion, and in a still higher percentage (59.5) of the positive cases of adenoids.

(e) *Ear drums*.—Retracted drums, which were considered a corroborative sign of adenoids, were found in 258 of the cases examined by the specialist. This is probably an understatement, since not all children were observed by the specialist. In 94.6 per cent of the children with retracted drums, adenoids were also found.

Hearing appears to have been only slightly impaired by retracted drums either with or without adenoids, since it was found to be defective in only 8, or 3.5 per cent, of the 231 cases of retracted ear drums in which hearing was tested, as compared with 1 per cent in the rest of the group.

(f) *Adenoid facies*.—So-called typical adenoid facies were observed in slightly more than one-third (37.2 per cent) of the children having adenoids. This symptom was more common in boys and showed an increase with age to the seventh year.

### **Tonsils.**

A little less than half (45.4 per cent) of the total number of children examined had tonsils which would generally be considered normal, since they showed no enlargement or evidence of disease. More than half (56.3 per cent) the children with abnormal tonsils also had adenoids. Of the entire group 2.5 per cent, or 1 in 40, gave a history of having had tonsils removed.

Slight enlargement of the tonsils was far more common than other tonsillar affections, being found in slightly more than one-third (34.9 per cent) of the children. The maximum of simple enlargement, which increased in prevalence with each year of age, was reached during the fifth year, and thereafter a steady and even decrease was shown. Possibly these findings suggest that enlargement without disease may be merely a hyperplasia of lymphoid tissue, normal at this period of life.

TABLE XVI.—Condition of tonsils, by age and sex; children 2 to 7 years of age given physical examination.

Condition of tonsils, and sex.	Total children.		2 years, under 3.		3 years, under 4.		4 years, under 5.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	3,125	100.0	511	100.0	496	100.0	549	100.0
Tonsils:								
Normal.....	1,420	45.4	308	60.3	237	47.8	223	40.6
Defective.....	1,626	52.0	203	39.7	254	51.2	319	58.1
Enlarged only.....	1,091	34.9	188	36.8	211	42.5	244	44.4
Greatly enlarged only.....	129	4.1	5	1.0	10	2.0	20	3.6
Diseased.....	406	13.0	10	2.0	33	6.7	55	10.0
Enlarged.....	266	8.5	5	1.0	21	4.2	31	5.6
Greatly enlarged.....	134	4.3	5	1.0	12	2.4	23	4.2
Not enlarged.....	6	.2					1	.2
Removed.....	79	2.5			5	1.0	7	1.3
Boys.....	1,555	100.0	261	100.0	251	100.0	274	100.0
Tonsils:								
Normal.....	671	43.2	151	57.9	115	45.8	108	39.4
Defective.....	836	53.8	110	42.1	132	52.6	163	59.5
Enlarged only.....	574	36.9	101	38.7	110	43.8	126	46.0
Greatly enlarged only.....	61	3.9	3	1.1	5	2.0	8	2.9
Diseased.....	201	12.9	6	2.3	17	6.8	29	10.6
Enlarged.....	132	8.5	3	1.1	10	4.0	16	5.8
Greatly enlarged.....	65	4.2	3	1.1	7	2.8	12	4.4
Not enlarged.....	4	.3					1	.4
Removed.....	48	3.1			4	1.6	3	1.1
Girls.....	1,570	100.0	250	100.0	245	100.0	275	100.0
Tonsils:								
Normal.....	749	47.7	157	62.8	122	49.8	115	41.8
Defective.....	790	50.3	93	37.2	122	49.8	156	56.7
Enlarged only.....	517	32.9	87	34.8	101	41.2	118	42.9
Greatly enlarged only.....	68	4.3	2	.8	5	2.0	12	4.4
Diseased.....	205	13.1	4	1.6	16	6.5	26	9.5
Enlarged.....	134	8.5	2	.8	11	4.5	15	5.5
Greatly enlarged.....	69	4.4	2	.8	5	2.0	11	4.0
Not enlarged.....	2	.1						
Removed.....	31	2.0			1	.4	4	1.5

Condition of tonsils, and sex.	5 years, under 6.		6 years, under 7.		7 years, under 8.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	667	100.0	682	100.0	220	100.0
Tonsils:						
Normal.....	263	39.4	285	41.8	104	47.3
Defective.....	377	56.5	365	53.5	108	49.1
Enlarged only.....	221	33.1	176	25.8	51	23.2
Greatly enlarged only.....	42	6.3	39	5.7	13	5.9
Diseased.....	114	17.1	150	22.0	44	20.0
Enlarged.....	78	11.7	99	14.5	32	14.5
Greatly enlarged.....	34	5.1	49	7.2	11	5.0
Not enlarged.....	2	.3	2	.3	1	.5
Removed.....	27	4.0	32	4.7	8	3.6
Boys.....	337	100.0	334	100.0	98	100.0
Tonsils:						
Normal.....	123	36.5	132	39.5	42	42.9
Defective.....	198	58.8	183	54.8	50	51.0
Enlarged only.....	112	33.2	98	29.3	27	27.6
Greatly enlarged only.....	27	8.0	15	4.5	3	3.1
Diseased.....	59	17.5	70	21.0	20	20.4
Enlarged.....	41	12.2	49	14.7	13	13.3
Greatly enlarged.....	16	4.7	21	6.3	6	6.1
Not enlarged.....	2	.6			1	1.0
Removed.....	16	4.7	19	5.7	6	6.1

TABLE XVI.—Condition of tonsils, by age and sex; children 2 to 7 years of age given physical examination—Concluded.

Condition of tonsils, and sex.	5 years, under 6.		6 years, under 7.		7 years, under 8.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Girls.....	330	100.0	348	100.0	122	100.0
Tonsils:						
Normal.....	140	42.4	153	44.0	62	50.8
Defective.....	179	54.2	182	52.3	58	47.5
Enlarged only.....	109	33.0	78	22.4	24	19.7
Greatly enlarged only.....	15	4.5	24	6.9	10	8.2
Diseased.....	55	16.7	80	23.0	24	19.7
Enlarged.....	37	11.2	50	14.4	19	15.6
Greatly enlarged.....	18	5.5	28	8.0	5	4.1
Not enlarged.....			2	.6		
Removed.....	11	3.3	13	3.7	2	1.6

Greatly enlarged tonsils, i. e., those nearly filling the throat, were found in only 8.4 per cent of the children; in one-half these cases the tonsils were also diseased. This degree of enlargement also showed definite increase with age.

Tonsils considered "diseased" were found in 13 per cent of all the children in the group and showed a steady increase from 2 per cent in the 2- to 3-year group to 22 per cent in the 6- to 7-year group.

Practically all "diseased" tonsils showed some enlargement; in only six cases were the tonsils recorded as "diseased" but not "enlarged." Approximately two-thirds of the "diseased" tonsils were associated with slight enlargement, the other third being recorded as "greatly enlarged."

The standards adopted in this study for the recommendation of the removal of tonsils<sup>17</sup> compelled a rather conservative viewpoint, but in spite of this it was considered by the specialist that removal was required in 39.3 per cent of the 1,626 cases of tonsillar defect. Parents were instructed to keep the throats of the remaining number under observation.

Removal was recommended more commonly among the older children, the percentages based upon total number of children having defective tonsils ranging from 6.9 at 2 to 3 years, to 61.9 at 6 to 7 years.

Removal of both tonsils and adenoids was recommended in 57.3 per cent of the cases in which both conditions were present. Removal of tonsils alone was necessary in but 7.1 per cent of all cases of defective tonsils.

Table XVII indicates a definite relation between diseased tonsils and age, but apparently shows little relation between decayed teeth and diseased tonsils.

<sup>17</sup> See p. 25.



TABLE XVII.—Prevalence of diseased tonsils, by presence of decayed teeth; children 2 to 7 years of age given physical examination.

Age.	Children without decayed teeth.			Children with decayed teeth.		
	Total.	With diseased tonsils.		Total.	With diseased tonsils.	
		Number.	Per cent. <sup>1</sup>		Number.	Per cent. <sup>1</sup>
2 years, under 3.....	403	8	2.0	108	2	1.9
3 years, under 4.....	278	16	5.8	218	17	7.8
4 years, under 5.....	185	15	8.1	364	40	11.0
5 years, under 6.....	134	26	19.4	533	88	16.5
6 years, under 7.....	84	18	21.4	598	132	22.1
7 years, under 8.....	20	2	.....	200	42	.....

<sup>1</sup> Not shown where base is less than 50.

There appeared to be no striking difference in the condition of the tonsils of the children of native and foreign-born white parentage; defective tonsils were found in 51.5 per cent of the latter as against 53.2 per cent of the former. The highest per cent found in any nationality group was 57.9 in the Serbo-Croatians, while the lowest per cent (47.9) was found among the colored children.

Correlations with earnings did not even suggest that the children of well-to-do parents had fewer tonsillar defects than those of poorer families, except that a larger per cent in the higher income groups had had tonsils removed.

#### GLANDS.

The condition of the superficial external lymphatic glands as to size and associated infection is shown in Table XVIII.

Since a certain degree of swelling and hyperplasia is considered normal during early childhood, only glands described as "enlarged" or "greatly enlarged" were in this study considered as defects. However, in 17.6 per cent of the children glands were not even "palpable," and for this reason further observation seems necessary to determine whether or not palpability should be considered normal even at this period of life.

TABLE XVIII.—*Condition of glands, by age and sex; children 2 to 7 years of age given physical examination.*

Condition of glands, and sex.	Total children.		2 years, under 3.		3 years, under 4.		4 years, under 5.	
	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.
Both sexes.....	3,125	100.0	511	100.0	496	100.0	549	100.0
Glands:								
Nonpalpable.....	550	17.6	195	38.2	131	26.4	87	15.8
Palpable.....	1,667	53.3	250	48.9	289	58.3	312	56.8
Enlarged or greatly enlarged.....	908	29.1	66	12.9	76	15.3	150	27.3
Without associated infection.....	143	4.6	26	5.1	17	3.4	20	3.6
With associated infection.....	765	24.5	40	7.8	59	11.9	130	23.7
Boys.....	1,555	100.0	261	100.0	251	100.0	274	100.0
Glands:								
Nonpalpable.....	260	16.7	99	37.9	68	27.1	32	11.7
Palpable.....	806	51.8	131	50.2	128	55.0	160	58.4
Enlarged or greatly enlarged.....	489	31.4	31	11.9	45	17.9	82	29.9
Without associated infection.....	74	4.8	12	4.6	11	4.4	11	4.0
With associated infection.....	415	26.7	19	7.3	34	13.5	71	25.9
Girls.....	1,570	100.0	250	100.0	245	100.0	275	100.0
Glands:								
Nonpalpable.....	290	18.5	96	38.4	63	25.7	55	20.0
Palpable.....	861	54.8	119	47.6	151	61.6	152	55.3
Enlarged or greatly enlarged.....	419	26.7	35	14.0	31	12.7	68	24.7
Without associated infection.....	69	4.4	14	5.6	6	2.4	9	3.3
With associated infection.....	350	22.3	21	8.4	25	10.2	59	21.5
					5 years, under 6.	6 years, under 7.	7 years, under 8.	
Condition of glands, and sex.					Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.
Both sexes.....					667	100.0	682	100.0
Glands:								
Nonpalpable.....					71	10.6	47	6.9
Palpable.....					346	51.9	370	54.3
Enlarged or greatly enlarged.....					250	37.5	265	38.9
Without associated infection.....					34	5.1	28	4.1
With associated infection.....					216	32.4	237	34.8
Boys.....					337	100.0	334	100.0
Glands:								
Nonpalpable.....					36	10.7	18	5.4
Palpable.....					165	49.0	168	50.3
Enlarged or greatly enlarged.....					136	40.4	148	44.3
Without associated infection.....					17	5.0	13	3.9
With associated infection.....					119	35.3	135	40.4
Girls.....					330	100.0	348	100.0
Glands:								
Nonpalpable.....					35	10.6	29	8.3
Palpable.....					181	54.8	202	58.0
Enlarged or greatly enlarged.....					114	34.5	117	33.6
Without associated infection.....					17	5.2	15	4.3
With associated infection.....					97	29.4	102	29.3

TABLE XIX.—Condition of cervical glands, by condition of tonsils and teeth; children 2 to 7 years of age given physical examination.

Condition of tonsils and teeth.	Total children.	Condition of cervical glands.							
		Nonpalpable.		Palpable.		Enlarged.		Greatly enlarged.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Total.....	3,125	898	28.7	1,986	63.6	233	7.5	8	0.3
With decayed teeth or diseased tonsils.....	2,106	476	22.6	1,438	68.3	186	8.8	6	.3
Decayed teeth.....	1,700	407	23.9	1,155	67.9	133	7.8	5	.3
Diseased tonsils.....	85	24	28.2	56	65.9	5	5.9	1	.3
Both.....	321	45	14.0	227	70.7	48	15.0	1	.3
Without decayed teeth or diseased tonsils.....	1,019	422	41.4	548	53.8	47	4.6	2	.2

The highest per cent of "palpable" glands (58.3) was found among children in their fourth year. This was a considerable increase over the 48.9 per cent found among children in their third year. Only a slight diminution in palpability was noticeable in the succeeding age groups.

Definite "enlargement," sufficient to be considered pathological, was observed in 29.1 per cent of the cases; and all but about 15.7 per cent of this number showed an associated infection causing the enlargement.

"Enlarged" glands, with or without associated infection—while present in nearly 13 per cent at 2 to 3 years of age—showed numbers steadily increasing with age, and no tendency to diminution even during the seventh year. As with most other defects, there was a slightly higher per cent in boys.

The submaxillary and cervical glands were by far the most commonly "enlarged," and showed associated infection more frequently than any other group. While not so many children had "palpable" submaxillary glands (43 per cent) as had "palpable" cervical glands (63.6 per cent), a larger number—nearly three times as many—had "enlarged" submaxillary glands (20.9 per cent) than had "enlarged" cervical glands (7.5 per cent). A very definite form of infection, such as decayed teeth or diseased tonsils, was associated with 84.3 per cent of the cases of "enlarged" glands.

In 14 per cent of the children with both decayed teeth and diseased tonsils, the cervical glands were not even "palpable;" and 21.2 per cent of the children with these defects had "nonpalpable" submaxillary glands.

Inguinal glands were "palpable" in 1,028 children, or 32.9 per cent of all those included in the study, and "enlarged" in 49 children—36 boys and 13 girls. No associated infection was reported with any condition of this group of glands.

Twenty-one boys and 39 girls were found to have thyroid enlargement, a condition unusual for children of these ages, although fairly common at later ages in the Great Lakes region.

Apparently little significance can be attached to the findings in regard to the other gland groups. Occipital glands were "palpable" in only 21 cases (0.7 per cent) and "enlarged" in only 2. The axillary group of glands were "palpable" in 3.2 per cent of the cases, and enlarged in only 0.4 per cent. "Palpable" epitrochlear glands were reported in 2 boys.

Correlations to determine any existing relations between the condition of the glands and other physical factors were made. There appeared to be no connection between glandular enlargement and underweight; in fact, a higher percentage (20.1) of those 10 per cent or more underweight had normal glands than of those of average or above average weight (17.6). Similarly, a higher percentage (29.1) of "enlarged" glands was found in children of average weight, or above, than in those 10 per cent or more below average (27.4 per cent).

Of 243 pale or anemic children, 133 (54.7 per cent) had "palpable" glands and 98 (40.3 per cent) had "enlarged" glands.

Glandular defects showed more striking difference according to nationality than did other defects, being found in 32.5 per cent of the children of foreign-born parentage and in only 23.5 per cent of those of native parentage. The highest percentage having glandular defects (47) was found among the Lithuanians.

TABLE XX.—Condition of glands, by color and nationality of mother; children 2 to 7 years of age given physical examination.

Color and nationality of mother.	Total children.	Condition of glands.									
		Non-palpable.		Palpable.		Enlarged or greatly enlarged.					
						Total.		With associated infection.		Without associated infection.	
		Number.	Per cent. <sup>1</sup>	Number.	Per cent. <sup>1</sup>	Number.	Per cent. <sup>1</sup>	Number.	Per cent. <sup>1</sup>	Number.	Per cent. <sup>1</sup>
Total.....	3,125	550	17.6	1,667	53.3	908	29.1	765	24.5	143	4.6
White.....	3,047	544	17.9	1,617	53.1	886	29.1	752	24.7	134	4.4
Native.....	1,151	254	22.1	627	54.5	270	23.5	236	20.5	34	3.0
Foreign-born.....	1,896	290	15.3	990	52.2	616	32.5	516	27.2	100	5.3
Serbo-Croatian.....	321	39	12.1	168	52.3	114	35.5	96	29.9	18	5.6
Slovak.....	313	52	16.6	160	51.1	101	32.3	92	29.4	9	2.9
Polish.....	224	37	16.5	113	50.4	74	33.0	60	26.8	14	6.3
Magyar.....	176	18	10.2	102	58.0	56	31.8	44	25.0	12	6.8
Italian.....	157	16	10.2	94	59.9	47	29.9	32	20.4	15	9.6
German.....	139	26	18.7	74	53.2	39	28.1	34	24.5	5	3.6
Lithuanian.....	83	7	8.4	37	44.6	39	47.0	32	38.6	7	8.4
All other.....	483	95	19.7	242	50.1	146	30.2	126	26.1	20	4.1
Negro.....	71	5	7.0	46	64.8	20	28.2	12	16.9	8	11.3
Not reported.....	7	1	.....	4	.....	2	.....	1	.....	1	.....

<sup>1</sup> Not shown where base is less than 50.

Colored children showed a higher per cent of "palpable" glands than any other racial group; a per cent of "defective" glands midway between those of the children of foreign-born white parentage and of native white parentage; and a decided lack of "associated infection" with all degrees of enlargement.

#### LUNGS.

A comparatively small number of children showed symptoms of respiratory disease. Positive diagnoses on one examination were possible in only 11 cases (0.4 per cent), the majority of these being bronchitis. An additional 21 cases (0.7 per cent) were considered suspicious, and were referred for medical supervision. A slightly higher percentage (18.8) of diseased tonsils was found in children with lung disease (definite and suspected) than in those without such disease (12.9 per cent).

#### HEART.

A positive diagnosis of organic heart disease was possible in only 14 cases, or 0.4 per cent of all. A group of 85 cases (2.7 per cent) were reported as "suspected heart disease" and requiring observation, since it was impossible to make a definite diagnosis on only one examination. Functional murmurs without other heart symptoms were reported in 68 cases (2.2 per cent). Only 2 cases of functional murmur were reported as early as the third year, but the number steadily increased with age, reaching 25 during the seventh year.

#### SKIN.

Under this subject were included not only definite skin diseases but pediculosis as well. This latter condition far exceeded all other skin affections, being found in 4.6 per cent of all the children. Pediculosis was three times as frequent among girls as among boys, and its prevalence increased steadily with age, so that by far the larger number of cases was found among children over 5 years of age. The number of cases of pediculosis of the body was practically negligible.

Of the skin diseases, eczema was most common, occurring in 80 cases (2.6 per cent). There were also 67 cases of infected sores; 29 of ringworm, chiefly of scalp and face; 9 cases of scabies; and 8 cases of impetigo. With the exception of infected sores and ringworm these diseases were more commonly found in the later ages, i. e., those over 5 years.

Under "other conditions" were listed scars, with their causes when these could be ascertained. A surprisingly large number, 165, or 5.3 per cent, were found to have scars of one kind or another. "Unreported causes" was recorded for the majority, but the most commonly reported causes were burns (26.7 per cent) and operations (15.2 per cent). Doubtless many of the scars, the causes of which were unreported, were in fact the result of burns or other accidents.

Abnormal skin conditions were more common in the older children, 14.1 per cent in the seventh year or later as compared with 4.9 per cent during the third year.

No marked relation was shown between underweight and abnormal skin condition, but malnutrition, plus skin defects, was found to be accompanied by a high per cent of anemia. The increase in skin defects was from zero among the "excellent" to 21.6 per cent among the "good," 27.3 per cent among the "poor," and 60 per cent among the "very poor."

Children of foreign-born mothers were more commonly subject to abnormal skin conditions than those of native parents, the percentages being 13.2 and 4.9, respectively. The groups in which the percentage of this defect most nearly approached that of the native white group were the German, with 5.8 per cent; and the Polish, with 7.1 per cent; a maximum of 22.9 per cent was reached among the Italian and the Lithuanian.

Correlations with incomes show definitely that the children of the more prosperous families were freer from abnormal skin conditions than those in the lower-income groups; the percentage of children in whom such conditions were found decreased from 16.4 among families where the father earned less than \$850 to only 5.6 in the group where the fathers earned \$2,250 or more. Low standards of living, including lack of bathing facilities, ignorance as to proper care and habits of the body and proper food, etc., prevailed to a greater degree among the families of the low-income groups.

#### ABDOMEN.

Abdominal distension was most frequently observed in the younger children, being present in 19.8 per cent of those in their third year of age. A gradual decrease in the prevalence of this defect was noticeable in each succeeding age group. This condition was evenly distributed according to sex.

Distended abdomen was more commonly observed in children with rachitic defects (23.1 per cent) than in nonrachitic children (11 per cent).

TABLE XXI.—*Distended abdomen, by age and sex; children 2 to 7 years of age given physical examination.*

Age and sex.	Total children.	With distended abdomen.		Without distended abdomen.
		Number.	Per cent.	
Both sexes.....	3,125	423	13.5	2,702
2 years, under 3.....	511	101	19.8	410
3 years, under 4.....	496	75	15.1	421
4 years, under 5.....	549	70	12.8	479
5 years, under 6.....	667	77	11.5	590
6 years, under 7.....	682	74	10.9	608
7 years, under 8.....	220	26	11.8	194

TABLE XXI.—*Distended abdomen, by age and sex; children 2 to 7 years of age given physical examination—Concluded.*

Age and sex.	Total children.	With distended abdomen.		Without distended abdomen.
		Number.	Per cent.	
Boys.....	1,555	214	13.8	1,341
2 years, under 3.....	261	50	19.2	211
3 years, under 4.....	251	35	13.9	216
4 years, under 5.....	274	40	14.6	234
5 years, under 6.....	337	42	12.5	295
6 years, under 7.....	334	32	9.6	302
7 years, under 8.....	98	15	15.3	83
Girls.....	1,570	209	13.3	1,361
2 years, under 3.....	250	51	20.4	199
3 years, under 4.....	245	40	16.3	205
4 years, under 5.....	275	30	10.9	245
5 years, under 6.....	330	35	10.6	295
6 years, under 7.....	348	42	12.1	306
7 years, under 8.....	122	11	9.0	111

Of the children of average weight or above, 19.5 per cent had abdominal defect, while smaller percentages—11.4, 10.5, and 12.5—of the children in the underweight groups showed this defect.

There were 11 cases of enlarged liver—0.4 per cent of all examined—and none of enlarged spleen.

Hernias were found in 47 cases, 36 umbilical and 11 inguinal, only 1 of the latter variety being in a girl. Four boys had operations for this condition.

**BONY AND MUSCULAR SYSTEMS.**

A simple enumeration of bony and muscular defects is given in General Table 7, page 69. One defect of the bony and muscular system appeared in 41.9 per cent of the children. Distribution of these defects by age showed a gradual increase from 24.9 per cent in the third year to 56.2 per cent in the seventh year.

TABLE XXII.—*Defects of bony and muscular system, by age and sex; children 2 to 7 years of age given physical examination.*

Age and sex.	Total children.	With defects of bony and muscular system.		Without defects of bony and muscular system.
		Number.	Per cent.	
Both sexes.....	3,125	1,308	41.9	1,817
2 years, under 3.....	511	127	24.9	384
3 years, under 4.....	496	144	29.0	352
4 years, under 5.....	549	204	37.2	345
5 years, under 6.....	667	324	48.6	343
6 years, under 7.....	682	383	56.2	299
7 years, under 8.....	220	126	57.3	94
Boys.....	1,555	709	45.6	846
2 years, under 3.....	261	68	26.1	193
3 years, under 4.....	251	76	30.3	175
4 years, under 5.....	274	111	40.5	163

TABLE XXII.—*Defects of bony and muscular system, by age and sex; children 2 to 7 years of age given physical examination—Concluded.*

Age and sex.	Total children.	With defects of bony and muscular system.		Without defects of bony and muscular system.
		Number.	Percent.	
5 years, under 6 .....	337	183	54.3	154
6 years, under 7 .....	334	208	62.3	126
7 years, under 8 .....	98	63	64.3	35
Girls .....	1,570	599	38.2	971
2 years, under 3 .....	250	59	23.6	191
3 years, under 4 .....	245	68	27.8	177
4 years, under 5 .....	275	93	33.8	182
5 years, under 6 .....	330	141	42.7	189
6 years, under 7 .....	348	175	50.3	173
7 years, under 8 .....	122	63	51.6	59

On the whole, the percentage of boys (45.6) with defects of the bony and muscular systems, exceeded that of girls (38.2).

In general, the incidence of these defects in the various weight groups was not sufficiently uniform to suggest any definite correlation with weight. (See general Table 5, p. 68.)

#### **Bony defects of rachitic origin.**

Since a large number of the bony defects were considered to be of rachitic origin, tabulations based on this causative factor were made.

Bony defects tabulated as "unquestionably" the result of rickets were: Beaded ribs, Harrison's groove, enlarged epiphyses, pigeon breast, craniotabes, and lumbar kyphosis if it was accompanied by one of the group of "probable signs" of rickets such as large square head or open fontanelle after 18 months of age. Bowlegs or knock-knees were considered as merely additional evidence of rickets and, unless other rachitic signs appeared with them, were disregarded. In combination with lumbar kyphosis they were called unquestionable signs of rickets.

Three hundred and eighty-eight children (12.4 per cent) were considered as having defects definitely the result of rickets, while an additional 79 children (2.5 per cent) had defects "probably of rachitic origin," bringing the total of those having defects possibly due to early rickets to 14.9 per cent.

Rickets is usually conceded to be a disease of infancy, the symptoms of which disappear early under proper dietary and hygienic conditions; hence the prevalence and persistence of these excessively high percentages probably due to rickets lead to the inference that the corrective measures of diet, hygiene, and environment had not entered into the lives of this preschool group. This conclusion is perhaps further substantiated by the fact that these defects showed



no tendency to diminish, even in the older children, but increased steadily.

Correlations between bony defects of rachitic origin and the condition of the teeth showed a higher per cent (75.2) of decayed teeth in the children with such bony defects than in those without (62.8).

Slightly more than half (54.2 per cent) of the children with rachitic bone defects were found to have defective tonsils as compared with 51.7 per cent of children without such defects.

Children without rachitic bone defects had a much higher per cent of nonpalpable lymphatic glands (19.4 per cent) than those with such defects (7.3 per cent).

The prevalence of rachitic defects was greater among the children of foreign-born white parentage (17.7 per cent) than among those of native white parentage (10.4 per cent). Of the former, the Serbo-Croatians had the highest per cent (22.1 per cent). Contrary to the general impression, the colored children, although a small group, showed only 14.1 per cent with rachitic defects, a per cent slightly less than the average for the entire group (14.9 per cent).

While rachitic defects appeared to be slightly associated with underweight, their incidence increased only from 13.1 per cent in the "above average" group to 18.8 per cent in the group most seriously underweight. (See general Table 5, p. 68.) On the other hand, only 12.2 per cent of the children with rachitic defects as compared with 9.3 per cent of the nonrachitic showed 10 per cent or more deviation from average weight for height.

#### **Postural defects.**

Included in this group were the defects due to lack of muscular development, namely, round shoulders, winged scapulæ, scoliosis and lordosis, and, when not associated with rickets, bowlegs and knock-knees.

The total number of children with one or more postural defects was 793, or 25.4 per cent of all those examined. In children 6 to 7 years of age the number increased to over one-third of the total. This at first appears to be an excessively high percentage; but to what extent the conditions may be interpreted as actual defects is perhaps debatable, considering that between the ages of 2 and 6 years muscular development is poor and muscle tonus practically lacking. This characteristic lack of muscular development probably explains in part the frequency of winged scapulæ in this study. The percentage of children having this defect was 14.5 for the whole group, and was noticeably higher after the fourth year. The increase in scoliosis appeared more prominently after the fifth year.

Postural defects, on the whole, appeared to bear some relation to underweight; for 28.7 per cent of the children 10 per cent or more

below average weight for height had one or more postural defects, as contrasted with 20.4 per cent of those whose weight was average or above.

TABLE XXIII.—*Postural defects, by age and sex; children 2 to 7 years of age given physical examination.*

Age and sex.	Total children.	With postural defects.		Without postural defects.
		Number.	Per cent.	
Both sexes.....	3, 125	793	25. 4	2, 332
2 years, under 3.....	511	56	11. 0	455
3 years, under 4.....	496	68	13. 7	428
4 years, under 5.....	549	117	21. 3	432
5 years, under 6.....	667	220	33. 0	447
6 years, under 7.....	682	255	37. 4	427
7 years, under 8.....	220	77	35. 0	143
Boys.....	1, 555	418	26. 9	1, 137
2 years, under 3.....	261	30	11. 5	231
3 years, under 4.....	251	40	15. 9	211
4 years, under 5.....	274	56	20. 4	218
5 years, under 6.....	337	125	37. 1	212
6 years, under 7.....	334	131	39. 2	203
7 years, under 8.....	98	36	36. 7	62
Girls.....	1, 570	375	23. 9	1, 195
2 years, under 3.....	250	26	10. 4	224
3 years, under 4.....	245	28	11. 4	217
4 years, under 5.....	275	61	22. 2	214
5 years, under 6.....	330	95	28. 8	235
6 years, under 7.....	348	124	35. 6	224
7 years, under 8.....	122	41	33. 6	81

Among the colored the percentage of postural defects was very high—52.1; among the children of native white parentage it was 21.8, and among those of foreign-born white parentage it was 26.6.

The influence of environment and living standards upon development as reflected in faulty posture is shown by the incidence of the highest per cent of postural defects in the lower wage group; this per cent was 27.6 in families whose incomes were less than \$1,450, as contrasted with 22.1 per cent in families whose incomes were \$1,450 or over. (See General table 4, p. 67.)

### Arch measurements.

Since there appeared to be no standard for grading flat foot, and since anatomical data regarding arches in children's feet were notably lacking, the suggestion of a prominent orthopedist that the study include a measurement of the height of the arches in children was carried out. (See instructions, p. 20.) The results are herewith given without any attempt at interpretation, since obviously other and more detailed investigations on the subject must follow before the material in this report can be evaluated.

Measurements were made on 3,064 children, and in only 65 cases were the arch heights found to be unequal in the two feet. In computing median arch measurements these 65 cases were discarded.

The accompanying table gives median arch measurements according to sex and age:

*Median arch measurements.*

Age.	Both sexes.	Boys.	Girls.
	Inches.	Inches.	Inches.
2 years, under 3.....	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
3 years, under 4.....	1	1	1
4 years, under 5.....	1	1	1
5 years, under 6.....	1	1	1
6 years, under 7.....	$1\frac{1}{8}$	$1\frac{1}{8}$	1
7 years, under 8.....	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$

The increase in arch height with age probably parallels the muscular development in the feet, which apparently increases with use. Careful observations were made and recorded as to the relation of the axes of the foot and leg while the child was walking. Of all the children 81.3 per cent had what is commonly known as the "straight" type of foot, i. e., they toed straight ahead, the axes of the foot and leg making a right angle; 10.3 per cent were of the "inflared" type with the foot deflected in; while 6.9 per cent were the "outflared" type with the foot deflected out.

Correlations between the position of the foot and the median height of the arch indicate that the deflections in and out increased with the height of the arch, as the accompanying figures show:

*Median arch measurements.*

Age.	Inflare.	Outflare.	Straight foot.
	Inches.	Inches.	Inches.
2 years, under 3.....	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{3}{4}$
3 years, under 4.....	1	1	1
4 years, under 5.....	1	1	1
5 years, under 6.....	1	1	1
6 years, under 7.....	$1\frac{1}{8}$	$1\frac{1}{8}$	1
7 years, under 8.....	$1\frac{1}{4}$	$1\frac{1}{8}$	1

### NERVOUS SYSTEM.

The prevalence of defects of the nervous system is shown in General Table 1.<sup>18</sup> Of the entire group, nervous defects were noted in 75 children—only 2.4 per cent. Individual defects were too few to be of definite value statistically, and the clinical findings are equally valueless without a more detailed and thorough examination than was possible in this study.

<sup>18</sup> See p. 65.

Functional speech defects were noted in 1.7 per cent of the children, practically equally distributed according to sex. They were chiefly stammering, stuttering, and lisping, with a few cases of poor articulation.

#### MENTAL CONDITION.

No mental tests were conducted in connection with this study. If the observations of the examining physicians or nurses led to even a suspicion of abnormality, the observations were supplemented by information gained from the teacher, the mother, or the school physician who conducted mental tests. Nineteen apparent mental defectives and 18 suspected cases came under the observation of the physicians during the course of the study.

#### GENITALIA.

An astonishingly high per cent of genital defects was found in boys, due almost entirely to adherent or contracted prepuce, there being 437 cases (28.1 per cent) of the former and 289 (18.6 per cent) of the latter. There were recorded only 22 cases (1.4 per cent) of other abnormalities of the genitalia than of the prepuce.

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The data from this study are submitted merely as the results of careful routine physical examinations based upon somewhat standardized methods.

No attempt has been made to draw conclusions, since the findings point very definitely to the need for further consecutive study of the child before correlations between existing physical defects and their possible causes may be determined. Studies of racial, economic, and environmental factors, breast feeding, growth, intercurrent diseases, diet, sleep, and recreation, correlated with the objective findings of periodic physical examinations covering the period from birth to school age, would undoubtedly add a great deal to the present knowledge of the physical development of the child and the factors which modify it. Such studies would also in time afford a means of evaluating present efforts in the field of child hygiene.

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APPENDIXES.

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APPENDIX

## APPENDIX A. GENERAL TABLES ON PHYSICAL FINDINGS OF THE PRESCHOOL CHILD.

TABLE 1.—Prevalence of defects, by sex; children 2 to 7 years of age given physical examination.

Summary of defects.	Both sexes.		Boys.		Girls.	
	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.
Total .....	3,125	100.0	1,555	100.0	1,570	100.0
Without defects.....	149	4.8	48	3.1	101	6.4
With defects.....	2,976	95.2	1,507	96.9	1,469	93.6
Underweight (10 per cent and over).....	303	9.7	140	9.0	163	10.4
Anemia.....	243	7.8	113	7.3	130	8.3
Head defects.....	163	5.2	105	6.8	58	3.7
Eye defects.....	1,890	28.5	437	28.1	453	28.9
Defective vision.....	738	<sup>2</sup> 36.1	355	<sup>2</sup> 35.6	383	<sup>2</sup> 36.6
Other defect.....	245	7.8	127	8.2	118	7.5
Ear defects.....	<sup>3</sup> 48	1.5	30	1.9	18	1.1
Defective hearing.....	25	<sup>4</sup> 1.4	14	<sup>4</sup> 1.6	11	<sup>4</sup> 1.2
Other defect.....	25	.8	17	1.1	8	.5
Mouth defects.....	2,091	66.9	1,043	67.1	1,048	66.8
Nasopharyngeal defects.....	2,157	69.0	1,118	71.9	1,039	66.2
Enlarged glands.....	908	29.1	489	31.4	419	26.7
Heart defects.....	99	3.2	48	3.1	51	3.2
Lung defects.....	32	1.0	21	1.4	11	.7
Abnormal skin condition.....	318	10.2	137	8.8	181	11.5
Abdominal defects.....	464	14.8	234	15.0	230	14.6
Defects of bony and muscular system.....	1,308	41.9	709	45.6	599	38.2
Bony defects of rachitic origin.....	467	14.9	304	19.5	163	10.4
Postural defects.....	793	25.4	418	26.9	375	23.9
Defects of nervous system.....	75	2.4	42	2.7	33	2.1
Defects of mentality.....	37	1.2	26	1.7	11	.7
Defects of genitalia.....	769	24.6	732	47.1	37	2.4

<sup>1</sup> In 1,081 cases vision was not tested; hence this number does not include all possible cases of defective vision.

<sup>2</sup> Per cent based on 2,044 cases tested, 998 boys and 1,046 girls.

<sup>3</sup> In 1,279 cases hearing was not tested; hence this number does not include all possible cases of defective hearing.

<sup>4</sup> Per cent based on 1,846 cases tested, 901 boys and 945 girls.

TABLE 2.—Specified defects, by age and sex; children 2 to 7 years of age given physical examination.

Age and sex.	Total children.	With anemia.		Underweight (10 per cent and over).		With decayed teeth.		With defective tonsils.		With adenoids, positive and suspected.	
		Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.
Both sexes.....	3,125	243	7.8	303	9.7	2,021	64.7	1,626	52.0	1,257	40.2
2 years, under 3.....	511	5	1.0	85	16.6	108	21.1	203	39.7	68	13.3
3 years, under 4.....	496	3	.6	59	11.9	218	44.0	254	51.2	123	24.8
4 years, under 5.....	549	21	3.8	56	10.2	364	66.3	319	58.1	208	37.9
5 years, under 6.....	667	67	10.0	44	6.6	533	79.9	377	56.5	363	54.4
6 years, under 7.....	682	114	16.7	48	7.0	598	87.7	365	53.5	389	57.0
7 years, under 8.....	220	33	15.0	11	5.0	200	90.9	108	49.1	106	48.2

TABLE 2.—Specified defects, by age and sex; children 2 to 7 years of age given physical examination—Concluded.

Age and sex.	Total children.	With anemia.		Under weight (10 per cent and over).		With decayed teeth.		With decayed tonsils.		With adenoids, positive and suspected.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Boys.....	1,555	113	7.3	140	9.0	1,007	64.8	836	53.8	676	43.5
2 years, under 3.....	261	2	.8	43	16.5	57	21.8	110	42.1	41	15.7
3 years, under 4.....	251	1	.4	29	11.6	115	45.8	132	52.6	69	27.5
4 years, under 5.....	274	10	3.6	28	10.2	182	66.4	163	59.5	109	39.8
5 years, under 6.....	337	32	9.5	16	4.7	273	81.0	198	58.8	206	61.1
6 years, under 7.....	334	53	15.9	20	6.0	293	87.7	183	54.8	205	61.4
7 years, under 8.....	98	15	15.3	4	4.1	87	88.8	50	51.0	46	46.9
Girls.....	1,570	130	8.3	163	10.4	1,014	64.6	790	50.3	581	37.0
2 years, under 3.....	250	3	1.2	42	16.8	51	20.4	93	37.2	27	10.8
3 years, under 4.....	245	2	.8	30	12.2	103	42.0	122	49.8	54	22.0
4 years, under 5.....	275	11	4.0	28	10.2	182	66.2	156	56.7	99	36.0
5 years, under 6.....	330	35	10.6	28	8.5	260	78.8	179	54.2	157	47.6
6 years, under 7.....	348	61	17.5	28	8.0	305	87.6	182	52.3	184	52.9
7 years, under 8.....	122	18	14.8	7	5.7	113	92.6	58	47.5	60	49.2

Age and sex.	With enlarged glands.		With abnormal skin condition.		With bony and muscular defects.					
					Total.		Of rachitic origin.		Postural.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Both sexes.....	908	29.1	318	10.2	1,308	41.9	467	14.9	793	25.4
2 years, under 3.....	66	12.9	25	4.9	127	24.9	54	10.6	56	11.0
3 years, under 4.....	76	15.3	27	5.4	144	29.0	42	8.5	68	13.7
4 years, under 5.....	150	27.3	50	9.1	204	37.2	73	13.3	117	21.3
5 years, under 6.....	250	37.5	80	12.0	324	48.6	106	15.9	220	33.0
6 years, under 7.....	265	38.9	96	14.1	383	56.2	148	21.7	255	37.4
7 years, under 8.....	101	45.9	40	18.2	126	57.3	44	20.0	77	35.0
Boys.....	489	31.4	137	8.8	708	45.6	304	19.5	418	26.9
2 years, under 3.....	31	11.9	11	4.2	68	26.1	33	12.6	30	11.5
3 years, under 4.....	45	17.9	16	6.4	76	30.3	22	8.8	40	15.9
4 years, under 5.....	82	29.9	23	8.4	111	40.5	48	17.5	56	20.4
5 years, under 6.....	136	40.4	38	11.3	183	54.3	75	22.3	125	37.1
6 years, under 7.....	148	44.3	32	9.6	208	62.3	98	29.3	131	39.2
7 years, under 8.....	47	48.0	17	17.3	63	64.3	28	28.6	36	36.7
Girls.....	419	26.7	181	11.5	599	38.2	163	10.4	375	23.9
2 years, under 3.....	35	14.0	14	5.6	59	23.6	21	8.4	26	10.4
3 years, under 4.....	31	12.7	11	4.5	68	27.8	20	8.2	28	11.4
4 years, under 5.....	68	24.7	27	9.8	93	33.8	25	9.1	61	22.2
5 years, under 6.....	114	34.5	42	12.7	141	42.7	31	9.4	95	28.8
6 years, under 7.....	117	33.6	64	18.4	175	50.3	50	14.4	124	35.6
7 years, under 8.....	54	44.3	23	18.9	63	51.6	16	13.1	41	33.6



TABLE 3.—Specified defects, by color and nationality of mother; children 2 to 7 years of age given physical examination.

Defect.	Total children.		Children of—						Mothers whose nationality was not reported. <sup>1</sup>
			Native white mothers.		Foreign-born white mothers.		Negro mothers.		
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	
Total.....	3,125	100.0	1,151	100.0	1,896	100.0	71	100.0	7
Anemia.....	243	7.8	71	6.2	164	8.6	8	11.3	.....
Underweight (10 per cent and over).....	303	9.7	114	9.9	182	9.6	7	9.9	.....
Eye disease or defect other than of vision.....	245	7.8	86	7.5	158	8.3	1	1.4	.....
Defective tonsils.....	1,626	52.0	612	53.2	976	51.5	34	47.9	4
Adenoids (definite and suspected).....	1,257	40.2	473	41.1	761	40.1	22	31.0	1
Enlarged glands.....	908	29.1	270	23.5	616	32.5	20	28.2	2
Abnormal skin condition.....	318	10.2	56	4.9	250	13.2	12	16.9	.....
Bony defects of rachitic origin.....	467	14.9	120	10.4	336	17.7	10	14.1	1
Postural defects.....	793	25.4	251	21.8	505	26.6	37	52.1	.....

<sup>1</sup> Per cent not shown where base is less than 50.

TABLE 4.—Specified defects, by earnings of chief breadwinner; children 2 to 7 years of age given physical examination.

Defect.	Total children.		Earnings of chief breadwinner.					
			Under \$1,450.		\$1,450 and over.		Not reported.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Total.....	3,125	100.0	1,767	100.0	1,178	100.0	180	100.0
Anemia.....	243	7.8	149	8.4	76	6.5	18	10.0
Underweight (10 per cent and over).....	303	9.7	176	10.0	111	9.4	16	8.9
Eye disease or defect other than of vision.....	245	7.8	141	8.0	87	7.4	17	9.4
Defective tonsils.....	1,626	52.0	938	53.1	602	51.1	86	47.8
Adenoids (definite and suspected).....	1,257	40.2	714	40.4	476	40.4	67	37.2
Enlarged glands.....	908	29.1	533	30.2	322	27.3	53	29.4
Abnormal skin condition.....	318	10.2	214	12.1	80	6.8	24	13.3
Bony defects of rachitic origin.....	467	14.9	296	16.8	149	12.6	22	12.2
Postural defects.....	793	25.4	487	27.6	260	22.1	46	25.6

## PHYSICAL STATUS OF PRESCHOOL CHILDREN.

TABLE 5.—Per cent of children with specified defects, by deviation from average weight for height; children 2 to 7 years of age given physical examination.

Defect.	Total children.	Relation of weight to height.			
		Average and above.	Below average.		
			Less than 7 per cent.	7 per cent, less than 10.	10 per cent and over.
Total.....	100.0	100.0	100.0	100.0	100.0
Anemia.....	7.8	5.5	7.9	10.8	13.9
Eye disease.....	5.0	4.4	5.4	6.2	5.0
Decayed teeth.....	64.7	66.7	66.9	61.0	51.2
Naso-pharyngeal defects.....	69.0	70.5	70.0	64.1	64.0
Defective tonsils, no adenoids.....	22.8	23.1	21.9	21.4	26.1
Adenoids, no defective tonsils.....	11.0	11.8	11.8	9.0	6.6
Defective tonsils and adenoids.....	29.3	30.4	29.4	28.2	25.1
Diseased tonsils.....	13.0	13.0	13.0	15.2	10.9
Other.....	6.0	5.2	6.9	5.6	6.3
Enlarged glands.....	29.1	29.1	29.1	30.3	27.4
Abdominal defects.....	14.8	19.5	11.4	10.5	12.5
Defects of bony and muscular system.....	41.9	37.6	45.2	42.1	47.2
Bony defects of rachitic origin.....	14.9	13.1	16.2	14.2	18.8
Postural defects.....	25.4	20.4	28.6	30.7	28.7

TABLE 6.—Specified skin diseases, by age and sex; children 2 to 7 years of age given physical examination.

Age and sex.	Total children.	Children with—											
		Eczema.		Pediculosis.		Impetigo.		Infected sores.		Ringworm.		Scabies.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Both sexes.....	3,125	80	2.6	145	4.6	8	0.3	67	2.1	29	0.9	9	0.3
2 years, under 3.....	511	6	1.2	2	.4	2	.4	11	2.2	5	1.0	.....	.....
3 years, under 4.....	496	2	.4	6	1.2	3	.6	11	2.2	6	1.2	.....	.....
4 years, under 5.....	549	16	2.9	12	2.2	.....	.....	17	3.1	3	.5	4	.7
5 years, under 6.....	667	21	3.1	40	6.0	.....	.....	12	1.8	7	1.0	2	.3
6 years, under 7.....	682	27	4.0	56	8.2	3	.4	12	1.8	6	.9	3	.4
7 years, under 8.....	220	8	3.6	29	13.2	.....	.....	4	1.8	2	.9	.....	.....
Boys.....	1,555	49	3.2	35	2.3	3	.2	35	2.3	18	1.2	5	.3
2 years, under 3.....	261	2	.8	1	.4	1	.4	6	2.3	1	.4	.....	.....
3 years, under 4.....	251	2	.8	1	.4	2	.8	6	2.4	6	2.4	.....	.....
4 years, under 5.....	274	9	3.3	3	1.1	.....	.....	8	2.9	2	.7	2	.7
5 years, under 6.....	337	13	3.9	15	4.5	.....	.....	6	1.8	3	.9	1	.3
6 years, under 7.....	334	19	5.7	5	1.5	.....	.....	6	1.8	4	1.2	2	.6
7 years, under 8.....	98	4	4.1	10	10.2	.....	.....	3	3.1	2	2.0	.....	.....
Girls.....	1,570	31	2.0	110	7.0	5	.3	32	2.0	11	.7	4	.3
2 years, under 3.....	250	4	1.6	1	.4	1	.4	5	2.0	4	1.6	.....	.....
3 years, under 4.....	245	.....	.....	5	2.0	1	.4	5	2.0	.....	.....	.....	.....
4 years, under 5.....	275	7	2.5	9	3.3	.....	.....	9	3.3	1	.4	2	.7
5 years, under 6.....	330	8	2.4	25	7.6	.....	.....	6	1.8	4	1.2	1	.3
6 years, under 7.....	348	8	2.3	51	14.7	3	.9	6	1.7	2	.6	1	.3
7 years, under 8.....	122	4	3.3	19	15.6	.....	.....	1	.8	.....	.....	.....	.....

TABLE 7.—Condition of specified glands, by sex; children 2 to 7 years of age given physical examination.

Condition of glands, and sex.	Children with specified glands in specified condition.													
	Occipital glands.		Submaxillary glands.		Cervical glands.		Axillary glands.		Epitrochlear glands.		Inguinal glands.		Thyroid gland.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	3,125	100.0	3,125	100.0	3,125	100.0	3,125	100.0	3,125	100.0	3,125	100.0	3,125	100.0
Glands:														
Nonpalpable.....	3,102	99.3	1,076	34.4	898	28.7	3,009	96.3	3,123	99.9	2,046	65.5	3,065	98.1
Palpable.....	21	.7	1,345	43.0	1,986	63.6	101	3.2	2	.1	1,028	32.9		
Enlarged.....	2	.1	654	20.9	233	7.5	14	.4			49	1.6	58	1.9
No associated infection.....	1		47	1.5	33	1.1	12	.4			49	1.6	58	1.9
With associated infection.....	1		607	19.4	200	6.4	2	.1						
Greatly enlarged.....			50	1.6	8	.3	1				2	.1	2	.1
No associated infection.....			3	.1	1		1				2	.1	2	.1
With associated infection.....			47	1.5	7	.2								
Boys.....	1,555	100.0	1,555	100.0	1,555	100.0	1,555	100.0	1,555	100.0	1,555	100.0	1,555	100.0
Glands:														
Nonpalpable.....	1,538	98.9	516	33.2	417	26.8	1,488	95.7	1,553	99.9	944	60.7	1,534	98.6
Palpable.....	16	1.0	656	42.2	995	64.0	55	3.5	2	.1	573	36.8		
Enlarged.....	1	.1	354	22.8	137	8.8	11	.7			36	2.3	20	1.3
No associated infection.....	1	.1	23	1.5	20	1.3	10	.6			36	2.3	20	1.3
With associated infection.....			331	21.3	117	7.5	1	.1						
Greatly enlarged.....			29	1.9	6	.4	1	.1			2	.1	1	.1
No associated infection.....			3	.2	1	.1	1	.1			2	.1	1	.1
With associated infection.....			26	1.7	5	.3								
Girls.....	1,570	100.0	1,570	100.0	1,570	100.0	1,570	100.0	1,570	100.0	1,570	100.0	1,570	100.0
Glands:														
Nonpalpable.....	1,564	99.6	560	35.7	481	30.6	1,521	96.9	1,570	100.0	1,102	70.2	1,531	97.5
Palpable.....	5	.3	689	43.9	991	63.1	46	2.9			455	29.0		
Enlarged.....	1	.1	300	19.1	96	6.1	3	.2			13	.8	38	2.4
No associated infection.....			24	1.5	13	.8	2	.1			13	.8	38	2.4
With associated infection.....	1	.1	276	17.6	83	5.3	1	.1						
Greatly enlarged.....			21	1.3	2	.1							1	.1
No associated infection.....													1	.1
With associated infection.....			21	1.3	2	.1								

TABLE 8.—Specified defects of bony and muscular system, by age and sex; children 2 to 7 years of age given physical examination.

Age and sex.	Total children.	Children with defects of bony and muscular system.																			
		Beaded ribs.		Harrison's groove.		Enlarged epiphyses.		Pigeon breast.		Round shoulders.		Winged scapula.		Scoliosis.		Lordosis.		Knock-knee.		Bowlegs.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Both sexes.....	3,125	31	1.0	175	5.6	209	6.7	53	1.7	103	3.3	452	14.5	57	1.8	16	0.5	194	6.2	300	9.6
2 years, under 3.....	511	4	.8	20	3.9	18	3.5	4	.8	4	.8	3	.6	2	.4	2	.4	21	4.1	54	10.6
3 years, under 4.....	496	7	1.4	16	3.2	19	3.8	5	1.0	9	1.8	9	1.8	3	.6	2	.4	23	4.6	43	8.7
4 years, under 5.....	549	6	1.1	32	5.8	34	6.2	7	1.3	21	3.8	56	10.2	3	.5	5	.9	38	6.9	48	8.7
5 years, under 6.....	667	5	.7	42	6.3	47	7.0	14	2.1	31	4.6	142	21.3	17	2.5	2	.3	60	9.0	70	10.5
6 years, under 7.....	682	8	1.2	50	7.3	66	9.7	19	2.8	31	4.5	187	27.4	24	3.5	3	.4	40	5.9	52	7.6
7 years, under 8.....	220	1	.5	15	6.8	25	11.4	4	1.8	7	3.2	55	25.0	8	3.6	2	.9	12	5.5	33	15.0
Boys.....	1,555	15	1.0	112	7.2	146	9.4	38	2.4	62	4.0	238	15.3	27	1.7	10	.6	92	5.9	193	12.4
2 years, under 3.....	261	2	.8	13	5.0	11	4.2	4	1.5	2	.8	1	.4	1	.4	1	.4	10	3.8	31	11.9
3 years, under 4.....	251	2	.8	9	3.6	12	4.8	4	1.6	7	2.8	6	2.4	1	.4	2	.8	14	5.6	28	11.2
4 years, under 5.....	274	5	1.8	18	6.6	23	8.4	6	2.2	10	3.6	25	9.1	2	.7	5	1.8	16	5.8	26	9.5
5 years, under 6.....	337	3	.9	31	9.2	37	11.0	6	1.8	18	5.3	83	24.6	8	2.4	1	.3	29	8.6	51	15.1
6 years, under 7.....	334	3	.9	33	9.9	45	13.5	15	4.5	21	6.3	96	28.7	13	3.9	-----	-----	19	5.7	34	10.2
7 years, under 8.....	98	-----	-----	8	8.2	18	18.4	3	3.1	4	4.1	27	27.6	2	2.0	1	1.0	4	4.1	23	23.5
Girls.....	1,570	16	1.0	63	4.0	63	4.0	15	1.0	41	2.6	214	13.6	30	1.9	6	.4	102	6.5	107	6.8
2 years, under 3.....	250	2	.8	7	2.8	7	2.8	-----	-----	2	.8	2	.8	1	.4	1	.4	11	4.4	23	9.2
3 years, under 4.....	245	5	2.0	7	2.9	7	2.9	1	.4	2	.8	3	1.2	2	.8	-----	-----	9	3.7	15	6.1
4 years, under 5.....	275	1	.4	14	5.1	11	4.0	1	.4	11	4.0	31	11.3	1	.4	-----	-----	22	8.0	22	8.0
5 years, under 6.....	330	2	.6	11	3.3	10	3.0	8	2.4	13	3.9	59	17.9	9	2.7	1	.3	31	9.4	19	5.8
6 years, under 7.....	348	5	1.4	17	4.9	21	6.0	4	1.1	10	2.9	91	26.1	11	3.2	3	.9	21	6.0	18	5.2
7 years, under 8.....	122	1	.8	7	5.7	7	5.7	1	.8	3	2.5	28	23.0	6	4.9	1	.8	8	6.6	10	8.2

TABLE 9.—Relation of weight to height, by age and sex; children 2 to 7 years of age given physical examination.

Relation of weight to height and sex.	Total children.		2 years, under 3.		3 years, under 4.		4 years, under 5.	
	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.
Both sexes.....	3, 125	100.0	511	100.0	496	100.0	549	100.0
Weight for height:								
Average and above.....	1, 319	42.2	188	36.8	194	39.1	223	40.6
Below average.....	1, 806	57.8	323	63.2	302	60.9	326	59.4
Less than 7 per cent.....	1, 180	37.8	172	33.7	184	37.1	222	40.4
7 per cent, less than 10.....	323	10.3	66	12.9	59	11.9	48	8.7
10 per cent and over.....	303	9.7	85	16.6	59	11.9	56	10.2
Boys.....	1, 555	100.0	261	100.0	251	100.0	274	100.0
Weight for height:								
Average and above.....	618	39.7	95	36.4	94	37.5	99	36.1
Below average.....	937	60.3	166	63.6	157	62.5	175	63.9
Less than 7 per cent.....	627	40.3	91	34.9	95	37.8	119	43.4
7 per cent, less than 10.....	170	10.9	32	12.3	33	13.1	28	10.2
10 per cent and over.....	140	9.0	43	16.5	29	11.6	28	10.2
Girls.....	1, 570	100.0	250	100.0	245	100.0	275	100.0
Weight for height:								
Average and above.....	701	44.6	93	37.2	100	40.8	124	45.1
Below average.....	869	55.4	157	62.8	145	59.2	151	54.9
Less than 7 per cent.....	553	35.2	81	32.4	89	36.3	103	37.5
7 per cent, less than 10.....	153	9.7	34	13.6	26	10.6	20	7.3
10 per cent and over.....	163	10.4	42	16.8	30	12.2	28	10.2

Relation of weight to height and sex.	5 years, under 6.		6 years, under 7.		7 years, under 8.	
	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.	Num-ber.	Per cent distri-bution.
Both sexes.....	667	100.0	682	100.0	220	100.0
Weight for height:						
Average and above.....	284	42.6	320	46.9	110	50.0
Below average.....	383	57.4	362	53.1	110	50.0
Less than 7 per cent.....	277	41.5	239	35.0	86	39.1
7 per cent, less than 10.....	62	9.3	75	11.0	13	5.9
10 per cent and over.....	44	6.6	48	7.0	11	5.0
Boys.....	337	100.0	334	100.0	98	100.0
Weight for height:						
Average and above.....	135	40.1	147	44.0	48	49.0
Below average.....	202	59.9	187	56.0	50	51.0
Less than 7 per cent.....	152	45.1	132	39.5	38	38.8
7 per cent, less than 10.....	34	10.1	35	10.5	8	8.2
10 per cent and over.....	16	4.7	20	6.0	4	4.1
Girls.....	330	100.0	348	100.0	122	100.0
Weight for height:						
Average and above.....	149	45.2	173	49.7	62	50.8
Below average.....	181	54.8	175	50.3	60	49.2
Less than 7 per cent.....	125	37.9	107	30.7	48	39.3
7 per cent, less than 10.....	28	8.5	40	11.5	5	4.1
10 per cent and over.....	28	8.5	28	8.0	7	5.7

TABLE 10.—Relation of weight to height, by color and nationality of mother; children 2 to 7 years of age given physical examination.

Color and nationality of mother.	Total children.	Relation of weight to height.									
		Average and above.		Below average.							
				Total.		Less than 7 per cent.		7 per cent, less than 10.		10 per cent and over.	
		Num-ber.	Per cent. <sup>1</sup>	Num-ber.	Per cent. <sup>1</sup>	Num-ber.	Per cent. <sup>1</sup>	Num-ber.	Per cent. <sup>1</sup>	Num-ber.	Per cent. <sup>1</sup>
Total.....	3,125	1,319	42.2	1,806	57.8	1,180	37.8	323	10.3	303	9.7
White.....	3,047	1,284	42.1	1,763	57.9	1,150	37.7	317	10.4	296	9.7
Native.....	1,151	466	40.5	685	59.5	439	38.1	132	11.5	114	9.9
Foreign-born.....	1,896	818	43.1	1,078	56.9	711	37.5	185	9.8	182	9.6
Serbo-Croatian.....	321	144	44.9	177	55.1	121	37.7	28	8.7	28	8.7
Slovak.....	313	102	32.6	211	67.4	137	43.8	40	12.8	34	10.9
Polish.....	224	90	40.2	134	59.8	89	39.7	22	9.8	23	10.3
Magyar.....	176	76	43.2	100	56.8	66	37.5	23	13.1	11	6.3
Italian.....	157	89	56.7	68	43.3	52	33.1	7	4.5	9	5.7
German.....	139	58	41.7	81	58.3	49	35.3	11	7.9	21	15.1
Lithuanian.....	83	47	56.6	36	43.4	22	26.5	8	9.6	6	7.2
All other.....	483	212	43.9	271	56.1	175	36.2	46	9.5	50	10.4
Negro.....	71	33	46.5	38	53.5	26	36.6	5	7.0	7	9.9
Not reported.....	7	2	.....	5	.....	4	.....	1	.....	.....	.....

<sup>1</sup> Not shown where base is less than 50.

TABLE 11.—Prevalence of specified defects, by deviation from average weight for height; children 2 to 7 years of age given physical examination.

Deviation from average weight for height. <sup>1</sup>	Total children.	With decayed teeth.		With adenoids.		With diseased tonsils.		With postural defects.		With bony defects of rachitic origin.		With anemia.	
		Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.
Total.....	3,125	2,021	64.7	1,050	33.6	406	13.0	885	28.3	467	14.9	243	7.8
4½ pounds or more below average.....	84	51	60.7	31	36.9	12	14.3	33	39.3	17	20.2	20	23.8
3½ and 4 pounds below average.....	99	68	68.7	35	35.4	19	19.2	30	30.3	23	23.2	15	15.2
3 pounds below average.....	110	69	62.7	37	33.6	20	18.2	41	37.3	19	17.3	17	15.5
2½ pounds below average.....	126	72	57.1	33	26.2	23	18.3	37	29.4	19	15.1	16	12.7
2 pounds below average.....	177	100	56.5	55	31.1	10	5.6	50	28.2	20	11.3	15	8.5
1½ pounds below average.....	188	126	67.0	56	29.8	22	11.7	59	31.4	32	17.0	21	11.2
1 pound below average.....	255	158	62.0	74	29.0	32	12.5	79	31.0	42	16.5	17	6.7
½ pound below average.....	241	154	63.9	85	35.3	39	16.2	73	30.3	43	17.8	16	6.6
Average.....	270	185	68.5	88	32.6	30	11.1	71	26.3	39	14.4	14	5.2
½ pound above average.....	234	144	61.5	84	35.9	22	9.4	62	26.5	26	11.1	13	5.6
1 pound above average.....	259	160	61.8	93	35.9	32	12.4	70	27.0	40	15.4	18	6.9
1½ pounds above average.....	217	135	62.2	70	32.3	25	11.5	51	23.5	36	16.6	13	6.0
2 pounds above average.....	185	114	61.6	59	31.9	19	10.3	46	24.9	28	15.1	10	5.4
2½ pounds above average.....	146	96	65.8	51	34.9	18	12.3	40	27.4	17	11.6	10	6.8
3 pounds above average.....	119	80	67.2	41	34.5	21	17.6	37	31.1	16	13.4	6	5.0
3½ and 4 pounds above average.....	159	114	71.7	53	33.3	23	14.5	39	24.5	21	13.2	4	2.5
4½ pounds or more above average.....	207	153	73.9	89	43.0	28	13.5	53	25.6	20	9.7	14	6.8
Not classified.....	49	42	85.7	16	32.7	11	22.4	14	28.6	9	18.4	4	8.2

<sup>1</sup> In this table, the average weights for height of the Children's Year series were taken as standard. See Statures and Weights of Children under Six Years of Age, Children's Bureau Publication No. 87, p. 29.

TABLE 12.—Annual earnings of chief breadwinner, by color and nativity of mother; children 2 to 7 years of age given physical examination.

Annual earnings of chief breadwinner.	Total children.		Color and nativity of mother.								Not reported. <sup>1</sup>
			White.						Negro.		
	Total.		Native.		Foreign born.						
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	
Total.....	3,125	100.0	3,047	100.0	1,151	100.0	1,896	100.0	71	100.0	7
Under \$650.....	110	3.5	102	3.3	19	1.7	83	4.4	8	11.3	.....
\$650-\$849.....	240	7.7	229	7.5	34	3.0	195	10.3	11	15.5	.....
\$850-\$1,049.....	412	13.2	396	13.0	69	6.0	327	17.2	15	21.1	1
\$1,050-\$1,249.....	491	15.7	477	15.7	146	12.7	331	17.5	14	19.7	.....
\$1,250-\$1,449.....	456	14.6	448	14.7	154	13.4	294	15.5	8	11.3	.....
\$1,450-\$1,849.....	613	19.6	606	19.9	313	27.2	293	15.5	6	8.5	1
\$1,850-\$2,249.....	262	8.4	259	8.5	151	13.1	108	5.7	1	1.4	2
\$2,250 and over.....	303	9.7	300	9.8	194	16.9	106	5.6	1	1.4	2
No chief breadwinner and no earnings.....	58	1.9	57	1.9	19	1.7	38	2.0	1	1.4	.....
Not reported.....	180	5.8	173	5.7	52	4.5	121	6.4	6	8.5	1

<sup>1</sup> Per cent distribution not shown where base is less than 50.





## APPENDIX B. RESULTS OF PHYSICAL EXAMINATIONS OF CHILDREN UNDER TWO YEARS OF AGE.

### Source of material.

During the conferences held in connection with this study, examinations were made of 994 infants, the same standards being observed in making the physical examinations and tabulations as were used in the preschool group. Since rather interesting differences in the incidence of defects in the two age groups were found, a brief statement of the results is here appended.

### Findings in general.

Of the entire group of 994 infants, 28.3 per cent were found to have no defects; less than half (40.2 per cent) of those under 6 months of age were without defect. More boys than girls showed defects, as only 12 per cent of the former were without defect in contrast to 46.4 per cent of the latter.

TABLE I.—Number of defects, by age and sex; children under 2 years of age given physical examination.

Number of defects, and sex.	Total children.		Under 6 months.		6 months, under 1 year.		1 year, under 1½ years.		1½ years, under 2 years.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	994	100.0	214	100.0	278	100.0	245	100.0	257	100.0
With defects.....	713	71.7	128	59.8	182	65.5	191	78.0	212	82.5
Less than 5.....	676	68.0	128	59.8	179	64.4	180	73.5	189	73.5
1.....	318	32.0	87	40.7	104	37.4	69	28.2	58	22.6
2.....	205	20.6	31	14.5	52	18.7	61	24.9	61	23.7
3.....	114	11.5	6	2.8	18	6.5	39	15.9	51	19.8
4.....	39	3.9	4	1.9	5	1.8	11	4.5	19	7.4
5 to 9.....	34	3.4			3	1.1	11	4.5	20	7.8
10 to 14.....	3	.3							3	1.2
Without defects.....	281	28.3	86	40.2	96	34.5	54	22.0	45	17.5
Boys.....	524	100.0	113	100.0	146	100.0	128	100.0	137	100.0
With defects.....	461	88.0	96	85.0	127	87.0	115	89.9	123	89.8
Less than 5.....	435	83.0	96	85.0	125	85.6	106	82.8	108	78.8
1.....	188	35.9	61	54.0	65	44.5	35	27.3	27	19.7
2.....	137	26.1	26	23.0	41	28.1	36	28.1	34	24.8
3.....	81	15.5	6	5.3	14	9.6	28	21.9	33	24.1
4.....	29	5.5	3	2.7	5	3.4	7	5.5	14	10.2
5 to 9.....	24	4.6			2	1.4	9	7.0	13	9.5
10 to 14.....	2	.4							2	1.5
Without defects.....	63	12.0	17	15.0	19	13.0	13	10.2	14	10.2
Girls.....	470	100.0	101	100.0	132	100.0	117	100.0	120	100.0
With defects.....	252	53.6	32	31.7	55	41.7	76	65.0	89	74.2
Less than 5.....	241	51.3	32	31.7	54	40.9	74	63.2	81	67.5
1.....	130	27.7	26	25.7	39	29.5	34	29.1	31	25.8
2.....	68	14.5	5	5.0	11	8.3	25	21.4	27	22.5
3.....	33	7.0			4	3.0	11	9.4	18	15.0
4.....	10	2.1	1	1.0			4	3.4	5	4.2
5 to 9.....	10	2.1			1	.8	2	1.7	7	5.8
10.....	1	.2							1	.8
Without defects.....	218	46.4	69	68.3	77	58.3	41	35.0	31	25.8

An analysis of the kinds of defects as given in Table II shows a fairly even distribution as to sex except in defects of the genitalia, where a marked difference between boys and girls occurs.

TABLE II.—Prevalence of disease or defects, by sex; children under 2 years of age given physical examination.

Disease or defect.	Both sexes.		Boys.		Girls.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Total.....	994	100.0	524	100.0	470	100.0
Without defect.....	281	28.3	63	12.0	218	46.4
With disease or defect.....	713	71.7	461	88.0	252	53.6
General:						
Underweight (10 per cent and over).....	262	26.4	152	29.0	110	23.4
Anemia.....	22	2.2	13	2.5	9	1.9
Head.....	172	17.3	89	17.0	83	17.7
Abnormal shape.....	25	2.5	16	3.1	9	1.9
Open fontanel (children 1½ to 2 years of age).....	49	4.9	25	4.8	24	5.1
Eyes:						
Diseases and defects other than of vision.....	23	2.3	14	2.7	9	1.9
Conjunctivitis.....	3	.3	3	.6	.....	.....
Blepharitis.....	2	.2	1	.2	1	.2
Stye.....	1	.1	.....	.....	1	.2
Ptosis.....	2	.2	2	.4	.....	.....
Corneal opacities.....	2	.2	.....	.....	2	.4
Strabismus.....	13	1.3	8	1.5	5	1.1
Blindness (one eye).....	1	.1	.....	.....	1	.2
Ears.....	8	.8	5	1.0	3	.6
Acute otorrhea.....	2	.2	.....	.....	2	.4
Chronic otorrhea.....	6	.6	5	1.0	1	.2
Mouth.....	26	2.6	15	2.9	11	2.3
Decayed teeth.....	16	1.6	10	1.9	6	1.3
Malocclusion.....	12	1.2	5	1.0	7	1.5
Naso-pharynx.....	225	22.6	129	24.6	96	20.4
Defective tonsils.....	182	18.3	101	19.3	81	17.2
Adenoids (definite).....	22	2.2	17	3.2	5	1.1
Adenoids (suspected).....	31	3.1	17	3.2	14	3.0
Glands:						
Enlarged or greatly enlarged.....	38	3.8	23	4.4	15	3.2
Submaxillary.....	16	1.6	9	1.7	7	1.5
Cervical.....	22	2.2	14	2.7	8	1.7
Axillary.....	1	.1	1	.2	.....	.....
Inguinal.....	5	.5	2	.4	3	.6
Heart.....	3	.3	2	.4	1	.2
Heart disease.....	1	.1	1	.2	.....	.....
Questionable heart disease.....	2	.2	1	.2	1	.2
Lungs.....	9	.9	7	1.3	2	.4
Lung disease.....	4	.4	4	.8	.....	.....
Questionable lung disease.....	5	.5	3	.6	2	.4
Skin.....	26	2.6	14	2.7	12	2.6
Eczema.....	14	1.4	7	1.3	7	1.5
Impetigo.....	2	.2	2	.4	.....	.....
Infected sores.....	10	1.0	5	1.0	5	1.1
Ringworm.....	1	.1	1	.2	.....	.....
Scars.....	2	.2	1	.2	1	.2
Abdomen.....	150	15.1	71	13.5	79	16.8
Distended abdomen.....	121	12.2	56	10.7	65	13.8
Enlarged liver.....	1	.1	1	.2	.....	.....
Hernia.....	38	3.8	19	3.6	19	4.0
Bony and muscular system.....	135	13.6	81	15.5	54	11.5
Beaded ribs.....	11	1.1	7	1.3	4	.9
Pigeon breast.....	2	.2	2	.4	.....	.....
Harrison's groove.....	10	1.0	8	1.5	2	.4
Enlarged epiphyses.....	8	.8	5	1.0	3	.6
Round shoulders.....	3	.3	2	.4	1	.2
Winged scapulae.....	1	.1	1	.2	.....	.....
Lordosis.....	4	.4	3	.6	1	.2
Knock-knee.....	1	.1	1	.2	.....	.....
Bowlegs.....	121	12.2	72	13.7	49	10.4
Clubfeet.....	2	.2	1	.2	1	.2
Arthritis.....	2	.2	2	.4	.....	.....
Paralysis.....	1	.1	1	.2	.....	.....
Mentality.....	7	.7	4	.8	3	.6
Defect apparent.....	2	.2	2	.4	.....	.....
Defect suspected.....	5	.5	.....	.....	5	.6
Genitalia: Boys.....	.....	.....	374	71.4	.....	.....
Prepuce defects.....	.....	.....	371	70.8	.....	.....
Defects other than those of prepuce.....	.....	.....	7	1.3	.....	.....
Genitalia: Girls.....	.....	.....	.....	.....	2	.4
Vaginal discharge.....	.....	.....	.....	.....	.....	.....

Irrespective of age, the average number of defects of all infants examined was 2.2 for boys and 1.9 for girls.

The incidence of defects according to age increased steadily in both sexes from 6 months to 2 years, but the rate of increase was much higher in girls. For instance, 85 per cent of the boys under 6 months of age had defects, in contrast to 31.7 per cent of the girls; while at 2 years of age the defects had increased to 89.8 per cent and 74.2 per cent for boys and girls respectively.

### Height and weight.

The average heights and weights of all white infants are recorded by months in Text Table IV. As in the case of the preschool child, these averages are somewhat lower throughout than those used as standards in the examinations.

### Nutrition.

More than a quarter (26.4 per cent) of all children under 2 years of age were more than 10 per cent below average weight for height, in contrast with 9.7 per cent of the children 2 to 7 years of age. This marked difference, in the two homogeneous groups classified by age, rather suggests that a range greater than 10 per cent below average weight for height would be a fairer standard during infancy.

The age group, 6 months to 1 year, showed the highest per cent (14) graded "excellent" as to nutrition, and the higher age group, 1 to 1½ years, had the highest per cent (35.9) underweight. In fact, the proportion of children 10 per cent or more below the average weight for height increased steadily with age up to 18 months; but in the 6 month period following, a decidedly better condition was apparent, only 21 per cent of these children being 10 per cent or more underweight.

TABLE III.—Grade of nutrition, by age and sex; children under 2 years of age given physical examination.

Age and sex.	Total children.	Grade of nutrition.							
		Excellent		Good.		Poor.		Very poor.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Both sexes.....	994	94	9.5	638	64.2	242	24.3	20	2.0
Under 6 months.....	214	10	4.7	159	74.3	38	17.8	7	3.3
6 months, under 1 year.....	278	39	14.0	164	59.0	72	25.9	3	1.1
1 year, under 1½ years.....	245	20	8.2	137	55.9	85	34.7	3	1.2
1½ years, under 2 years.....	257	25	9.7	178	69.3	47	18.3	7	2.7
Boys.....	524	61	11.6	311	59.4	141	26.9	11	2.1
Under 6 months.....	113	6	5.3	79	69.9	24	21.2	4	3.5
6 months, under 1 year.....	146	28	19.2	75	51.4	41	28.1	2	1.4
1 year, under 1½ years.....	128	12	9.4	65	50.8	50	39.1	1	.8
1½ years, under 2 years.....	137	15	10.9	92	67.2	26	19.0	4	2.9
Girls.....	470	33	7.0	327	69.6	101	21.5	9	1.9
Under 6 months.....	101	4	4.0	80	79.2	14	13.9	3	3.0
6 months, under 1 year.....	132	11	8.3	89	67.4	31	23.5	1	.8
1 year, under 1½ years.....	117	8	6.8	72	61.5	35	29.9	2	1.7
1½ years, under 2 years.....	120	10	8.3	86	71.7	21	17.5	3	2.5

A table showing the amount of deviation from average weight for height in children under 2 years of age is given for purposes of comparison with the preschool group.

TABLE IV.—*Deviation from average weight for height, by age and sex; children under 2 years of age given physical examination.*

Deviation from average weight for height.	Total children.		Under 6 months.		6 months, less than 1 year.		1 year, less than 1½ years.		1½ years, less than 2 years.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	994	100.0	214	100.0	278	100.0	245	100.0	257	100.0
Average and above.....	307	30.9	96	44.9	86	30.9	57	23.3	68	28.5
Below average.....	687	69.1	118	55.1	192	69.1	188	76.7	189	73.5
Less than 7 per cent.....	279	28.1	49	22.9	73	26.3	63	25.7	94	36.6
7 per cent, less than 10.....	146	14.7	24	11.2	44	15.8	37	15.1	41	16.0
10 per cent and over.....	262	26.4	45	21.0	75	27.0	88	35.9	54	21.0
Boys.....	524	100.0	113	100.0	146	100.0	128	100.0	137	100.0
Average and above.....	165	31.5	42	37.2	51	34.9	28	21.9	44	32.1
Below average.....	359	68.5	71	62.8	95	65.1	100	78.1	93	67.9
Less than 7 per cent.....	189	26.5	29	25.7	29	19.9	34	26.6	47	34.3
7 per cent, less than 10.....	68	13.0	14	12.4	23	15.8	15	11.7	16	11.7
10 per cent and over.....	152	29.0	28	24.8	43	29.5	51	39.8	30	21.9
Girls.....	470	100.0	101	100.0	132	100.0	117	100.0	120	100.0
Average and above.....	142	30.2	54	53.5	35	26.5	29	24.8	24	20.0
Below average.....	328	69.8	47	46.5	97	73.5	88	75.2	96	80.0
Less than 7 per cent.....	140	29.8	20	19.8	44	33.3	29	24.8	47	39.2
7 per cent, less than 10.....	78	16.6	10	9.9	21	15.9	22	18.8	25	20.8
10 per cent and over.....	110	23.4	17	16.8	32	24.2	37	31.6	24	20.0

### Anemia.

Of the children under 2 years of age, only 2.2 per cent showed sufficient pallor to be considered anemic. Pallor increased with age, as did the number of defects, and was more common in boys than in girls. The percentage was also higher in underweight children.

### Vaccination.

Only 24, or 2.4 per cent, of the children under 2 years of age had been vaccinated.

### Head.

Measurements showed only 13 heads of abnormal size, 7 small and 6 large, in the 994 children of this age group, a percentage of 1.3. Special attention was given to the palpation of fontanels. Four cases of completely closed fontanels were noted in infants under 6 months, and 15 in the period 6 months to 1 year. There were 49 cases of open fontanel in infants between 18 months and 2 years of age.

### Eyes.

Obviously, it was impossible to obtain data regarding vision in this group; but 23 infants, or 2.3 per cent, showed eye defects, the pro-

portion steadily increasing with age from 0.9 per cent among infants under 6 months to 3.1 per cent among those 1½ to 2 years of age.

### Ears.

Ear defects in this group of infants were confined to 8 cases of otorrhea.

### Mouth.

A careful examination of the mouths revealed little of significance beyond the fact that only 5 infants, or 2.3 per cent of those under 6 months of age, had one or more teeth, while 11.2 per cent had completed teething under 2 years of age. Sixteen infants (2.4 per cent) 18 months of age or over had decayed teeth, and 12 cases (1.2 per cent) of malocclusion were found.

### Nasopharynx.

The most common defects of infancy, as of the preschool age, were those of the nasopharynx, although these defects were about one-third as prevalent in infancy as in the preschool period. Boys slightly predominated in all types of nasopharyngeal defects, showing 24.6 per cent in contrast to 20.4 per cent among the girls. The incidence of nasopharyngeal defects among infants under 6 months of age was noticeably slight, but a marked and gradual increase in the number of defects with age was found.

TABLE V.—*Nasopharyngeal defects, by age and sex; children under 2 years of age given physical examination.*

Age and sex.	Total children.	With mouth breathing.		With high-arch palate.		With defective tonsils.		With adenoids.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Both sexes .....	994	55	5.5	30	3.0	182	18.3	53	5.3
Under 6 months .....	214			1	.5	10	4.7		
6 months, under 1 year .....	278	10	3.6	6	2.2	30	10.8	11	4.0
1 year, under 1½ years .....	245	19	7.8	11	4.5	60	24.5	17	6.9
1½ years, under 2 years .....	257	26	10.1	12	4.7	82	31.9	25	9.7
Boys .....	524	34	6.5	16	3.1	101	19.3	34	6.5
Under 6 months .....	113			1	.9	5	4.4		
6 months, under 1 year .....	146	7	4.8	4	2.7	16	11.0	8	5.5
1 year, under 1½ years .....	128	11	8.6	6	4.7	32	25.0	11	8.6
1½ years, under 2 years .....	137	16	11.7	5	3.6	48	35.0	15	10.9
Girls .....	470	21	4.5	14	3.0	81	17.2	19	4.0
Under 6 months .....	101					5	5.0		
6 months, under 1 year .....	132	3	2.3	2	1.5	14	10.6	3	2.3
1 year, under 1½ years .....	117	8	6.8	5	4.3	28	23.9	6	5.1
1½ years, under 2 years .....	120	10	8.3	7	5.8	34	28.3	10	8.3

Mouth breathing increased from 3.6 per cent in the 6 months to 1 year period to 10.1 per cent in the 18 months to 2 years period.

High-arch palate showed a gradual development after 6 months of age, the majority of cases being pronounced enough for recording only after 1 year of age.

*Tonsils.*—Enlargement of tonsils increased with age from 4.7 per cent under 6 months to 31.9 per cent from 18 months to 2 years. To what extent the so-recorded "enlarged tonsils" may have been a normal hyperplasia of lymphoid tissue needs to be verified by further observations; but only 1 infant in the group was considered to have greatly enlarged tonsils and only 1 had diseased tonsils.

Removal of tonsils was advised in only 4 cases of the 182 defective, 3 of these being accompanied by adenoids.

*Adenoids.*—The prevalence of adenoids increased with age, even during the period of infancy. Adenoids were definitely diagnosed in 22 cases (2.2 per cent), and symptoms such as mouth breathing and high-arch palate led to a diagnosis of "suspected or probable" adenoids in 31 cases (3.1 per cent); thus the number of infants having definite or probable adenoids amounted to 5.3 per cent.

Removal of adenoids was recommended in a total of 9 cases, 6 being combined with defective tonsils. Only 1 case of adenoids requiring removal was found in a child under 1 year of age.

### Glands.

In 66 per cent of the entire group of infants the glands were not even "palpable," and only 3.8 per cent had actually "enlarged" glands.

TABLE VI.—Condition of tonsils, by age; children under 2 years of age given physical examination.

Condition of tonsils.	Total children.		Under 6 months.		6 months, under 1 year.		1 year, under 1½ years.		1½ years, under 2 years.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Total.....	994	100.0	214	100.0	278	100.0	245	100.0	257	100.0
Normal.....	811	81.6	204	95.3	248	89.2	185	75.5	174	67.7
Removed, not defective.....	1	.1							1	.4
Defective.....	182	18.3	10	4.7	30	10.8	60	24.5	82	31.9
Enlarged only.....	180	18.1	10	4.7	29	10.4	60	24.5	81	31.5
Greatly enlarged only.....	1	.1							1	.4
Diseased and enlarged.....	1	.1			1	.4				

That the size of the glands gradually but markedly increased with age is shown by the percentage "palpable," as follows: 7.9 per cent under 6 months, 25.5 per cent from 6 months to a year, 38.4 per cent from 1 year to 18 months, and 45.9 per cent from 18 months to 2 years.

TABLE VII.—Condition of glands, by age and sex; children under 2 years of age given physical examination.

Condition of glands, and sex.	Total children.		Under 6 months.		6 months, under 1 year.		1 year, under 1½ years.		1½ years, under 2 years.	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Both sexes.....	994	100.0	214	100.0	278	100.0	245	100.0	257	100.0
Glands:										
Normal.....	656	66.0	195	91.1	206	74.1	141	57.6	114	44.4
Palpable.....	300	30.2	17	7.9	71	25.5	94	38.4	118	45.9
Enlarged and greatly enlarged.	38	3.8	2	.9	1	.4	10	4.1	25	9.7
With associated infection.....	21	2.1	1	.5	.....	.....	2	.8	18	7.0
Without associated infection.....	17	1.7	1	.5	1	.4	8	3.3	7	2.7
Boys.....	524	100.0	113	100.0	146	100.0	128	100.0	137	100.0
Glands:										
Normal.....	325	62.0	101	89.4	104	71.2	67	52.3	53	38.7
Palpable.....	176	33.6	11	9.7	41	28.1	55	43.0	69	50.4
Enlarged and greatly enlarged.	23	4.4	1	.9	1	.7	6	4.7	15	10.9
With associated infection.....	12	2.3	.....	.....	.....	.....	1	.8	11	8.0
Without associated infection.....	11	2.1	1	.9	1	.7	5	3.9	4	2.9
Girls.....	470	100.0	101	100.0	132	100.0	117	100.0	120	100.0
Glands:										
Normal.....	331	70.4	94	93.1	102	77.3	74	63.2	61	50.8
Palpable.....	124	26.4	6	5.9	30	22.7	39	33.3	49	40.8
Enlarged and greatly enlarged.	15	3.2	1	1.0	.....	.....	4	3.4	10	8.3
With associated infection.....	9	1.9	1	1.0	.....	.....	1	.9	7	5.8
Without associated infection.....	6	1.3	.....	.....	.....	.....	3	2.6	3	2.5

**Heart.**

Only one case of positive organic cardiac disease and two questionable cases were found in the total of 994 infants.

**Lungs.**

The slight incidence of respiratory disease in this group of infants is interesting, as shown by only four positive diagnoses and five questionable cases.

**Skin.**

A comparatively small percentage of infants showed any abnormal skin condition—only 26, or 2.6 per cent.

**Abdomen.**

Distended abdomen was found in 121 cases, or 12.2 per cent, this condition being slightly more prevalent among girls.

The presence of hernia was noted in 3.8 per cent of the group. In both sex groups umbilical herniæ predominated. Inguinal hernia was observed in 7 cases, of which 6 were boys. The largest number of herniæ by age was found in the 18 months to 2 years groups.

Enlarged liver occurred in the case of one boy.

**Bony and muscular system.**

Positive signs<sup>1</sup> upon which definite diagnoses of rickets were based were found in 22 cases (2.2 per cent). Fifty-three additional cases having one or more suggestive signs were recorded "probably rachitic."<sup>2</sup> No cases were noted in the group under 6 months of age; 7 of the children classified as rachitic were between 6 months and 1 year, 9 were between 1 year and 1½ years, and 59 (78.7 per cent of all those with rickets) were over 18 months.

Of the rachitic children 12.1 per cent had defective tonsils, as compared with 6.6 per cent of those showing no evidence of rickets.

TABLE VIII.—*Rickets, by age and sex; children under 2 years of age given physical examination.*

Age and sex.	Total children.	With rickets.		With probable rickets.		Without rickets.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Both sexes.....	994	22	2.2	53	5.3	919	92.5
Under 6 months.....	214					214	100.0
6 months, under 1 year.....	278	4	1.4	3	1.1	271	97.5
1 year, under 1½ years.....	245	6	2.4	3	1.2	236	96.3
1½ years, under 2 years.....	257	12	4.7	47	18.3	198	77.0
Boys.....	524	14	2.7	27	5.2	483	92.2
Under 6 months.....	113					113	100.0
6 months, under 1 year.....	146	3	2.1	2	1.4	141	96.6
1 year, under 1½ years.....	128	4	3.1	1	.8	123	96.1
1½ years, under 2 years.....	137	7	5.1	24	17.5	106	77.4
Girls.....	470	8	1.7	26	5.5	436	92.8
Under 6 months.....	101					101	100.0
6 months, under 1 year.....	132	1	.8	1	.8	130	98.5
1 year, under 1½ years.....	117	2	1.7	2	1.7	113	96.6
1½ years, under 2 years.....	120	5	4.2	23	19.2	92	76.7

TABLE IX.—*Rickets, by condition of tonsils; children under 2 years of age given physical examination.*

Condition of tonsils.	Total children.	With rickets.		With probable rickets.		Without rickets.	
		Number.	Per cent. <sup>1</sup>	Number.	Per cent. <sup>1</sup>	Number.	Per cent. <sup>1</sup>
Total.....	994	22	2.2	53	5.3	919	92.5
Normal.....	811	16	2.0	37	4.6	758	93.5
Removed, not defective.....	1					1	
Defective.....	182	6	3.3	16	8.8	160	87.9
Enlarged only.....	180	6	3.3	16	8.9	158	87.8
Greatly enlarged only.....	1					1	
Diseased and enlarged.....	1					1	

<sup>1</sup> Not shown where base is less than 50.

Of the rachitic children 10.7 per cent showed "enlarged" glands, 38.7 per cent "palpable" glands, 50.7 per cent nonpalpable glands, as compared with 3.3 per cent, 29.5 per cent, and 67.2 per cent, respectively, of the nonrachitic children.

<sup>1</sup> For signs, see page 58.

<sup>2</sup> See page 58.



TABLE X.—Condition of glands, by presence of rickets; children under 2 years of age given physical examination.

Condition of glands.	Total children.		With rickets or probable rickets.		With rickets.	With probable rickets.	Without rickets.	
	Number.	Per cent distribution.	Number.	Per cent distribution.			Number.	Per cent distribution.
Total.....	994	100.0	75	100.0	22	53	919	100.0
Normal.....	656	66.0	38	50.7	8	30	618	67.2
Palpable.....	300	30.2	29	38.7	9	20	271	29.5
Enlarged and greatly enlarged.....	38	3.8	8.	10.7	5	3	30	3.3
With associated infection.....	21	2.1	2	2.7	.....	.....	19	2.1
Without associated infection.....	17	1.7	6	8.0	3	3	11	1.2

Bowlegs were more common among the boys than among the girls, 13.7 of the boys and 10.4 per cent of the girls being thus deformed. All other rachitic signs were also more noticeable in the boys than in the girls.

#### Arch measurements.

Arch measurements were taken on 552 infants and the median height was found to be the same,  $\frac{1}{2}$  inch, up to 18 months, but increased to  $\frac{3}{4}$  inch in infants from 18 months to 2 years.

#### Mental condition.

Two cases of apparent and five cases of suspected mental defectives were noted during the course of the study.

#### Genitalia.

A very large per cent of defects of genitalia, chiefly contracted or adherent prepuce, was found among boys—71.4.

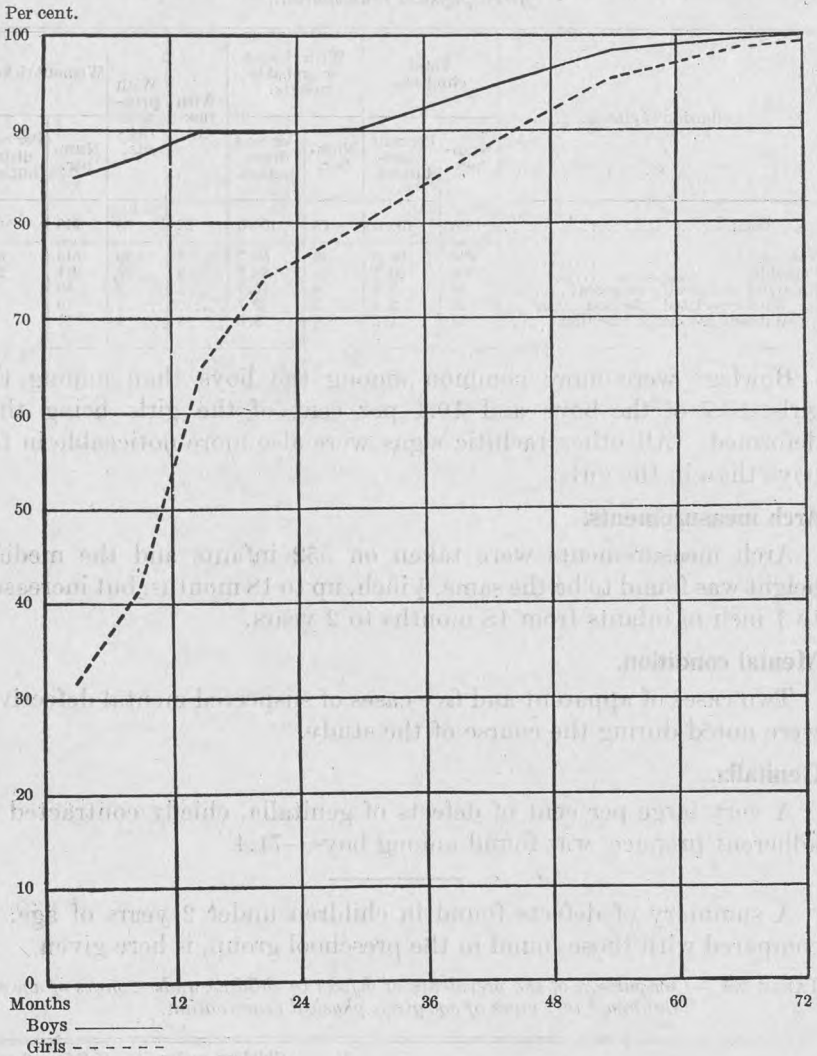
A summary of defects found in children under 2 years of age, as compared with those found in the preschool group, is here given.

TABLE XI.—Comparison of the prevalence of defects in children under 2 years of age and children 2 to 7 years of age given physical examination.

Summary of defects. <sup>1</sup>	Children under 2 years of age.		Children 2 to 7 years of age.	
	Number.	Per cent.	Number.	Per cent.
Total.....	994	100.0	3,125	100.0
Underweight (10 per cent and over).....	262	26.4	303	9.7
Anemia.....	22	2.2	243	7.8
Head defects.....	172	17.3	163	5.2
Eye diseases and defects other than of vision.....	23	2.3	245	7.8
Ear defects other than of hearing.....	8	.8	25	.8
Mouth defects.....	26	2.6	2,091	66.9
Naso-pharyngeal defects.....	225	22.6	2,157	69.0
Enlarged glands.....	38	3.8	908	29.1
Heart defects.....	3	.3	99	3.2
Lung defects.....	9	.9	32	1.0
Abnormal skin condition.....	26	2.6	318	10.2
Abdominal defects.....	150	15.1	464	14.8
Bony and muscular defects.....	135	13.6	1,308	41.9

<sup>1</sup> For specific defects see Text Table II, p. 29, and Appendix Table II, p. 76.

CHART V. Per cent of children having one or more defects, from birth to 6 years of age.



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