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The indications for treatment from a review of the pathology of neurasthenia are somewhat different from those we have just considered in hysteria. While the mental symptoms are still prominent we do not find it necessary to adopt the isolation treatment. A mistake is very often made in advising neurasthenic patients to start off on a sea voyage before any attempt has been made to improve their physical condition. It is quite true that a change of scene and surroundings, combined with relief from work, is very beneficial in diverting the patient's thoughts from himself and restoring him to a healthier frame of mind. But we have to remember that a neurasthenic is not only jaded in mind and body, and unable to stand the strain of travelling or to take an interest in sightseeing, but he is also suffering from digestive derangements and sleeplessness, and these latter conditions are often aggravated by travelling. I have seen this so often that I am satisfied that we do best for our patients if we first of all put them to bed in the fresh air with quiet and rest, relieve their digestive disturbance by appropriate dieting, secure the free action of the bowels, favour elimination by the skin by warm baths and massaging. We can also improve the state of nutrition of the nervous system by securing oral asepis, by the use of intestinal antiseptics, and by the use of tonics—especially the glycaro-phosphates and the hypophosphites. After a month or so of this treatment you will find that the patient will be much improved physically, and will then be able to profit very considerably by a voyage or by a stay in some health resort.

Special symptoms may require special treatment as they arise, and I would only warn you in conclusion to be most guarded in prescribing sedative drugs—for example, opium, morphine, or heroin—without very careful consideration, owing to the great tendency there is for patients to contract drug habits. In fact, the less we depend on drugs, the more we adopt general hygienic treatment, the greater the amount of good we shall do for patients suffering from the various forms of functional derangement of the nervous system.

A Lecture

ON

LEAD POISONING AND THE RACE.

DELIVERED TO THE EUGENICS EDUCATION SOCIETY,
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FROM the purely physical point of view a nation's strength is measured by its reproductive power and the high percentage of the fitness of its children. In future wars numbers will still count for much, especially if accompanied by good physique, and for more if accompanied by brain power as well. While civilization in one sense multiplies the opportunities of reproduction, human checks are interposed, or there arise conditions which interrupt the normal course of events and prevent pregnancy reaching term. The nation has therefore been asking, not too soon, for some explanation of its declining birth-rate. The employment in factories of women when pregnant, and at a time when they ought to be sparing themselves, is one explanation of a large number of immature births, just as the return of mothers to the factory at too early a date after their confinement is one of the causes of the high death-rate of infants. It is estimated that, on an average among the general population, one of every six pregnancies ends in abortion. Where the conditions of labour make heavy demands upon female workers and tend to exhaustion, the number of immature births in a community rises, for by this means is partly explained the fact

another instance of nervous symptoms, and is restored to a healthy state of mind. The indications for treatment from a review of the pathology of neurasthenia are somewhat different from those we have just considered in hysteria. While the mental symptoms are still prominent we do not find it necessary to adopt the isolation treatment. A mistake is very often made in advising neurasthenic patients to start off on a sea voyage before any attempt has been made to improve their physical condition. It is quite true that a change of scene and surroundings, combined with relief from work, is very beneficial in diverting the patient's thoughts from himself and restoring him to a healthier frame of mind. But we have to remember that a neurasthenic is not only jaded in mind and body, and unable to stand the strain of travelling or to take an interest in sightseeing, but he is also suffering from digestive derangements and sleeplessness, and these latter conditions are often aggravated by travelling. I have seen this so often that I am satisfied that we do best for our patients if we first of all put them to bed in the fresh air with quiet and rest, relieve their digestive disturbance by appropriate dieting, secure the free action of the bowels, favour elimination by the skin by warm baths and massaging. We can also improve the state of nutrition of the nervous system by securing oral asepis, by the use of intestinal antiseptics, and by the use of tonics—especially the glycaro-phosphates and the hypophosphites. After a month or so of this treatment you will find that the patient will be much improved physically, and will then be able to profit very considerably by a voyage or by a stay in some health resort.

To the injurious effects of alcohol upon progeny other lecturers have drawn the attention of this society, as also to the far-reaching consequences of the effects of syphilis. My task to-day, if of a humbler character, since the subject concerns a more restricted number of people, is yet none the less important, for with lead and its compounds we are dealing with poisons whose action, although subtle, is yet unerring, the sadness of it all being that in the larger number of instances the sufferers have done nothing to bring the trouble upon themselves. Their daily occupation, the means by which men and women have sought to earn their living, becomes the cause of illness and possibly of death, of individual physical degeneracy and of inability on the part of women to rise to the dignity of the completed act of motherhood. Nearly two decades have passed since I strove for and succeeded in securing the emancipation of female labour from the dangerous processes of lead-making, and, although for years I was the target of abuse of manufacturers and of some of the Labour societies, events have more than justified the recommendations I made, since the manufacture of white lead has become less the object of public reproach, the financial claims upon the industry have been lightened, and the health of the workers has generally improved. It is difficult to estimate directly and indirectly the gain to mankind by the abolition of female labour in white lead factories, and in all processes wherein lead is used.

A few years ago, in one of the Yorkshire towns, there was an endemic of stillbirths which called for an unofficial inquiry. The cause was found to be contamination by lead of the drinking water supplied to the town. With the removal of the cause, the effect ceased. In this endemic it was the women and children of the population who suffered most severely. There is a sexual idiosyncrasy in lead poisoning which cannot be ignored. Quite apart from its effects upon emunctories such as the kidney, also upon the blood-making organs and the nervous system, lead hits hard the reproductive powers of man and woman, but especially of woman. Lead destroys developing life by directly poisoning it, or it checks the growth of the foetus in the womb by cutting off its channels of nutrition. If fowls' eggs be incubated after painting the shell of some of them with a strong solution of lime and the shell of others with a solution of lead nitrate, I found that, while all those which had been painted with lime came to maturity, from not one of those painted with lead nitrate solution did there come forth a live chick. On opening the egg, the embryo was always found to have reached a fair stage of development; it had died in all probability as the result of poisoning. Similarly in the case of pregnant rabbits, to whom lead was administered in food, the carriage took place, and in the internal organs of the fetuses lead was found on chemical examination. By these experiments is not only confirmed the statement I have made of the frequency of stillbirths among female lead workers, but of the direct transmission of lead as a poison through affected mothers to the offspring.

Whether we deal with life as seen in the lower animals or with woman, this influence of lead in bringing pregnancy to a premature close is generally admitted—a circumstance which of itself is one of the strongest reasons for the exclusion of females from the dangerous processes of

the manufacture and manipulation of lead and its products.

Dr. George Reid, in vol. ii of the Report of the Departmental Committee on the Dangers attendant on the Use of Lead, etc., supplies the following figures which bear upon this point:

Taking 100 mothers, he found that in those engaged in housework the number of miscarriages and of stillbirths was 43.2; mill workers, but not engaged in lead, 47.6; mothers who worked in lead previous to their marriage, 86; mothers who became lead workers after marriage, 133.5; and where the father was a lead worker, 48.

In addition, he found that while the deaths under 1 year per 1,000 births were for mothers engaged in housework 150, mill workers 214, where the father alone worked in lead 189, mothers working in lead before marriage 157, and when mothers worked in lead after marriage the numbers rose to 271.

That is to say, females who worked in lead before marriage miscarried twice more frequently and females working in lead after their marriage miscarried three times more frequently than those engaged in ordinary housework. Taking the manufacture of pottery as an industry in which lead compounds are used, Reid found that the incidence of poisoning is most marked in females engaged in the dipping department, and next to these plumbism prevails most among the majolica painters. It is difficult to obtain accurate figures in an inquiry like that which Dr. Reid carried out, for many women are unwilling to divulge such personal matters as concern their possible motherhood, especially when the influence of their occupation is being called in question.

The facts which I have just related are of interest from a national point of view, since they deal with an enormous loss of infantile life from immaturity and still births. A high percentage of the children born to lead workers die shortly after birth and during the first few months of life. In a footnote of the Departmental Report to which I have referred it is stated:

It does not appear from the Tables that working in lead has any injurious influence in lowering the birth-rate, nor is there any evidence to show that the children of lead workers are any less healthy than those born of non-lead workers.

The fact that female lead workers miscarry more frequently than pregnant women following other occupations, shows that the birth-rate is adversely affected. It is to the question whether the children of lead workers are any less healthy than those born of non-lead workers that I am desirous of drawing your attention. In previous addresses I have shown that, where a pregnant female lead worker who has miscarried time after time, frequently six times in succession, leaves the factory, succeeding pregnancies are brought to a successful close and the children born alive, live and grow up. What becomes of these children, and what, too, is the fate of those children born alive to lead workers who do not die within the first few months after birth? It is contrary to expectation, although not to our experience, that the children who survive should be quite healthy, for in the bodies of the stillborn children of lead workers and in those of children dying shortly after birth, lead has been found in the tissues, to the presence of which death must be attributed. In most instances, if not in all, it must be simply a question of dosage of the poison, so that where children born under these circumstances survive their birth, the amount of lead in their system is too small to kill, or there has been no poison absorbed at all. Analogous cases are seen in syphilis where a syphilitic mother has a succession of stillborn children, and then one or two children are born who survive, or where a father who has been infected is yet the parent of apparently healthy children. Some of the children, although healthy looking and well nourished when born, develop symptoms of congenital syphilis a few weeks after birth, while others grow up and appear to be healthy children—but are they quite healthy? Does not the something which has been inherited influence them in the ordinary infantile illnesses they may perchance suffer from, or in later years show itself in some of those obscure forms of nervous disease which are often inexplicable? Many asylum physicians to-day believe that such a malady, for example, as general paralysis in middle-aged men is in many instances the result of congenital syphilis, even although the patients have never presented the ordinary physical signs met with in the inherited form

of that illness. Infants of an alcoholic mother frequently die of malnutrition weeks after birth, while others survive, but only to exhibit in later years an instability of the nervous system, and a liability to become not only more readily intoxicated by alcohol, but to be affected by it in a manner different to other people.

It is with lead as with alcohol and syphilis, children may not only be born apparently healthy but really so, and remain as healthy and develop as well as the children of parents who have never been brought into contact with lead, but there are others who must retain some impress of the transmitted maternal toxæmia, although it is impossible to state the peculiar direction along which that impression will show itself. The subject of plumbism bristles with biological problems of extreme difficulty, as shown by the following circumstances. Female lead workers give a higher percentage of stillbirths (Dr. Prendergast of Hanley states that one potter's wife miscarried twelve times in succession) than women employed in other occupations, and in the body of the children lead is found, which probably caused their death, while the mothers have not and do not exhibit any signs of lead poisoning. It is interesting to remember that latent paternal and maternal plumbism is fatal to offspring, while the parents remain to all appearance in good health, and yet experience shows that Nemesia may still overtake these parents years after they have ceased working in lead. Acute poisoning from any cause is peculiar in this respect, that death can occur without any structural alteration of the tissues being observed, although on chemical examination the poison can be detected. In the liver of the still-born infants of lead workers lead has been found. Acute lead poisoning in the adult can be recovered from. A person may take a large dose of lead acetate and suffer in consequence, but provided no more of the poison is taken it will be eliminated from the body and the individual will recover. It is quite another thing when small quantities, each harmless in itself, are taken regularly into the system, over an extended period, as at work, or in drinking water.

Lead poisoning develops insidiously; the metal acts upon the cells of particular organs of the body, deranging their function and structure, so that life is gradually brought to a close by the intervention of disease of organs, such as the kidney or nervous system, years after it may be the person has been near lead. It is not to be expected that actual disease of organs is transmitted by lead-poisoned parents to their offspring, although, as we have seen, lead itself can pass from the maternal organism to the fetus, but from the poisoned blood of the mother there cannot be added to the stream which nourishes the child in her womb those healthy materials which make for normal development. Something is given or withheld which cannot but influence in later years the behaviour of the tissues to the ordinary demands which life imposes upon them. Dr. Prendergast of Hanley, Staffordshire, who has spent many years of his professional career in the Potteries, tells me that in his experience the children of lead workers who survive the first year of life are of an inferior physique to other children. They suffer from marasmus, and have not the average vital stamina. He knows of nothing which tends to deteriorate the physical well-being of children so much as the fact of a father or mother having been brought into contact with lead, especially if the lead had been absorbed in fairly toxic quantities. Dr. Prendergast is of the opinion that the children of lead-poisoned potters do not grow up into capable men and women like other children, but that they are handicapped in their start in life, and that subsequently many of them exhibit signs of mental as well as physical deterioration.

Twenty years ago an unmarried female lead worker was under my care in the Newn-ke Royal Infirmary on account of convulsions and blindness caused by lead. Four months afterwards she had pretty well regained her sight, and the other symptoms of plumbism had disappeared. Acting on my advice she did not return to the lead works. A few years afterwards she married; her husband was an outdoor labourer. In 1905 this patient was readmitted into the Infirmary on account of paralysis of the eyeballs. She had had three miscarriages and six living children; one of the children has since died. Although it was seventeen years since she had worked in the factory, Professor Rodon found lead in this patient's urine. Her children, whom I have seen, are healthy and compare favourably with the children of healthy parents, although the patient herself has recently become almost blind.

Mrs. M., aged 42, an old lead worker, has had twelve children, six of whom are alive. Two of the daughters, aged 23 and 25, although of her build and short stature, can work healthily. Mrs. L., aged 43, formerly a white-lead worker, has had four children, three of whom are alive, and one child only at the age of 4 months and another 3 days after its birth. It was one miscarriage; two sons have been spared to her and are grown up; one of the sons, aged 12, is in the army, the other is said to be quite well, and is following his occupation as a musician.

Mrs. A., aged 35, whose husband is a labourer, was a white-lead worker for six years before her marriage and for three years after it. She gave up the work for a year after. She has had four children, three of them stillborn, her only child, a boy of 11 years of age, is healthy. When I asked this woman to give me the names of some of the women who as girls used to work in the white-lead factory with her, she at once exclaimed, "They are nearly all dead," and that her own mother, Mrs. N., who had also been a lead worker, had died at the age of 53 from the effects of lead.

To see the worst effects of lead upon a people who are following an occupation for a living one must go to Hungary. Struck by the harrowing details of the suffering experienced by the small pottery manufacturers of Hungary and the unusually severe types of plumbism which prevailed among the women and children, I visited that country eighteen months ago, to study the problem on the spot. I have seen a considerable amount of lead poisoning both at home, in France, and elsewhere, but I have seen nothing to equal the sad sights I witnessed in Hungary. Through the kindness of Mr. Cetranyi, then Home Secretary, who placed at my disposal one of the Royal Inspectors of Factories, I had the opportunity of visiting several of the out-of-the-way villages where the making of cheap pottery is a home industry. As the work is often carried on in the living and sleeping rooms, the whole family is living constantly in a poisoned atmosphere, hence the readiness with which plumbism occurs in husband, wife, and children. But setting aside these cases where the children suffer from plumbism the result of inhaling lead dust in the atmosphere of the living room of the house, there are scores of lead-impregnated potters and their wives, who are not necessarily ill or laid off work, and, as Dr. Adalbert Chyzer showed, the children of these persons are frequently the subject of rickets; the outline of their skull is angular, the ends of their long bones are swollen and club-shaped, while owing to the rickety condition of their jaw the teeth are irregular. Owing to their wives so frequently miscarriage, potters in Hungary have few children, seldom more than one or two, and the children who are spared to them grow slowly, are of short stature, and are frequently almost dwarfs. In some of the villages the majority of the potters have no children at all—not one of the infants born alive had survived. In these villages the children die from hydrocephalus, from acute meningitis, or in convulsions. Dr. Chyzer found "fits" to be much more frequent in the children of potters than in those of other people. At Temerin, in one potter's family seven children had died in convulsions; in another potter's family six children had thus died. Where death does not take place in early infancy from convulsions, epilepsy is found later on to be more frequent in the children of potters than in those of non-potters. In fact, apart from the transmission of the worst effects of such poisons as syphilis, plumbism is one of the most serious destroyers of infantile life.

The manufacture of pottery in Hungary as a home industry is, when the circumstances permit of it, frequently an hereditary occupation. In Varpaloto Dr. Chyzer found a potter and his family whose respective heights were as follows:

Father	...	...	...	5 ft. 3½ in.
Mother	...	...	...	4 ft. 9 in.
Elder daughter, 28 years of age	...	...	...	3 ft. 10½ in.
Son, 27 years of age	...	...	...	4 ft. 9 in.
Younger daughter, 9 years of age	...	...	...	2 ft. 5½ in.

In some of the villages I was struck by the short stature of the potters as a class. Men of 21 and 22 years of age looked like boys of 14. Infantilism is therefore one of the effects of inherited plumbism. In families where the mother has miscarried on several occasions the children who survive are frequently idiotic, or they are feeble mentally and physically, and always ailing.

It is characteristic of most infectious diseases that once attack renders a person immune to subsequent attacks.

As a result of the action of toxin developed by micro-organisms, there occurs a reaction on the part of the white corpuscles of the blood and the cells of the tissues, whereby antibodies are formed. These, by overbalancing the toxin, not only bring about cure of the disease, but they leave behind a protective influence in the body which lasts for years. There is, however, not always this immunity conferred. One attack of pneumonia, for example, rather renders the individual liable to a second attack than protects him against it. This increased susceptibility to a return of the same disease is called anaphylaxis. It is characteristic of recovery from plumbism that fresh contact with lead is followed by a really recurrence of the malady, hence the serious consequences to lead workers who trifle with the dangers to which they are exposed in their occupation. Familiarity with danger frequently causes workmen to become careless, but the risks remain none the less, and too frequently they trip up the unwary. Anaphylaxis, or increased susceptibility, is characteristic of many metallic poisons, but not in all, as witness the arsenic-eating capabilities of the mountain peasantry of the Austrian Tyrol, who, commencing with small doses of arsenic to increase the staying power of the individual and improve his breathing capacity, finally end by taking larger and larger doses with immunity. Opium eating is another illustration of the same fact. Occasionally a degree of immunity is met with in plumbism also, but it is so rare that it in no way diminishes the need for constant care on the part of lead workers in their occupation; for, as already stated, it is the repeated entrance of minute quantities of lead into the body, and not of one or two large doses, which give rise to the worst types of plumbism.

Improvement of the industrial conditions of the potteries and abolition of female labour in white-lead factories have removed so many of the evils of plumbism as they affect potential motherhood, that in Great Britain it is difficult to say to what extent plumbism is injuriously influencing the future of the race. It is probably necessary that unhealthy conditions should operate through three or four generations before any permanent effect can be seen in a people; but already in Hungary, and less in Staffordshire, there are signs that the development of child life is to some extent being interfered with. The influence upon offspring of paternal and maternal lead intoxication is still a subject for careful inquiry. The fact that the wives of men working in lead miscreary more frequently than the wives of men following other occupations, and that the tendency is greater when the women themselves work in lead, shows that the embryo is unhealthy. Where life is brought into existence under these circumstances and the infant survives its birth, well might we ask whether it can ever throw off the influence of lead.

Industrial legislation has accomplished much, but although it is known to have benefited both the workers and the trade generally, there are yet many of the workers who raise objections to it. They claim the right to work even in unhealthy occupations without State restrictions. There are others, too, who do all they possibly can to shirk the medical examinations, and who are indifferent to the regulations for the prevention of plumbism. Fortunately these persons are few. Rules may be irksome, and compliance with them may entail considerable personal inconvenience, but if employers will do all they can to make them as little irksome as possible, then, since the objects which it is wishful to be secured are health, fitness for work, and longevity, the workers in the long run are sure to realize that the end justifies the means that have been recommended.

UNDER the will of the late Mr. Holmes Wright of Bingley, Yorkshire, Bingley Cottage Hospital receives a donation of £1,000.

AT the tuberculosis hospital for the children of Paris, at Berck-sur-Mer, near Calais, a short post-graduate course is to be held in August. The fee is 50 francs. Other information can be obtained on application to Dr. Calvé, Berck Plage, Pas de Calais, France.

THE Hospitals Committee of the City of Berlin has decided that the nature of the diseases from which a patient is suffering shall not be indicated on the board at his bedside. In surgical wards the disease will be denoted by the first syllable of its Latin name.