generally more or less red and inflamed; if cancerous, not so. Tenderness and heat indicate tuberculosis rather than cancer.

In the diagnosis between tuberculous and primary cancerous lymph glands in old people the chief indications of cancer are hardness, close-clustering, deep-seated attachments and quick increase. In the cervical glands, which in old persons are the most frequent seats of both tubercle and cancer, the lower glands are generally tuberculous, the upper cancerous; the soft primary cancerous disease is very rare in the old. Cancerous disease in the old is often secondary to some comparatively trivial primary disease, tuberculous is very rarely so.

As age advances rest and warmth and nourishing food become more important than any treatment by cod-liver oil or iron or iodine, or even sea or mountain air.

It is remarkable that many persons have attained a great age under very insanitary conditions—in defiance of them, as it were. We sometimes hear the great ages of certain persons in a district quoted as evidence of the good sanitary state of the village or town, whereas a large proportion of the inhabitants may have died young, while some survivors, inured to the evil surroundings, may have attained to great age, thus exemplifying the ability of the human body to adapt itself to varying and even unfavourable conditions.

The power of repair after injury and disease which is shown by some very old people is interesting and remarkable. Fractures (excepting the well-known fracture of the neck of femur) often unite as quickly as in younger persons, and wounds and ulcers often heal rapidly. It seems as though the nutritive efforts requisite for the work of healing may possibly take place more quietly and smoothly, with less of that nerve irritation and of haste which is incompatible with good speed or safe progress.

It is always of the greatest importance to ensure regular and efficient action of the bowels by attention to diet and the administration of laxative drugs with tonic action, for example, cascara, colocynth, or aloin, with belladonna and strychnine. Saline aperients are as a rule too "cold" for the aged, and when administered must be combined with aromatics.

A dose of calomel may frequently be given with much benefit to the old and those who are not very unsound. Its marked antiseptic qualities are very beneficial in purifying the alimentary tract, and so clearing out noxious bacterial toxins of gastro-intestinal origin which give rise to many cases of chronic toxæmia ending even in general paralysis or tabes dorsalis. Few remedies are more useful in many cases of bronchitis with dyspnoea and inefficient expectoration in old people than a good purge, for example, the pulv. jalapa co.; it not only produces copious serous motions, but also acts on the kidneys, and thus, so to speak, drains the lungs.

Diuretics, especially potassium acetate, are valuable where the skin is altered in structure with advancing years, and does not perspire. They seem to take the place of diaphoretics, which often fail in old people. Digitalis is apt to impair appetite, but with blue pill and squill it is a highly satisfactory diuretic and tonic in the bronchitis and heart failure of the aged. Asthma in old people is often the consequence of retrocession of gout, the disappearance of skin eruptions or cessation of discharges, especially in thin persons of neurotic disposition. The association of angina pectoris with gout and atheroma is well known; both conditions are generally relieved by sodium nitrite or nitroglycerine.

It must be remembered that emphysematous and bronchitic old persons are a chilly race who make little heat because of the impairment of chemical interchanges in their lungs; consequently their body heat must be preserved to the utmost by nourishing food and wine, by a warm atmosphere and light warm clothing. The value of ammonia, strychnine, and ipecacuanha as stimulants to the respiratory centre is now fully realized. Another very useful help in this condition is the inhalation of strong turpentine vapour off boiling water.

Quinine has been called the iron of old age, and no doubt it is useful, but it should be given with aromatics or it may cause some discomfort to the urinary system.

Good wine is among the best of tonics for debility accompanying disease in advanced life. As "Milk is the wine of infancy, so wine is the milk of old age."

In that painful malady of old men, prostatic enlargement and its consequences, antiseptic and regular use of the catheter are paramount, and where any residual urine remains, washing out the bladder with a solution of boric acid or quinine or iodoform-emulsion (also requisite in cases of para-

plegia where the bladder becomes foul), the internal administration also of urotropine, sodium salicylate or salol and benzoates are necessary. Lately the simple operation of vasectomy has led to more or less atrophy of the prostate and considerable relief, and the more formidable operation for complete removal of the prostate itself is full of promise, and has in recorded cases been most successful.

I will not occupy time by speaking of gangrene, passive hæmaturia, and prurigo senilis except to say that this last may be due chiefly to retention of urine solids or bile acids in the blood, and is common in persons with gouty kidneys. A blue pill at bedtime, and saline aperient the following morning will often give great relief to the intolerable itching, if followed by the use of uric acid solvents and the reduction of nitrogenous food.

A word about exercise. Long livers have usually been early risers and good walkers. Nothing so effectually promotes the more equable distribution of the blood and averts the constant tendency to local congestion in the brain or abdomen as walking exercise. Its salutary influence on the functions of the lungs and skin is well known, and a good walker can generally do without the stimulus of alcohol; so that a healthy old man may say:

Therefore my age is as a lusty winter—
Frosty, but kindly.

PRELIMINARY NOTE ON THE PARASITES OF SMALL-POX AND CHICKEN-POX.

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INVESTIGATIONS carried on during the past five years upon the morphology and development of the parasites of small-pox and chicken-pox have led us to formulate the following tentative conclusions:

1. There are present in the blood of persons suffering from hæmorrhagic small-pox small spherical bodies, highly refractive, and in general appearance simulating small globules of fat. These do not stain, however, with osmic acid, nor with any of the usual basic or acid stains. In hæmorrhagic cases they were found in considerable numbers from the third or fourth day till death. Similar bodies were found, though in much smaller numbers, in cases of confluent small-pox from the third or fourth day, till the end of the first week or occasionally even later and abundantly in the prodromal stages of both small-pox and chicken-pox. These bodies were quite unlike, both in appearance and staining reaction, any of the ordinary histological or pathological constituents of the blood, and are much larger than hæmoconia (size 1-5 μ).

2. In sections of the skin containing hæmorrhages similar bodies are found among the extravasated blood corpuscles, but these seem to differ from the objects just referred to as being found in the blood stream, in so far that they stain, though very faintly, with both basic and acid stains.

3. In the lymph spaces and in some of the smallest blood vessels of the skin, subjacent to the cells of the epithelial layer are found groups of small spherical bodies considerably larger than staphylococci and staining with considerable difficulty. Their affinity for the ordinary stains seems to vary considerably, as in some cases the staining is comparatively faint though more distinct than that of the bodies found in the hæmorrhages while in other cases the staining is decided and comparatively deep.

4. In the lymph spaces of the skin and especially in those immediately adjacent to the basement membrane of the epithelium, which are often much dilated in cases of hæmorrhagic small-pox, there are found considerable numbers of small spherical bodies more closely grouped in certain situations than in others; these are larger than streptococci and stain with comparative ease with most basic dyes. These commonly assume a peculiar purplish tint different from the green presented by cocci and nuclei when Ehrlich's triacid stain is the reagent employed. The deeper groups of these bodies are often very conspicuous even in parts where there is no evidence of cellular or nuclear degeneration.

5. In sections of the skin taken from cases where the eruption is moderately advanced bodies such as are described are present and can be recognized in large numbers in the

epithelial layers. When associated with remains of disintegrating nuclei their presence is detected with difficulty.

6. In smears from vesicles bodies the same as those discussed in paragraphs 4 and 5 or at least having like staining reactions are also found and in the sections of the skin taken in the papular stages of the eruption similar bodies are present in the lymph exuded among the epithelial cells. Bodies having the same characters are sometimes present in small numbers in the blood of patients suffering from haemorrhagic small-pox.

7. In smears taken from the pocks in the later stages of the eruption, within certain of the cells small clear bodies may be seen which stain very faintly with ordinary reagents. In smears of gradually-increasing age these clear bodies are seen to increase in size until they occupy the greater part of the cell, and in smears taken at still later date these bodies are found apparently in a free state. They still stain very faintly, and present no appearance of a nucleus.

8. The absence of pyogenic micro-organisms, both from smears and skin sections, is very striking in the haemorrhagic cases, and during the earlier stage of the rash in those cases in which the eruption ultimately became pustular. Out of seventeen haemorrhagic cases examined, only three showed pyogenic organisms in sections of the skin. In one of them cocci were present in the vessels in which they formed minute thrombi; in a second case a bipolar-staining bacillus was found in groups in the corium; and in a third case both cocci and bacillus just referred to were associated.

9. Towards the end of the vesicular and in the pustular stage pyogenic organisms are frequently found in sections, smears, and cultures.

10. Appearances similar to those described as being present in smears, vesicles, and pustules of the skin in variola occur also in varicella.

In haemorrhagic and in confluent cases of small-pox, pyogenic organisms are very commonly found in the blood; these, however, are probably to be regarded as a result of accidental contaminations of the blood stream by absorption of organisms, in haemorrhagic cases probably from the lungs, in sections of which cocci are found in immense numbers, and in confluent cases by absorption from the skin, and possibly from the lungs also.

AN IMPROVED METHOD OF TESTING FOR LEAD IN URINE,

WITH SOME NOTES ON THE CONTINUED PREVALENCE OF DIACHYLON POISONING IN THE MIDLANDS.

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The object of this paper is threefold:

I. To remind members of our profession how common is the use of diachylon as an abortifacient in the midlands.

II. To criticize the magnesium wire deposition test for lead in urine.

III. To bring to notice a modification of the electrolytic test of great delicacy and simplicity, which has been used by Mr. S. R. Trotman for some time with much success.

I. THE PREVALENCE OF DIACHYLON POISONING.

This pernicious practice appears to have been growing since it was pointed out by Dr. Pope, of Leicester, in 1893. Dr. George Crooke showed its prevalence in Birmingham in 1898. Dr. Bell Taylor records a case in Nottingham in 1898. Dr. W. B. Ransom published notes of a number of cases in Nottingham in 1900. Dr. Wrangham records among others a case from Sheffield in 1901. Dr. W. Scott published in the *Sheffield Quarterly Medical Review* in 1901 notes of 27 cases occurring in the practice of the General Hospital, Nottingham.

I myself have seen 18 cases; these have presented most diverse symptoms, as shown in the following list:

(a) Previous diagnoses: Cerebral tumour, 1 case; intestinal obstruction, 3 cases; ruptured tubal pregnancy, 1 case; anaemia with gastritis, 1 case; renal calculus, 1 case.

(b) Most prominent features of other cases: Optic neuritis, 2 cases, one ended in atrophy with absolute blindness, the other completely recovered; acute mania, 2 cases, one commenced with a series of epileptiform convulsions—both recovered after about six months; severe abdominal pain and vomiting, 4 cases; severe anaemia with milder abdominal symptoms, 3 cases.

They all presented a severe anaemia with a characteristic faintly yellow complexion and the great majority a fine tremor of hands, lips and tongue.

In the great majority of these cases an examination of the gums decided the diagnosis with a finality from which there was no further appeal. There are, however, a certain number of cases in which the gums fail to give the sought-for proof. This arises from two causes.

1. The cause common to all lead poisoning, that scrupulous cleanliness of the gums prevents the formation of the sulphuretted hydrogen necessary to the formation and deposition of the lead sulphide. This occurs usually in the more youthful unmarried women.

2. I have seen one patient in whom the black punctate line was very faint and certainly not decisive (surely the term "blue line" is very misleading for it consists of a series of black dots absolutely distinct from the truly blue line of defective cleanliness), yet three weeks later—during which she had no opportunity of taking more pills—the line was beyond dispute. Mr. Chicken tells me that he has seen a case of diachylon poisoning in which the symptoms of lead poisoning preceded the appearance of the blue line by three weeks. It is therefore, as one might expect, a fact that the line may take some time in appearing and its absence may easily mislead one.

It is therefore of advantage to possess some other means for demonstrating the presence of lead.

II. THE MAGNESIUM WIRE DEPOSITION TEST.

In the *Lancet* of January 16th, 1899, Dr. Hill Abram published a modification of von Jaksch's test for lead in urine, which appeared almost as simple as testing for sugar; this I adopted some years ago, and was charmed with it, until I tried it with normal urine, with which it gave an identical result. Last year, under the kind tuition of Professor Kipping I endeavoured to obtain crystals of lead iodide from the yellow deposit obtained by this test from the urine of cases of severe plumbism and never once succeeded, yet I did obtain them from solutions of lead in water of 1 in 50,000 dilution as stated by Hill and Marsden.

The reasons for this apparent anomaly I believe to be as follows:

1. Dixon Mann states that the usual amount of lead excreted in the urine in cases of chronic lead poisoning is less than 1 milligram per diem, and assuming the quantity of urine to be 1 litre, lead is present in a dilution of less than 1 in 1,000,000. Mr. Trotman has confirmed this in two cases of chronic plumbism occurring in painters. The urines contained 0.032 and 0.006 milligram per litre respectively. It follows that a test having a limit of 1 in 50,000 will fail.

2. Recently in a case of diachylon poisoning Mr. Trotman has found in the urine 32 milligrams of lead per litre; this is equal to 1 in 26,000 solution, yet here he failed to obtain the magnesium wire test; and it was in similar cases that I failed to obtain the test.

In these cases some other explanation is needed. Now it is well known that lead is excreted in organic combination, and that on this account it fails to give the ordinary chemical tests; this no doubt is the true explanation of this failure.

III. THE ELECTROLYTIC TEST.

I have recently been fortunate in obtaining the aid of Mr. S. R. Trotman, our city analyst, who has not only confirmed my results with the magnesium wire test, but has tested a number of suspected urines by a modification of the electrolytic test which is both simple in manipulation and of extreme delicacy, and of which he gives the following account:

"It is unfortunate that the destruction of organic matter is essential, since the necessity for so doing often precludes the possibility of a rapid chemical diagnosis, such as could be carried out by a medical man unsupplied with laboratory apparatus. The need of rendering the combination of the lead less complex than it is in the albuminate of the urine is not, however, to be wondered at when we remember that delicate chemical, and particularly electro-chemical, reactions depend very largely upon the dissociation of a compound into its ions. Organic matter is commonly destroyed by means of hydrochloric acid and potassium chlorate, nitric acid, or other oxidizing mixtures. In the case of urine partial destruction only is required. The solution thus obtained is filtered and the lead separated by means of sulphuretted hydrogen or a double cell. Dixon Mann recommends that the liquid be placed in the inner portion of a