## PART III.—THE POSTURE OF NEW ZEALAND SCHOOL-CHILDREN.

(Preliminary Report.)

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Physical education and the study of faulty posture generally have been brought into prominence recently by various investigations and reports. All School Medical Officers are familiar with the problem of postural defect and the importance thereof, and towards the end of the year 1928 a survey was made by Miss Blackburne, Physical Instructress, Education Department, and myself in an endeavour to get some kind of an estimate as to the frequency and severity of postural defects among school-children, the effect of progress through the primary school on such deformities, and to try to ascertain whether the general picture was quite as gloomy as some authorities would lead us to believe. The survey is still incomplete along certain lines, but a description of methods and findings as far as they go may be of interest for discussion.

The correct standing posture is described by an authority as follows (see U.S.A. Department of Labour, Children's Bureau, Publications 164 and 165): "The body is in good mechanical position when the weight of it rests evenly on the heads of the femurs. In this position the head is balanced above the shoulders, the chest is elevated, and the breastbone is the part of the body farthest forward; the lower abdomen is retracted and flat, and the back curves are within normal limits. In the standing position the hip-joints in lateral view are directly in line with the knees and ankle-joints. A perpendicular dropped from behind the ear would fall through shoulder and ankle joints."

It might be pointed out here that this is a description of the ideal posture of the mature adult, and not necessarily normal in an individual still in the developmental stages.

American authorities would divide the average normal child into three groups, according to body types—

(1) The stocky type—heavy, thick-set, short-necked, heavy-looking.
(2) The thin type—slender, elongated, flexible, long neck and trunk; the length in the lumbar region is specially noted.
(3) The intermediate type—a compromise between the two, with characteristics pertaining to either.

The majority of postural deformities in children of any type is considered by them to be due to faulty body-balance (the thin type is therefore more prone to postural defects, owing to length and instability). The primary defect is said to be an increase in the pelvic inclination, a tipping-forward of this bony girdle. This produces, in greater or less degree, a series of maladjustments—viz., lordosis in the lower lumbar region, a compensatory kyphosis in the dorsal region, prominence of the abdomen, with stretching of the abdominal wall and a general tendency to pelvic congestion and ptosis of the abdominal organs. This abnormal pelvic angle also causes the weight of the body to come on the hinder portion of the foot instead of on the ball, and is considered to be an important factor in producing genu valgum, hallux valgus, and flattening of the posterior arch—in fact, the picture appears to be more or less descriptive of the attitude assumed by a large number of school-children up to the age of 12–13 years. Since the crux of the matter is considered to be the increased inclination of the pelvis, an assessment of the fault at that point should be a gauge of the degree of deformity presenting or later to be produced. This is done by measuring the angle that a line drawn between the anterior and posterior superior iliac spines makes with the horizontal. In a normally inclined pelvis this angle is considered to be about 12°.

With these conceptions before us, an examination of about one thousand children was made by Miss Blackburne and myself. The schools were selected in order to be as comprehensive as possible. Clyde Quay School was taken as representative of the town, and as far as possible of a mixed social grade; Carterton District High School as a country-town school; as well a series of small one-teacher schools in different parts of the district—so that the children examined form more or less of a cross-section of the school community.

The following points were taken for observation: The degrees of each deformity were noted as 1, 2, 3, and 4—1 being normal; 2, slight deviation from normal; 3, marked deviation from normal; 4, very marked and fixed deformity.

1. Position of head (forward inclination).
2. Position of shoulders: (*a*) L.R.=left raised; (*b*) R.R.=right raised; (*c*) winged scapula.
3. Spine: 1, 2, 3, 4, according to degree of deformity. (*a*) Kyphosis=K.; (*b*) scoliosis=S.; (*c*) lordosis=L.
4. Chest: (*a*) Flat chest; (*b*) pigeon chest; (*c*) depressed ribs; (*d*) depressed sternum. Note deformity with degree 1, 2, 3, 4.
5. Abdomen: 1, 2, 3, 4. (Degree of faulty position 1=normal.)
6. Knees: (*a*) Genu valgum; (*b*) genu varum.
7. Feet: (*a*) Flat foot; (*b*) deflection of big toe from normal; (*c*) deflection of Tendo Achilles.

These were gauged by inspection by both of us, and our combined opinions recorded. Certain measurements were also taken—height, weight, respiratory index, and the pelvic angle.

Moreover, an attempt was made to class the whole general posture of the individual as A, B, C, and D. (A=correct posture; B=slight deviation from it; C=definite deviation; D=marked deviation, with predisposing cause.) For comparison the results were collected in five age groups—viz., 5–6 years in one group, 7–8, 9–10, 11–12, 13–14–15 years.