

disposition to these diseases; these may never show themselves if the environment and habits are such as to inhibit, correct, or overrule these tendencies. The cells of these descendants are certainly more vulnerable than those of individuals descended from a healthy stock, and clinical experience emphasises the recurrence in successive generations of these diseases.

In congenital syphilis, which is due to a specific microbe, the infection is ante-natal, either directly through the father or indirectly through the placenta. The toxins produced by the action of the specific germ cause debility in the germ cells, and thus inferior, immature, and diseased offspring result. But congenital syphilis is more correctly described as a pre-natal infection than as an inherited disease.

It is, however, difficult to differentiate between the conditions which are due to the organisation of the fertilized ovum, which may be characterised as innate, and those which are brought about by its ante-natal environment—*i.e.*, acquired.

It is certain that children born of unhealthy or alcoholic parents are seriously handicapped, however ideal their post-natal environment may be, but that they are doomed to the diseases of their forefathers is, happily, not demonstrable; if well nurtured, the unpromising bud may blossom into a fair flower.

Another of the problems which confront the biologist is that of the factors which determine sex. He appeals to the student of Heredity to throw light upon the subject if he can, but as yet it remains unsolved. Theories and hypotheses abound—the influence of food, the age and vigour of the parents, the age of the ovum, heredity, are some of the causes suggested by investigators, but they are all inconclusive. As yet one can only say “the development of one or other sex is determined by some unknown internal relation.” The fact that uniovular twins are always of the identical sex, while binovular twins may be of different sexes or of one sex, makes it conclusive that the sex is determined in the fertilised ovum. In the higher animals at least it seems that the environment of the embryo has no influence in the determination of sex.

Statistics show that the first-born child is more likely to be a male than a female (the proportion being about 8 to 7), and that there is also probably a greater likelihood of the second child being a male than a female. In the European and Semitic races there is a preponderance of male births, the ratio being 1,060 males to 1,000 females. In England for the last 200 years there have been more male births than female; thus the tendency to pro-

duce more males than females may be characterised as “hereditary.”

Another very interesting point is the striking resemblance and average level of successive generations. Statistics of height, weight, colour, etc., show that there is a type—a mean for each race, and that, in spite of striking exceptions, there is a general tendency to mediocrity.

Take, for example, the average length and weight of infants at birth; there is a continual tendency to maintain the specific average. In considering large numbers of the children of degenerate, impoverished, undersized parents, they do not differ in average length and weight, as one might rationally think they might from infants born to parents of good stock, well nourished and developed. There is ever the same tendency to sustain the same average level, physically and mentally, from generation to generation. This is known as the Law of Filial Regression.

Galton, Karl Pearson and others have investigated data as to stature in successive generations; they explain the tendency to revert to type by the fact that the child inherits not only from his parents, but from his ancestors, and the mean of that ancestry is probably not far from the mean of the general population. Thus Pearson writes in his “Grammar of Science”: “In the tenth generation a man has (theoretically) 1,024 tenth-great-grandparents. He is eventually the product of a population of this size, and their mean can hardly differ from that of the general population. It is the heavy weight of this mediocre ancestry which causes the son of an exceptional father to regress towards the general population mean; it is the balance of this sturdy commonplace which enables the son of a degenerate father to escape the whole burden of the parental ill.”

Eugenists are right when they urge careful mating of the physically fit as a moral duty. In the course of generations exceptional types would be produced; but there is hope for the offspring of so-called degenerate parents, for only rarely is the stock wholly bad; it is more often made up of varied elements, and traits and characteristics of worthy forbears may dominate in them. That gifted children may be born to parents whose intelligence is below the average, and that very ordinary children may be born to gifted parents is too common a phenomenon to call for remark. It is fairly safe to predict mediocrity for the majority of humans, owing to the mosaic inheritance of many generations. Yule states the Law of Ancestral Heredity as “a law by which the

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