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REMEDIAL CONDITIONS IN THE FEEBLE-MINDED AND BACKWARD

By

WALTER STEWART CORNELL, B.S., M.D.,

Philadelphia, Director of Medical Inspection in the Public Schools.

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REMEDIAL CONDITIONS IN THE FEEBLE-MINDED AND BACKWARD.¹

By WALTER STEWART CORNELL, M.D., Philadelphia, Director of Medical Inspection in the Public Schools.

This subject derives its practical importance from the recent increase in our knowledge concerning the hereditary transmission of feeble-mindedness, the association of feeble-mindedness in many cases with pauperism, vice, illegitimacy and crime and the present endeavor by those interested in social work to induce those in authority to provide more and better facilities, for the feeble-minded in institutions, and for the dull in special classes in the public school system.

The problem of remedial conditions in the case of *dull* children is theoretically simple, because here only the common and familiar defects of malnutrition, defective vision and defective hearing, and the social defect of poor home conditions need be considered. Marked improvement of the feeble-minded however is a difficult unsolved problem, and the hope of improvement of border-line cases (a numerous group) is almost as remote owing to the existence of feeble-mindedness in a large proportion of these cases and to uncertainty of diagnosis in all.

In this short paper, the feeble-minded and the dull will be discussed separately, its purpose being to emphasize the basic differences between the two groups with consequent basic differences in treatment and in expectation of improvement.

FIRST, CAN FEEBLE-MINDEDNESS BE CURED?

At the present time no means are known whereby a feeble-minded person may be made into a normal individual. The only exception is found in that special type of the feeble-minded, known as cretins, who are cured or marvelously improved by the administration of thyroid extract. The cretin type, however, constitutes but a fraction of one per cent. of all the feeble-minded.

The hope of complete cure is based on several theories which are at least worth considering. The slender chance afforded by

¹ Read at the Conference on the Conservation of School Children, Lehigh University, April 3, 1911.

them, however, certainly does not extend to those feeble-minded persons (about one-fifth of the whole number) who are the result of brain injury or brain disease affecting normal individuals in early life. Also hope of cure in all the feeble-minded, no matter what medical discoveries may be made, must diminish with increase of age, since there is a physiological law that any part of the body retarded too long in its development is incapable of full normal growth.

For the sake of clearness, it may be well to set down categorically the different theories of the cause of feeble-mindedness and then consider these causes and the appropriate remedies serially.

1. *Exhaustion of nervous vitality.*
2. *Exhaustion of general vitality.*
3. *Abnormality in the cellular elements throughout the body, arising from some abnormality in one or both parental germ cells.*
4. *Under-function of one or more of the glands of internal secretion.*
5. *Origin through miscellaneous causes, such as organic brain injury, cortical sclerosis, hydrocephalus, intoxication by syphilis and alcohol, lack of thyroid and possibly other internal secretions, general degeneracy, etc.*

First may be considered the plan of improving the general tone of the nervous system with a consequent improvement in all its functions. So far as the feeble-minded individual is himself concerned, this course of treatment is the one now pursued in our special training schools, where general hygiene and where special mental education based on systematically exercising special sense functions, perception, memory, association and reasoning, are employed. Experience has shown that the feeble-minded individual himself is never cured of feeble-mindedness by the most vigorous training and what hope exists is for his offspring possibly several generations remote. Our heredity records have shown the transmission of feeble-minded stock, but *not* the generation of feeble-minded stock with the *subsequent transmission* of feeble-minded stock. Neither do

any of the animal breeding experiments so far conducted show such improvement as to furnish an analogy to the reverse process of gradual raising of feeble-minded humans to the level of normal humans. Another objection to this theory is found in the possession of numerous and general original physical defects in the feeble-minded, pointing to a *general* inferior structure rather than inferiority in the nervous system alone. A final objection, or rather discouraging feature is that insanity, often cured by a hygienic régime, is now known to have but little relation to feeble-mindedness and feeble-mindedness is by far the more transmissible and non-improvable of the two.

Cases of feeble-mindedness apparently produced by parental alcoholism or by congenital or inherited syphilis may be brought forward for discussion as results of diseases which particularly select the nervous system for destruction, but our knowledge of the proportion of the feeble-minded arising from these diseases is at present so uncertain, and the number of the cases is so uncertain and so relatively small, that they are better considered as a separate group.

The second theory of a possible cure of feeble-mindedness is based on improvement of general vitality. We know that the feeble-minded display not only low mentality, poor co-ordination, low nerve-muscular tone, but also inferior musculature and a poor resistance to infectious diseases. Their expectation of life is short because tuberculosis and pneumonia attack them readily. Some reach the age of twenty or thirty years and then appear to deteriorate simply from premature decay. The tentatively accepted theory of the (special) Mongol type of the feeble-minded is that of exhaustion of the germ cells of one or both parents, with the production of weakling unfinished offspring. Corroborative of this theory is the proven great number and variety of physical defects in the feeble-minded, the argument being that the cells of the embryo have not possessed the requisite vigor of division and arrangement. For instance, over forty per cent. possess eyes which would require glasses if their possessors use their eyes for reading. Sixteen per cent. show original myopia. Valvular disease exists in twelve per cent. of all cases (it is ac-

known that some of these are not congenital). Malformations of the sexual organs, skin appendages and viscera are quite common. The average height of feeble-minded males of twenty-five years is $62\frac{1}{2}$ inches as compared to $66\frac{1}{2}$ inches height seen in the normal. Can anything be done for this general condition of degeneracy and low vitality, conceding this to be the correct explanation of the condition? The answer must be found in animal breeding experiments, and those so far carried out by the American Breeders' Association and by the Carnegie Institute have not as yet reached the goal of raising normal from degenerate stock.

Can feeble-mindedness be cured if due to a perversion or absence of the molecular elements in a germ cell and subsequently in the body cells developed from the germ cells? In other words, if the cytoplasm is leaky or one of the chromosomes is too short or whatnot, in every embryonic cell, and this in some way incidentally produces feeble-mindedness, can anything be done?

It should be noted that this conception of feeble-mindedness is entirely different from that in the two ideas previously considered. In them the feeble-minded represent simply the lowest stratum of mentality in the human race, and all humans may be arranged in a series with insensible gradations beginning with the most intellectual person and ending with the lowest grade idiot. According to this conception, the differences are simply quantitative. In the theory now considered feeble-mindedness may be looked upon as a sport on the normal human stock (using a botanical term), and therefore constituting a distinct anthropoid species with the power of transmitting itself and (assuming two feeble-minded parents) without the power of again producing normal persons. The difference according to this theory is not quantitative, but qualitative. Regeneration of normal stock is hopeless if both parents are feeble-minded, and hopeless in a predestined number of cases if one parent is feeble-minded.

The records of animal breeding experiments, and most family records of the feeble-minded, do not show with certainty that the feeble-minded are a group with definite structural peculiarities transmissible over and over again. Two small groups of types

of the feeble-minded, the microcephalic and the amaurotic idiots may be exceptions and exemplify the theory, and among the general mass of feeble-minded an occasional remarkable family tree is seen which apparently follows some definite natural law of reproduction. There is a heredity chart at the Training School for Feeble-Minded Children at Vineland, which shows the reproduction of feeble-minded persons regularly and constantly through several generations after a young man of normal family had had vicious relations with a feeble-minded woman. The identity of this man, now dead, is known; and his descendants by his legitimate wife are among the soundest and best citizens of New Jersey. Certainly if proof of this indefinite transmission of feeble-mindedness is once obtained, the necessity for segregation or sterilization of the feeble-minded can be no longer ignored. It must be acknowledged, however, that so far our proofs are too faulty to provide conclusions except by inductive reasoning.

Most of the clear cut heredity experiments are carried out in plants, rather than animals, and the special characteristics, known to be produced in humans (albinism, hemophilia) do not have any close relation to feeble-mindedness, nor are they found in feeble-minded persons more than they are in normal persons.

Taken together, it would appear more correct to account for the tendency of feeble-mindedness to transmit itself by the well known tendency of any poor nervous system (whether the case be one of neurasthenia, hysteria, insanity, feeble-mindedness, Friedreich's ataxia, or a muscular dystrophy) to transmit itself, rather than by some more specialized explanation.

The most hopeful, *a priori*, of the theories of the causations of feeble-mindedness is that one which accounts for the condition by a deficiency of certain body secretions whose function is to activate the brain and nervous system generally. The glands performing this work are certainly the thyroid and the anterior portion of the pituitary. The thymus gland apparently acts at times as an accessory thyroid and probably has other functions as yet unknown. The posterior lobe of the pituitary, the suprarenals, the sexual glands, pineal gland and certain glands in the head of the pancreas may contribute elements affecting

body growth and mental development. Knowing as we do that cretinism (one of the two sharp types of feeble-mindedness) is due to deficient thyroid secretion, it is plausible that mongolianism (the other one) is due to lack of some other secretion, say the pituitary. Possibly the general mass of the feeble-minded showing no particular type of characteristics, are due to a general shortage in the secretions of these glands. Recently Dupuy, a French investigator, has published a paper (*Bulletin médical*, Jan. 3, 1912) claiming remarkable results from mixtures of thyroid, pituitary, corpus luteum and orchitic extract, the proportions of these varying according to the case. Experiments conducted at the Training School at Vineland, New Jersey (by the writer on Mongols with a mixture of pituitary and thyroid extracts, and by Drs. Dana and Berkeley of New York with extract of pineal gland), have seemed to produce improvement in individual cases and in the case of the pineal feeding, a very slight but appreciable improvement in most of the cases treated. Knowledge of this phase of nutrition and mental development is unfortunately still in the experimental stage.

Finally must be considered the theory that feeble-mindedness is not the expression of one or two or three morbid conditions but rather of a considerable number, and that each must be considered separately so far as medical treatment is concerned. In favor of this view is the long list of causes, some hereditary and some originating in the individual, which reasonably account for the condition. Parental feeble-mindedness, parental alcoholism, parental old age with declining physical vigor, parental malnutrition from overwork or tuberculosis, injury to the head at the time of birth, infantile cerebral hemorrhage, meningitis, hydrocephalus, cortical sclerosis, congenital syphilis, deficiency in thyroid secretion, deficiency in pituitary secretion and deficiency in pineal secretion must all be remembered. It is true that a great proportion of the feeble-minded show feeble-mindedness in their ancestors, but the hereditary factor producing the feeble-mindedness may possibly be different in different cases, so that even here, we may not possess a large solid group of one particular sort. If any of the theories already mentioned should

succeed in giving us a cure for feeble-mindedness, it would therefore be only in one special group, and the other groups would still remain a problem. Rather a depressing prospect for the research worker, but one that might as well be recognized at the outset.

NEXT, MAY BE CONSIDERED SUCH IMPROVEMENT OF THE FEEBLE-MINDED AS IS NOW POSSIBLE WITH OUR PRESENT KNOWLEDGE AND METHODS.

One hundred years ago, Seguin changed the view point of the world toward the feeble-minded by treating them as children with weak minds, rather than as unfortunate objects fit only for a hospital or an asylum and not worth considering except as specimens of disease. In our own day, Barr of Elwyn profoundly stirred the social conscience regarding the feeble-minded by his book on mental defectives in which the human child was emphasized rather than his anatomic defects. Since then the education, or better, let us say training, of the feeble-minded, has become a recognized special work and this in turn has vivified the subject of psychology, and remarkably improved our methods of teaching all children. Today the mental improvement of the feeble-minded child is accomplished in the school-room, shop and garden, rather than in the hospital. With a system born of a psychological knowledge, the lowest grade cases are trained in the simpler mental processes of sense perception, perception of number and form, attention and memory, and the higher grade cases are trained to industrial work and to such reasoning power as can be produced. To give the feeble-minded brain its best opportunity, the eyesight, hearing and nutrition are given medical attention when necessary. Recently tests (by the late Prof. Binet) measuring the mental development of children from three to thirteen years have been devised and those for the ages of three to ten years inclusive are quite accurate. By these tests the interesting fact is shown that even with the best training methods, the rate of improvement is discouragingly low and the feeble-minded child drops steadily further and further behind. This fact brings home the great price in effort paid by our educational and institutional authorities in the training of defective children,

and the wear and tear on the individual teacher as well. It also emphasizes the danger of too much school training for a feeble-minded child lest his condition be masked and society made ultimately to suffer from his pauperism or delinquencies while at large in the community.

We should always bear in mind that physical defects found in the feeble-minded are not necessarily causative of mental inefficiency. Very often, these physical defects are simply associated conditions and the expression of a generally defective make-up. Some forty per cent. of the feeble-minded possess eyes of a character requiring glasses, if the mentality were sufficient to warrant the procuring of them. The open mouth seen in these children is not always due to originally existing adenoids; the jaw is dropped and the child has not sense enough to close it. Thereafter the adenoids may appear secondarily, because of the constant mouth breathing.

THIRD, A FEW WORDS ON THE REMEDIABLE CONDITIONS IN THE CHILD WHO IS NOT FEEBLE-MINDED, BUT SIMPLY DULL.

The treatment is exactly the same as that already outlined, namely, the clearing away of such obstacles as poor nutrition and defects in the special senses, individual attention in order that difficulties may be overcome, the training of the senses to better acuteness through the systematic exercises, the training of the motor side through physical and manual training, and the assistance of the sub-normal intellect by the use of measures involving association.

The Montessori system and other recent systems less talked about consist simply of these methods, although in the Montessori system a certain emphasis is laid on the education of the sense of touch. The truth about all these systems is that special measures are necessary in the case of deficient children and superfluous in the case of bright children. For instance, the dull child has to be shown how to add by means of balls strung on a wire, but the bright child discards this mechanical device after a few lessons and thinks quicker than it takes to count the objects. The same rule applies to our present method of teaching reading in which syllables rather than individual letters are taught.

Compared to the old method of teaching the letters first, it is better for bright children and worse for dull children.

Physical defects and environment have more relative influence in the case of dull children than they do in the case of feeble-minded children in whom the deficiency is often inherent and obtained in feeble-minded parents. A study by the writer of the influence of defective eyesight in school children showed that the children of normal vision obtained an average of seventy-five points, those of fair vision an average of seventy-three, and those with quite poor vision an average of sixty-nine. An analysis in the report of the London County Council for 1904 of the scholarship of 32,000 school boys and 29,000 school girls showed that the vision was progressive with the scholarship except in the case of the very brightest children whose eyesight was not quite as good on the average as the children classed as bright but not precociously bright. The relation of adenoids to dulness is so well established that it would be superfluous to detail the different investigations reported. As to defective hearing, it is well to note that most cases of defective hearing arise from adenoids and the two may therefore be considered in the same group, but a special study given in the report of the London County Council for 1907 showed that poor hearing existed in almost twice as many of the dull children as it did in the bright children.

Experience has shown that dull children under improved conditions of health, environment and school training may be greatly improved mentally.

A very interesting study made in one of the special classes of one of the Philadelphia Public Schools demonstrated that the average child before entering the class had accomplished about thirty-five per cent. of a grade per year, and after entering the class had succeeded in accomplishing eighty per cent. of the grade per year. This improvement does not necessarily imply that these children were made into normal children, for the work done in the special classes was that ordinarily done by younger children, but it certainly has a value from a comparative standpoint and points the way to the improvement of great numbers of children now failing to do the ordinary school work.