method of treatment. The conditions under which it may become so are being investigated. The endeavour must be to procure a substance, radio-active or not, which, when introduced into the general circulation, will influence morbid processes in the tissues. It may be possible to use a substance which when treated locally by radium, x rays, or other agents capable of exciting the secondary radiations of such substances, will benefit the tissues.

The best we have yet been able to do has been by local stimulation to produce secondary radiations from the tissues, blood, and lymph in the deposits of cancer. When the secondary radiation value of these tissues is better known, and when we know which particular radiation acting upon them will give us their maximum value, then we may hope to improve our results.

CONCLUSIONS.

1. In all cases of early cancer the operative method is undoubtedly the best; it is quicker, safer, and offers the best prospect of cure.

2. Radium is a useful adjunct to the treatment of all cases, first as a prophylactic after operation, and, failing operation, the next best method we possess. It must, however, be stated that x rays are in selected cases quite as useful as radium.

3. In patients who refuse operation, or are for other reasons not suitable for operation, radium is a useful remedy.

4. In inoperable cases radium may help to render the case operable; and, failing that, is undoubtedly useful as a palliative measure.

DIACHYLON OR DUTY: A CALL TO ACTION.

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It is now several years since I drew attention to the fact that not only is the female white lead worker more pre-disposed than the male to plumbism, and to the worst types of it, but that lead probably exercises its baneful influence upon her through the medium of the reproductive organs. A female lead worker, if pregnant, frequently miscarries, so that expected maternity in many instances can only be realized by women when *enceinte* keeping away from the lead works altogether. In pressing the Home Office, through the White Lead Committee, of which I was a member, to abolish female labour in the dangerous processes of lead manufacture or where lead compounds are manipulated, I based the recommendations upon the idiosyncrasy of the female sex generally, upon the disastrous effects of lead upon offspring born either prematurely or at term, and also upon the fact that most of the children born of women who work in lead die from convulsions a few hours or several days after birth. Experience has shown that by the abolition of female labour in the dangerous processes of lead manufacture, both in this country and abroad, not only has much suffering been spared and loss of expectant life to the race been averted, but that actual benefits have been conferred upon the industry itself. Public opinion is less hostile to the trade than it was, and there has been less sickness among the employed, while the manufacturers have saved considerable sums of money, owing to fewer claims than they otherwise would have had under the Workmen's Compensation Act.

Since such admitted benefits have followed the prohibition of female labour in the dangerous processes of lead-making a comparatively new problem of plumbism in female life must now be faced. Medical men in the potteries and elsewhere have repeatedly drawn attention to the fact that, for the purpose of procuring abortion, pills made from diachylon plaster are frequently taken, so that it is unfair to regard all the cases of plumbism occurring in female workers in the potteries as arising from occupation. This announcement has not been acceptable to a section of the reforming public, who, while admitting

that such a practice probably exists, can only regard it as of limited extent, and as a statement put forward by interested persons to prevent further legislation for the protection of females working in lead processes in the manufacture of pottery. The self-administration of diachylon pills by pregnant women for the purpose of procuring abortion is a practice more widely indulged in and with more serious consequences than at first sight appears. The time has come when something must be done, and that at once, to put an end to a practice in some instances followed by death, though the cause is not always recognized, and in more instances by acute suffering and by protracted illness.

Several medical men have written upon the subject, of whom from memory I may allude to Dr. Handford of Nottingham, Drs. Prendergast, Shufflebotham, and Ward of Staffordshire.

During the last two years I have seen seven or eight cases of acute plumbism in married women who had taken diachylon. Two of them just escaped dying, while two others will probably never be the healthy women they were previously to their illness.

CASE I.

A woman, aged 40, pregnant, mother of eleven children, ten of whom are alive, was admitted into the Royal Victoria Infirmary under my care on June 9th, 1911, suffering from severe pains in the abdomen and great weakness of the limbs. Three months before this, believing herself to be pregnant, she took in all 40 diachylon pills. After taking two pills night and morning for ten days she became seriously ill. She had acute abdominal pain and repeated vomiting; she felt listless and was so weak that she could hardly stand. On her admission the menses had not been re-established; there was a marked blue line on the gums, absence of sulpho-cyanide in the saliva, and complaint of pains in the arms and legs. On two occasions albumen was present in the urine. A large tender mass could be felt in the lower part of the abdomen in the middle line corresponding to an enlarged uterus in the fifth month of pregnancy. On examining the blood the red corpuscles numbered 2,400,000 and the white cells 11,000 per c.mm. No lead was found in the urine by Professor Bedson. Under the administration of $\frac{1}{2}$ grain of sodium monosulphite with tincture of cardamoms in water thrice daily, and an occasional opiate when the pain was severe, the patient made a good recovery, left the infirmary on July 7th, and in due course was delivered of a healthy child at term.

CASE II.

A married woman, aged 29, with four children, was admitted into the infirmary under my care on July 18th, 1911, suffering from severe pains in the abdomen and back. She was in a highly strung and nervous condition. Believing herself to be pregnant, she had taken "black stick"—a mixture of diachylon and aloes—in the form of pills, sold to her by a chemist. She took six pills night and morning for the first week, and half that number for the second week. Severe abdominal pain developed, and she miscarried on July 14th, about seventeen days after taking the first pills. For five days previously to miscarrying she had fairly free but interrupted uterine haemorrhage.

She vomited several times daily, and continued to do so for a few days after entering the infirmary on July 18th. There was neither diarrhoea nor constipation, but severe pain during defaecation. She had lost considerably in weight. Her legs were so weak that she could hardly stand. There were tremors of the lower half of the face, and also of the hands. There was not only a dark-blue line on the gums, but a patch of deeply pigmented buccal mucous membrane opposite the lower teeth. The abdomen was extremely tender, especially over the left ovarian region. The knee-jerks and the plantar reflex were lost. On microscopical examination of the blood, which was repeated on several occasions, only once were four basophile corpuscles found over the whole field. The urine was free from albumen on admission. A few days after treatment had been commenced the urine contained a trace of albumen, but this disappeared, and was never again found. On one occasion only was lead found in the urine by Professor Bedson, and that was after the commencement of the administration of sodium monosulphite, which formed the regular treatment throughout, and under which she made a good recovery, leaving the infirmary on August 28th. This woman had taken 144 pills, each of which contained 1 grain of oleate and stearate of lead.

In one woman whom I saw with Dr. Nesham at the Maternity Hospital, and who had taken a pennyworth of diachylon and a pennyworth of aloes, the abortion, was incomplete, and curetting had to be resorted to. In another whom I saw with Dr. Tiplady the symptoms were those of abdominal pain and intractable vomiting, to which the patient all but succumbed. She too had aborted, and presented temporary albuminuria.

I will only mention one other case, and that with the permission of my colleague, Professor Thomas Beattie, in

whose ward I have had the opportunity of frequently seeing and examining the patient.

CASE III.

A married woman, aged 24, the mother of two children born within the period of one year and two weeks, had taken "black stick" with the object of inducing abortion. Seven days after taking the drug she aborted. Two weeks afterwards she was seized with severe headache and vomiting. There was neither colic nor constipation. A month after taking the pills the right hand, and shortly afterwards the left, became paralysed, and then both legs. The muscles of hands and legs rapidly atrophied. There was a blue line on the gums, and marked naso-labial tremor. The urine was free from albumen. Professor Bedson found a trace of lead in the urine. Blood films were stained and carefully examined, but on no occasion was one basophile corpuscle found. It is now five months since this patient took ill, and although her legs have partly recovered their power, there is still almost complete double wrist-drop, so that she lies in bed in a comparatively helpless condition. It will be months before she is better, and even then it is a question as to the completeness of her recovery.

There is not the least doubt that lead is a powerful and a dangerous ecboic. It probably acts upon the unstriated muscle fibre of the uterus, setting up strong muscular contractions followed by expulsion of the fetus. I am disposed to take this view rather than that lead destroys the fetus first. Pregnant rabbits to whom I administered lead miscarried, and in one instance so severe were the muscular contractions that the uterus ruptured.

The dangers following the self-administration of diachylon are not only that the woman may have a long and painful illness, accompanied or not by paralysis of hands and limbs, but that she may die in the attack of acute plumbism, either from intractable vomiting, acute inflammatory affections of the pelvis consequent upon incomplete abortion, or from convulsions. To my knowledge young females, married and unmarried, have been admitted into hospitals or been treated by medical men outside, and have died in convulsions or from recurrent vomiting, and at the *post-mortem* examination nothing has been found to explain either the symptoms or the death. In a few of these it was afterwards ascertained that diachylon had been taken.

What, then, is the duty of women, the Government, and the medical profession in regard to this important question? Disciples of Malthus would probably maintain that there is something to commend in the action, not the means, by which when patient Case I, in her twelfth pregnancy, with ten children alive, the eldest only 18 years of age, and her husband earning 30s. a week, finding herself pregnant, sought to relieve herself of a prospective burden by a remedy so easily obtained as diachylon. It would have been a greater and more disastrous calamity to the husband and to the family had this woman died and left ten children to be brought up, the eldest daughter being only 18 years of age. Where the means to procure abortion are attended by such risks to life and health it is the wiser plan for women not to take anything. It is the light-hearted manner in which unmarried and young married women, in their eagerness to avoid responsibilities and the assumption of tasks which interfere with their pleasure, resort to the use of diachylon that calls for condemnation.

Seeing that for two pence abortion can be procured, and that women in the guise of nurses are secretly preaching the advisability and encouraging the practice of it among the poorer working classes, also that in the full glare of daylight druggists are selling the material, surely the time has come when we might well ask the question how long the Government is going to allow this state of things to continue? It can no longer be said that the Government is ignorant of the practice nor of the extent to which it prevails. The responsibility rests with it to put a stop to a practice which is discreditable to the age in which we live, a source of danger to adult female life, and a cause of antenatal death. The sale of diachylon should be prohibited. Soap plaster can be made, and just as effectively, without lead as with it. By the prohibition two years ago of white phosphorus in the manufacture of lucifer matches, and which was also resorted to as an abortifacient, death has been averted and much suffering has been prevented. This, too, would be the case if the sale of diachylon or of lead pills, unless the latter under medical prescription, was made a criminal offence.

Notification of industrial lead poisoning is compulsory; why should lead poisoning by diachylon be made the occasion of its evasion?

The attitude of the medical profession has in this matter been consistent. Its duty is simple: it is to discourage by all means the use of such a drug; to point out to women, wherever possible, the grave danger to life and health attendant upon its administration, also to comply with the wish of the Government, should such be expressed, to notify, on the same terms as those concerning industrial plumbism, the occurrence of lead poisoning by diachylon or by any other medicament.

THE USE OF CELLULOID IN THE TREATMENT OF TUBERCULOUS DISEASE OF THE SPINE.*

[WITH SPECIAL PLATE.]

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CELLULOID was first introduced into orthopaedic surgery by Phelps and Lorenz, both of whom used it for splint manufacture in the form of sheets softened in hot water. Later, Landerer and Kirch in Germany and Ducroquet and Calot in France rendered its employment more practical by conceiving the idea of dissolving the celluloid in acetone and applying the solution to woven tissues. In France its use is now very general. At Alton it has been adopted to the almost entire exclusion of other removable spinal supports, and the interest which these jackets has created is my apology for this paper.

For my acquaintance with celluloid for orthopaedic purposes I am indebted to my friend Dr. Jacques Calvé, of Berck, who first instructed me in its use and has devised a particularly ingenious and useful jacket, which is described in his paper referred to below.¹

CHEMISTRY OF CELLULOID.

Celluloid is made by gelatinizing nitro-cellulose of low nitration with an alcoholic solution of camphor. The alcohol is nearly all driven off during the subsequent process of manufacture, leaving an intimate mixture of nitro-cellulose and camphor. It is uncertain to whom its original discovery can be certainly attributed. Parkes, in Wales, early in the fifties, patented a process for preparing a substance, which he afterwards called "Parkesine," prepared from pyroxylin. In 1869 the Hyatt Brothers, in America, made xyloid, which was essentially celluloid, and in 1877 the business of Daniel Spill, who was Parkes's successor, was taken over by the British Xylonite Company, Ltd. In 1876 the Hyatt Brothers founded the first celluloid factory in France.

Transparent celluloid is a hard, tough, somewhat elastic substance of horny appearance. Its chemical composition is not constant but may vary within considerable limits according to the method of its manufacture. Its density is about 1.37. It is softened by heat, but if kept too long at a temperature of 130–140° C. slowly decomposes; at a temperature of 198° C. it decomposes instantly. It is highly inflammable. It is soluble in various substances, of which acetone alone concerns us here. It may be decomposed by concentrated sulphuric, nitric, and hydrochloric acids.†

THE ADVANTAGE OF CELLULOID SPINAL JACKETS.

Jackets made of this material are light, elegant, rigid but slightly elastic, strong, are not acted upon by the heat and moisture of the body, maintain their shape indefinitely, are comparatively easy to make. Their greatest value lies in the fact that they may be made to accurately fit a cast of the patient and maintain the shape of this cast indefinitely.

The great objection to the use of celluloid is its inflammability. Impregnated, however, in woven tissues there is very little danger in its use. Both in France and in

* A paper read before the Medical Society of London.

† For kindly confirming the accuracy of this paragraph I am indebted to Mr. T. R. Brooke, of the British Xylonite Company.