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THE RELATION OF ALCOHOL TO FEEBLE-MINDEDNESS.*

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I MUST first thank your Society for doing me the honour of asking me to open the discussion here on the connection between alcohol and feeble-mindedness. In one way such a theme is not altogether a congenial one to me, because my observations† have led me to conclude that the origin of congenital mental defect is nearly always complex, an opinion shared probably by the majority, and, at any rate, supported by such recognized authorities as Dr. Bevan Lewis‡ and Dr. Shuttleworth.§ Dominated as I am by this idea, it is a little difficult for me to pick out one factor and determine how far its influence extends. The sort of family history to be found among children in special schools for the mentally defective is the following: Father, phthisical and alcoholic; the father's brother died of phthisis and an uncle of alcoholism; the mother's mother died at thirty-four of phthisis, and her father of apoplexy at forty-eight. In another case the record is "a

* A paper introductory to a discussion held by the Society for the Study of Inebriety, Tuesday, October 13, 1908, in the rooms of the Medical Society of London, 11, Chandos Street, Cavendish Square, W.

† W. A. Potts, "Causation of Mental Defect in Children," *British Medical Journal*, October 14, 1905.

‡ "Royal Commission on the Care and Control of the Feeble-minded," vol. ii., p. 15, 1908.

§ G. E. Shuttleworth, "Mentally Deficient Children," p. 62. London, 1900.

history of insanity in the father's family ; the mother is alcoholic and phthisical." In such instances it would not be unreasonable to suggest that the alcoholism could not be blamed for the abnormality, while at the same time it would be open to an extremist to say that alcohol was the deciding factor. Corroboration of the theory that the cause of feeble-mindedness is a conglomeration of unfavourable elements was afforded by an investigation I conducted, and to which I shall refer more fully later on, into the family histories of a group of ordinary school-children. Here, as among the feeble-minded, were to be found records of frequent drunkenness, of phthisis, and even of insanity ; while, however, the incidence of such symptoms of degeneracy was less frequent than among the feeble-minded children, the most notable point of difference was that one bad record stood by itself in the family history : if the father was tubercular, or drank, then the mother and her escutcheon were without a blot.

As I have already hinted, there is an extreme school which asserts that alcohol has little or nothing to do with the feeble-minded ; another is equally insistent on the theme that it is the most important cause of all. We should expect the truth to lie somewhere in the middle zone. The question must not, however, be prejudged ; missing links in the chain of evidence must be forged only of reason and of common sense.

GENERAL ACTION OF ALCOHOL.

It will be convenient if we first consider whether any connection is possible, having regard to what we know of the action of alcohol, and also of the laws of heredity. It is a fact that alcohol is a protoplasmic poison ; it is absorbed and circulates in the blood, so that any portion of the body may be affected ; the generative organs and the germinal cells will not necessarily escape its influence. Indeed, as Dr. Claye Shaw* reminds us, alcoholic amenorrhœa and dysmenorrhœa point to the effect on the genital system of the mother. It must be remembered, too, that even if alcohol has no actual influence *per se*, it frequently, as Dr. Mott† and others have demonstrated, paves the way for the far-reaching effects of other injurious agencies, such as the absorption of toxins from the alimentary tract.

* Claye Shaw, "Interdepartmental Committee on Physical Deterioration," vol. iii., Appendix xvi., 1904.

† Mott, "Alcohol and Insanity," *Archives of Neurology*, vol. iii., 1907.

INFLUENCE OF HEREDITY.

And now, how do the laws of heredity bear on the case? Those who deny the importance of alcohol in this matter often rely largely on Weismann's dictum that acquired characteristics cannot be transmitted. Fortunately, I need not throw down the apple of discord by suggesting in any way that this is not absolutely true. Admit the doctrine to the full, and there is still, as Beard* has shown, ample scope for the production of injurious results in the offspring, if the parents are exposed to toxins of various kinds. The embryo is formed by the union of sperm and germ, the former derived from the father, the latter from the mother. Beard, in his treatise on the morphological continuity of germ-cells, has shown us that "the germ-cell must react to and be influenced by its environment. Given an environment of a certain kind, there will be no element of chance in its influence on the germ-cells. But, as the two packs of characters making up each germ-cell are not identical, this influence of the environment, including in this everything which can influence the individual and its germ-cells—food, climate, toxins, disease, natural phenomena of all sorts—will differently affect the various corresponding characters of any germ-cell." We may say briefly that Beard has demonstrated that at the reduction of the chromosomes, the reaction to the influences of the environment is a cause of variation and varieties; healthy influences promote variation of a good type, unfavourable ones tend towards a bad type. We may, if we like, call the latter "pathogenic variation," which the late Dr. Andriezen† said "is the peculiar inheritance of civilized man." It is not in the least necessary to traverse Weismann's teaching to establish this, for not even the most bigoted temperance reformer in our profession claims that alcoholism, as such, is inherited; while the most enthusiastic supporter of the doctrine that no characteristic can be developed in the offspring unless it existed before in the ancestral stock must admit that few families have such a perfect genealogical tree that they can boast there has been no blemish, such as dulness beyond the average, or a tendency to immoral or antisocial conduct, reversion to which might be disastrous. Before leaving this part of the subject, I must remind you of Galton's saying that the individual is "the trustee of the

* J. Beard, "A Morphological Continuity of Germ-cells as the Basis of Heredity and Variation," *Review of Neurology and Psychiatry*, vol. ii., 1904.

† W. Lloyd Andriezen, "The Problem of Heredity," *Journal of Mental Science*, vol. li., 1905.

germ-cells," and quote again from Beard: "For the well-being of future generations, for the good of the race, it can only be of the utmost moment that, as the germ-cells are the seed of the stock, contained in individuals, the total environment should be made, so far as it is possible, of the healthiest and best description for the latter."

In this connection the recent report of the Royal Commission on the Care and Control of the Feeble-minded furnishes serious matter for reflection, for it proves by means of personal investigations that congenital mental defectives occur in our population to nearly the extent of 1 in every 200.* This report should be studied in connection with the Reports of the Interdepartmental Committee on Physical Deterioration, and of the Royal Commission on Physical Training (Scotland); the latter contains comparisons between the children of Aberdeen and the larger town, Edinburgh, and shows how better health and development go hand in hand with better housing and more favourable surroundings generally, a fact also clearly established in some of the annual reports of Dr. Kerr, Medical Officer to the Education Committee of the London County Council. No doubt much of this degeneracy is due to bad environment after birth, but some of it may fairly be ascribed to ante-natal influence.

EFFECT OF ALCOHOL ON THE SPERM AND GERM CELLS.

Great, then, is the care needed for the sperm and germ cells, on both of which such factors as I have indicated may tell. As illustrating the action of alcoholism on the germ and sperm cells, Andriezen† collected many instances of the disastrous effects of bouts of drinking in the case of married couples who have permitted themselves immoderate alcoholic indulgence in the first few days of the honeymoon, but who have otherwise led lives of temperance; feeble and imbecile first-born children have often been the result. He quotes an interesting case of a man, aged twenty-two, the second child of a family of six. This individual was begotten by his father while in a state of "alcoholic intoxication and exaltation." The child was neurotic, and at twenty-two had

* "Report and Evidence of Royal Commission on the Care and Control of the Feeble-minded," vol. vi., p. 31, 1908.

† W. Lloyd Andriezen, "The Problem of Heredity, with special reference to the Pre-embryonic Life," *Journal of Mental Science*, January, 1905.

to be admitted to an asylum suffering from *dementia præcox*. "The father, a well-to-do man, had several mistresses, and was the father of several other children. Though given to occasional alcoholic indulgence, he abstained from cohabiting when in a state of intoxication, and his other children, born of his sober moments, were not afflicted mentally or bodily like the patient referred to."

Dr. Wigglesworth,* after studying 3,450 cases of insanity during a long series of years, stated that alcoholism is a fruitful cause of idiocy, mental defect, insanity, and other nervous diseases in the offspring. He considers there is "a direct poisoning of the germ-plasma itself by the alcohol circulating in the blood, and a consequent direct injury to the cells of which this structure is composed, and which by reason of the injury are prevented from developing into a stable organism. If the alcoholic poisoning of the germ-cells and ovum have reached a certain degree of intensity, imbecility, or even profound idiocy, may be expected to result; while if of a less degree the injury may manifest itself in the various forms of adolescent insanity, when adult life is developing, or has been attained."

EFFECT OF ALCOHOL ON THE EMBRYO.

But it is not only through the sperm and germ cells that unhygienic conditions may affect the offspring. After the embryo is formed by the union of sperm and germ, it is nourished for many months by the mother's blood, and is exposed to the action of any toxins in her system. We know that alcohol is carried to the placenta; indeed, Nicloux† detected alcohol in the liquor amnii five minutes after administering it through an oesophageal sound to pregnant guinea-pigs. We also know how susceptible young and growing tissues are to its toxic action. Actual demonstration, which was scarcely necessary, has been supplied by the experiments of Feré‡ upon its influence on hen's eggs hatched in incubators. Alcohol was applied as a vapour or by means of injection, and in every case control specimens were hatched in other incubators without being subjected to such toxic agency. "His results showed conclusively a large percentage of abnormali-

* *Journal of Mental Science*, October, 1902.

† Senator and Kaminer, "Health and Disease in Relation to Marriage and the Married State," translated by Dulberg, vol. ii., p. 1087. London, 1905.

‡ Horsley and Sturge, "Alcohol and the Human Body," p. 334. London, 1907.

ties in the chickens hatched under the influence of alcohol. This appeared in the form of deformities, monstrosities of body, and feebleness and lack of intelligence and of instinct (conditions comparable to the idiocies and imbecilities of mentally deficient children), while a large percentage of the chickens were found dead or still-born. Eggs hatched under normal conditions did not present anything approaching the above proportion of abnormality." Other experiments have been made with alcohol and the developing embryo, but I will not weary you with further reference to these, especially as there is a flaw here in the chain of evidence. An objector might reasonably argue that, although alcohol in sufficient strength will undoubtedly injure embryonic life, the strength required may exceed that in which it ever circulates in the blood of an individual. I am not aware of any scientific investigation in this direction, but it certainly is important to determine what percentage of alcohol can be demonstrated in the circulating blood. The late Dr. James Ridge* observed a deleterious effect of alcohol on *Daphniæ* in proportion to the amount down to one drop in a quart of water, and I expect a far greater amount than this could often be demonstrated in the blood.

In another direction, however, proof that is less controvertible is forthcoming. Cushny,† one of our leading authorities on pharmacology, states that "the deleterious effect of the alcoholic habit on the nutrition of the offspring is a well-established fact. It has been shown experimentally by Hodge, who states that only a small percentage of the puppies born of parents treated with alcohol survive, and further, that they are peculiarly liable to infectious disease, such as distemper." Again, Mariet and Combemale,‡ according to A. and F. Leppmann, made a bitch in the last weeks of her pregnancy drunk. She gave birth to seven puppies, of which four were dead, two healthy, "but possessed of very little intelligence, and the last was physically and mentally backward." The offspring of this latter animal were markedly degenerate. At this stage I may remind you of the following important sentence in the Report of the Interdepartmental Committee on Physical Deterioration: "It must be remembered that even Professor Cunningham, while denying the

* J. J. Ridge, "Report and Evidence of Interdepartmental Committee on Physical Deterioration," vol. iii., Appendix xvi., 1904.

† Cushny, "Text-book on Pharmacology," p. 152. London, 1903.

‡ Senator and Kaminer, "Health and Disease in Relation to Marriage and the Married State," translated by Dulberg, vol. ii., p. 1087. London, 1905.

influence of heredity in most cases, expressed the firm belief that diseases, such as syphilis and alcoholism, transmit their effects to the third and fourth generation—and in this opinion the Committee fully concur.”*

ELIMINATION BY ALCOHOL.

There is a group of scientific workers who admit that alcohol has the injurious effects on the offspring I have described, but at the same time do not attach such great importance to its evil consequences, because alcohol, in their opinion, is more an eliminator of the unfit than a producer of the unfit. Alcohol undoubtedly tends to the premature extinction of its victims, but it does not necessarily curtail their procreative powers, as is often assumed. An examination in Paris of 402 working-class and pauper families, including 81 families of drinkers, showed that drinkers have more children than non-drinkers; but they have considerably more miscarriages, premature labours, and dead children. On the whole, 42 per cent. of drinkers' children die before they reach the first year—that is about 14 per cent. more than the children of other people.† Not all the offspring die. No doubt in a natural state the comparatively smaller number that are born would, as a rule, succumb, handicapped as they often are from the start. The conditions of civilized life, however, are not quite natural; charity and relief step in, after the mischief has been done, to save the debilitated and deformed. Left to themselves, I am sure, many of the feeble-minded would soon cease to trouble us; but it is the pride of countries such as ours that natural elimination of the unfit is prevented. We are so careful of the individual, so careless of the type. In this connection we may reflect that when a toxin finds many victims *in utero*, some of those who escape premature death must only just do so, and can scarcely have an average mental and physical endowment. Some of these individuals may pass as normal up to a certain age, when, in consequence of their original poor stock of vitality, early mental or physical decay will appear.

ALCOHOL AND LACTATION.

There is yet another way in which alcoholism may tend to feeble mental and physical development in the child. At the

* “Interdepartmental Committee on Physical Deterioration,” vol. i., p. 47, 1904.

† A. and F. Leppmann, in Senator and Kaminer's “Health and Disease in Relation to Marriage and the Married State,” p. 1084. London, 1905.

present time in most civilized countries, a considerable number of mothers cannot suckle their children, although they genuinely wish to do so. According to Bunge,* the most common cause of this inability is alcoholism in the mother's father; when a mother cannot suckle she generally transmits that defect to the daughters of the next generation. This observation has not yet been confirmed outside Switzerland, but Bunge's investigations have been conducted on such an extensive scale and with such precautions that there is probably some measure of truth in his conclusions. I need hardly say that I do not consider artificial infant-feeding an essential cause of feeble-mindedness; it merely tends towards degeneracy. At the present time are born a considerable number of potential aments; in the best surroundings they may just hold their own, with bad conditions of nurture they go under.

STATISTICS OF THE EFFECTS OF ALCOHOL.

Such indications as I have laid before you of the possible far-reaching effects of alcohol in a previous generation are fully exemplified in Morel's† interesting work. One of Morel's favourite themes is that whatever deteriorates the individual must deteriorate the race. He distinguishes between natural variation and morbid variation; and after pointing out the great differences effected in the offspring by an alteration in the nutrition of the parents, quotes many well-authenticated cases of idiocy and imbecility as the result of excessive alcoholic indulgence. Morel has an interesting account of the consequences in Sweden of the excessive drinking prevalent there in the early part of the last century, tracing the rapid increase of idiocy, suicide, and criminal offences. He also relates the fact that in his asylum an excessive number of idiots and imbeciles came from the Vosges Mountains, and explains that no other cause could be ascertained there than chronic alcoholism, which also accounted for a large amount of epilepsy.

More recent investigations serve but to confirm those of an earlier age. In 1901 Dr. MacNicholl‡ undertook a study of

* Horsley and Sturge, "Alcohol and the Human Body," p. 327. London, 1907.

† Morel, "Traité des Dégénérescences Physiques, Intellectuelles et Morales de l'Espèce Humaine." Paris, 1857.

‡ Horsley and Sturge, quoting from "A Study of the Effects of Alcohol on School-children," p. 325. London, 1907.

mental deficiency in school-children for the New York Academy of Medicine. Fifty-five thousand school-children were examined, and the habits of the parents with regard to alcohol reported in over 20,000 cases, a number large enough to eliminate the error due to paucity of observation. Of 6,624 children with drinking parents, 53 per cent. were classed as dullards; of 13,523 children with abstaining parents, only 10 per cent. were classed as dullards. The family histories of 3,711 children were traced through three generations with great detail in regard to the taking of alcohol.

Dividing them into two classes—viz., those free from hereditary alcoholic taint, and those with that taint, we find:

1. Of those free from hereditary alcoholic taint, 96 per cent. were proficient, 4 per cent. were dullards, 18 per cent. suffered from some neurosis or organic disease.

2. Of those with hereditary alcoholic taint, 23 per cent. were proficient, 77 per cent. were dullards (and of these more than one-third were very deficient), 76 per cent. suffered from some neurosis or organic disease.

Somewhat similar, though less definite, evidence is furnished from Austria, for at a discussion at the Vienna congress against alcohol, on a paper by Bezzola,* showing that in certain wine-growing districts the majority of imbeciles are conceived at about the period when most drinking takes place, a medical man said that the teachers in wine-growing districts of lower Austria know that a material of very bad scholars in any one year denotes a good vintage six years previously. Dr. Cotton† is responsible for the statement that “among those who support the view that alcoholism in the parents, especially at the time of conception, affects the germ-plasma, and thus injure it by its toxic effects, are Krapelin, Forel, and Bevan-Lewis.”

Many other figures could be quoted from foreign sources showing how many drinkers' children are mentally and physically abnormal, and what a hereditary taint of drunkenness exists among inebriates, epileptics, idiots, and criminals. It would, however, be tedious to do so. It will be more interesting to briefly consider whether similar results have been observed in

* Quoted by A. and F. Leppmann, in Senator and Kaminer's "Health and Disease in Relation to Marriage and the Married State," p. 1091. London, 1905.

† Cotton, "Alcohol as an Ætiological Factor in Mental Disease," *American Journal of Insanity*, April, 1908.

our own country in recent times. As regards the Report of the Royal Commission on the Care and Control of the Feeble-minded, published a few weeks ago, there may be some who are a little disappointed that the report contains no definite pronouncement on this question. We must remember, however, that an investigation into the cause was not really the business of the Commission; no doubt considerations as to the origin were bound to crop up, and a considerable amount of evidence was adduced on this point. Still, when attention had been drawn to the most common source, no more was to be expected; the root of the evil was decided to be an insane or neuropathic inheritance, a conclusion with which the large majority of workers at the problem of the feeble-minded will concur. Careful examination shows that the majority of witnesses who referred to alcohol or were questioned about it regard it as a cause of congenital mental defect; they only differ in their views as to how far it is a principal cause. A few, however, state quite positively that alcohol has little or nothing to do with the matter. In face of the various statistics, it is rather difficult to accept this view, especially if it is stated merely as an opinion. Miss Dendy* said: "I cannot find the very least evidence for drink being the cause of weakness of intellect, except in so far as it causes accident." But just about the time Miss Dendy was stating this to be the case in Manchester, Dr. Lapage† was inquiring into the circumstances of 250 defective children in that city. He has written: "A marked parental history of alcoholism occurred in twenty of my cases, and in five there was no other factor to be noted." Dr. Lapage says he was unable to make a personal inquiry in all the cases, but relied in some of them on the histories collected at the time of admission to special schools. Those who have had experience of both methods will, I think, agree with me that, had Dr. Lapage been able to carry his personal investigations further, the statistics of alcoholism would perhaps have been increased.

When the histories of feeble-minded children in other large towns have been carefully examined, there has always been noted a definite amount of alcoholic heredity. Thus, Dr. E. Powell‡

* "Royal Commission on the Care and Control of the Feeble-minded," vol. i., p. 44, 1908.

† C. Paget Lapage, "Feeble-mindedness in Children." Manchester, 1906.

‡ "Royal Commission on the Care and Control of the Feeble-minded," vol. ii., p. 160, 1908.

recorded 25·1 per cent. in Nottingham, and I found 41·6 per cent. in Birmingham.* Shuttleworth,† Langdon Down,‡ Mott,§ Bevan Lewis,|| Robert Jones,¶ Clouston,** and many other of our leading authorities on congenital mental defect have all described alcoholism as a cause, and most of them have condemned it in good set terms. Perhaps one of the best pieces of work in the direction of elucidating the cause of amentia is that done by Dr. Tredgold,†† who studied a large number of cases, and in 150 obtained "full particulars of the family for at least three, and sometimes four, generations." He found the chief cause to be a neuropathic inheritance, and stated that, "in the absence of neuropathic inheritance, *consumption* and *alcoholism*, if very strongly marked, may produce mental defect." He also stated that these two factors "*accompany* neuropathic inheritance in a considerable number of cases, and no doubt play a contributing rôle in bringing about mental defect." The actual figures show that alcoholism occurred *with* a neuropathic inheritance in 38·5 per cent., and *without* neuropathic inheritance in 8 per cent., making a grand total of alcoholism of 46·5 per cent. In view of what I wish to say about a neuropathic inheritance, it is only fair to Dr. Tredgold to first make a final quotation from his evidence: "As to the *production* of amentia, the importance of grappling with *consumption*, *alcoholism*, and *defective hygienic conditions* generally cannot be too strongly urged, since it is largely to such means that we must look for any appreciable improvement in the mental and physical health of future generations."

NEUROPATHIC INHERITANCE.

To revert now to the term "neuropathic inheritance," it has always seemed to me that at the present time it is much too

* "Royal Commission on the Care and Control of the Feeble-minded," vol. ii., p. 474, 1908.

† Shuttleworth, "Mentally Deficient Children," p. 62. London, 1900.

‡ J. Langdon Down, "Mental Affections of Childhood and Youth," p. 61. London, 1887.

§ "Royal Commission on the Care and Control of the Feeble-minded," vol. i., p. 453, 1908.

|| Bevan Lewis, "Alcohol, Crime, and Insanity," *Journal of Mental Science*, April, 1906.

¶ Robert Jones, "Mental Degradation the Result of Alcohol," *American Journal of Insanity*, July, 1906.

** Clouston, "Mental Diseases," p. 483. Edinburgh, 1904.

†† "Royal Commission on the Care and Control of the Feeble-minded," vol. i., p. 396, 1908.

readily accepted as a sufficient explanation; it is true that Dr. Macpherson* has given us a clear definition of what the term implies, but all the same, it is not the root of the matter. I want to know the cause of a neuropathic inheritance; the heredity must pan out somewhere. Surely we are not going to assume that Cain was neuropathic and Abel not, and that that settles the whole matter for ever. If we were really scientific in our investigations, and never hesitated to call excessive drinking by its right name, it is possible we should assign a little more mental weakness to alcohol than we usually do. Some of the witnesses before the Royal Commission stated that many inebriates are feeble-minded, and drink for that reason; but if they don't tell us how the mental weakness arose, they don't advance our science much. As a matter of fact, an extensive investigation by Dr. Crothers,† of Hartford, Connecticut, U.S.A., showed that when inebriety is a neurosis, it is usually due to parental intemperance. We must remember, too, that Dr. Bevan Lewis,‡ in his interesting paper showing that thermotaxis gives useful indications with regard to the physiological limit of alcohol, states that "the dose of alcohol which transgresses the physiological limit is very small, and in the specially susceptible is very minute indeed."

COMPARATIVE STATISTICS.

Much of the evidence I have quoted so far is not entirely convincing, because it does not discount the rate of alcoholism in the ordinary population; if this is as high, or higher, than among the families where there is amentia the evidence falls to the ground. Bearing this in mind, when Mrs. Hume Pinsent and I arranged for an investigation in Birmingham, we determined to ascertain at the same time the family histories of a group of normal children in the same district as those examined in special schools; 250 mentally defective children were examined, and 100 ordinary children. I have already referred to one important difference between the two groups. As regards an alcoholic heredity in a direct line, we found this obtained in 41·6 per cent. of defective children, but only in 22 per cent. of ordinary children. You will notice that though my figure of 41·6 per cent. is much higher

* John Macpherson, "Morison Lectures," *Journal of Mental Science*, April, 1905.

† W. Lloyd Andriezen, "The Problem of Heredity, with Special Reference to the Pre-embryonic Life," *Journal of Mental Science*, January, 1905.

‡ W. Bevan Lewis, "Alcoholism, Crime, and Insanity," *Journal of Mental Science*, April, 1906.

than that quoted by many investigators, it nearly coincides with Dr. Tredgold's figure for alcoholism. An even higher percentage is quoted by Forel,* who "got Miss J. Koller in her doctor's dissertation to make an exact comparison between the ancestors of 400 persons who were mentally affected, and the same number of normal persons." As a result of this investigation, Forel is able to state that "one-half or three-quarters of the idiots and epileptics can be shown to spring from alcoholic parents, or at least fathers." The reason that most earlier investigators did not find so much was possibly that they did not make a house-to-house visitation, and personally examine the parents. I am not aware of any other extensive investigations in that way in this country, yet no others are quite satisfactory. I did not attempt to pick out how many cases were due to alcoholism, for, as I explained at first, I do not think that possible; my object was to find how far chronic alcoholism was present as an antecedent factor. No doubt, in some of the cases, feeble-mindedness was the cause of the drinking, but I do not believe in always explaining away everything that is bad in that easy way. When I conducted an investigation for the Royal Commission on the Care and Control of the Feeble-minded at Stoke-upon-Trent, I was able to ascertain the early history of many of the work-house inmates; in the case of some chronic alcoholics I was able to state definitely that they had not originally been feeble-minded, or shown any sign of a neuropathic constitution.† A summary of the family histories of the school-children to which I have referred is published in the proceedings of the Royal Commission;‡ they establish one or two important points. In the first place, while it is clear that alcoholism by itself in one individual may apparently do no harm, yet when it is continued for more than one generation, its effect in the production of amentia is very serious. I found that only in 1 per cent. of normal children both father and mother were alcoholic, but among the feeble-minded the figure was 5·2 per cent. My figures also show on analysis that drinking on the part of the mother is more serious than

* Forel, "Hygiene of Nerves and Mind in Health and Disease," translated from the German by Aikins, p. 206. London, 1907.

† Report respecting the Number of the Mentally Defective, including Epileptics, in the District of the Stoke-upon-Trent Union, by W. A. Potts, "Royal Commission on the Care and Control of the Feeble-minded" vol. vi., p. 94, 1908.

‡ "Royal Commission on the Care and Control of the Feeble-minded," vol. ii., Appendix xiii., p. 619, 1908.

when indulged in by the father; thus among defectives the father drank in 27·6 per cent. of cases, which is not twice as much as the 14 per cent. among the normal, but the mother drank in 14 per cent. as compared with 3 per cent. among the normal—a great difference. Bevan Lewis* had previously drawn attention to the influence of maternal drinking in the production of feeble-mindedness.

While dealing with comparative statistics, I must not omit to refer to the work of Dr. Sullivan,† who has made a careful study of degeneracy in the descendants of alcoholic women, eliminating from his statistics those cases with a phthisical, syphilitic, or neurotic taint. He showed that the death-rate among the children of alcoholic women was nearly two and a half times as great as that among the infants of sober mothers of the same stock. He also established a progressively increasing death-rate in the progeny of alcoholic families when three or more children were born to a family, and has also stated‡ that of 219 children of drunken mothers which survived, nine became epileptic, or 4·1 per cent., “whereas in the general mass of the population the frequency of epilepsy averages below $\frac{1}{2}$ per cent.”§

Many other comparative studies, such as that of Demme|| in Berne, have been made of drinkers' and temperate people's families, and all show similar results.

An important side-light is thrown upon the problem by the investigations of Dr. Dewey, of Chicago, into the early life conditions of 200 sane and 200 insane persons, as quoted by Dr. Urquhart¶ in the Morison Lectures, 1907. “Briefly, whatever tended to eugenics found expression in the sane in a higher degree than the insane. For instance, excessive use of alcohol, of tobacco, of tea, of coffee, appears more frequently in the insane

* Bevan Lewis, “Alcohol, Crime, and Insanity,” *Journal of Mental Science*, April, 1906.

† W. Lloyd Andriezen, “The Problem of Heredity, with Special Reference to the Pre-embryonic Life,” *Journal of Mental Science*, January, 1905.

‡ Sullivan, “Interdepartmental Committee on Physical Degeneration,” vol. iii., Appendix xvi.

§ Horsley and Sturge, “Alcohol and the Human Body,” p. 322. London, 1907.

|| Forel, “Hygiene of Nerves and Mind in Health and Disease,” translated from the German by Aikins, p. 208. London, 1907.

¶ Urquhart, “Morison Lectures,” *Journal of Mental Science*, 1907.

families; tuberculosis, insanity, malarial environment follow the same rule. Neglect and poverty, lack of home discipline, defective schooling, were all more apparent among the insane."

CONCLUSIONS THAT MAY BE DRAWN.

In conclusion, I would merely say that it appears to me that the evidence is not clear that alcoholism, by itself, in the father will produce amentia; but it is quite plain that in combination with other bad factors it is a most unfavourable element, while maternal drinking, and drinking continued through more than one generation, are potent influences in mental degeneracy.

COMMUNICATIONS ON DR. W. A. POTTS' PAPER ON "THE RELATION OF ALCOHOL TO FEEBLE-MINDEDNESS."

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DR. POTTS' paper is one of great importance, because it enters into some of the most urgent of the many controversial points connected with the subject of alcoholism and degeneration. Of the facts mentioned and emphasized, that of the greater influence of maternal drinking as compared with the father is very noteworthy; it has been spoken of before, but perhaps not so strongly demonstrated. The fact that many women are unable to suckle their children, though anxious to do so, and that this inability is due to alcoholism in the mother's father—a new series of statistics proving this having been brought out by Bunge—is interesting, as is also the teaching of Bezzola that inebriety and the period when most drinking takes place in the wine-growing districts are in causal relation. As to the effects of alcohol upon chickens, puppies, and some plants, the experiments of Feré, Ridge, and Cushney are quoted with approval, though it is probable that alcohol, even in the smallest doses, is more of a "poison" to them than it is to human beings. What is harmful to one person may be powerless to affect another, and the difficulty that many have is to strike the dividing line between the amount that is innocent