## DEVELOPMENT OF THE NERVOUS SYSTEM.

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complexity. The order of development of control is, evidently, body, shoulder, arm, forearm and hand. In hand control the index finger differentiates before that of the others. (2) Fine and complicated movements are made with difficulty. (3) Children in normal healthy growth show a lack of co-ordination and control paralleled only by ataxic, choreic, and paralytic patients.

A test having a similar significance was used by Dr. Gilbert in his study of New Haven children. The subjects were given 10 weights, varying from 82 grammes to 100 grammes by steps of 2 grammes each, but indistinguishable in size. They were given the smallest weight as a standard, and asked to sort out the others which seemed to be of the same weight. The number of pupils tested was 50 for each year of age and sex, from 6 to 17. Dr. Gilbert thus summarizes : "The results show a gradual increase in ability to discriminate from the ages 6 to 13. After 13 there is a gradual falling off of 6.8 grammes (in discriminative precision), and then another gain till 17. Boys and girls, considered together, gradually increase in ability, but when they are considered separately, marked differences of sex appeared."

In the study, previously quoted, bearing upon characteristics of children who made "rapid," "normal" or "slow" progress in school grades under a system of promotion giving freedom to individuality, it is shown that 54 per cent. of the rapid pupils, 39 per cent. of the normal pupils, and 22 per cent. of the slow pupils are strikingly careful and accurate in their writing and drawing exercises ; while on the other hand, 11 per cent. of the most rapid, 34 per cent. of the normal, and 59 per cent. of the slow pupils are strikingly careless and inaccurate. From the evidence of this study we must link accuracy on the whole with a maturer mental development as indicated by school progress.

We may sum up the matter of accuracy: (1) that as a primary condition which makes accuracy of hand and arm possible, the child must have a matured degree of control under direction of his higher level centers (*i. e.*, voluntary). The fact that this maturity is not reached, normally, until the ninth or tenth year, renders questionable the efforts of the school to compel accuracy such as is required by the kindergarten, and also by the primary school, in writing, weaving, etc. (2) That the ability to be accurate in hand and finger movements increases very materially during school ages; (3) that accuracy depends indirectly upon the development of the body as a whole, the steadiness of the trunk muscles being as essential as the accuracy of hand or finger movements themselves; (4) that for purposes of delicate peripheral movements,