removed, leaving a vigorously granulating surface behind it. After the operation the attacks of pain still continued but they became less frequent and severe. There was also occasional pain in the left leg and foot and for a time the sole of the foot was sometimes congested and occasionally the foot was pallid. Pain was also complained of in the left arm and the fingers of both hands became bloodless now and then. By the end of January the wound had completely healed, though there was still some discharge coming from under the flap, and the patient was looking well and beginning to get about.

At about the middle of February, however, an apparent obstruction of the right femoral vein occurred. There was pain in the groin, the stump of the foot became swollen and purple, and there were paroxysms of severe pain in it. The whole leg was œdematous and the protruding bone in the stump became inflamed and bare. A fortnight later a similar attack took place on the left side and it was over a month before both legs had recovered and even then there were frequent pain and great tenderness in the stump of the right foot. The patient's health meanwhile improved greatly and by the middle of April the disease seemed to have entered upon another period of quiescence, though the foot still continued to give pain.

Though a description of the condition of the affected arteries cannot be given—fortunately for the patient—and though perhaps the possibility of slow-forming thrombus in atheromatous or sclerosed vessels cannot be quite excluded, this case has all the appearance of one of Friedländer's arteritis obliterans.

The heart was normal, the urine was free from albumin and sugar, and there was no evidence of atheroma or sclerosis in any of the accessible arteries. The obstruction could not have been caused by embolism, the lapse of time between the commencement of the symptoms and the occurrence of gangrene was too great. The arterial occlusion was evidently a gradual one. In this connexion the varying congestion and pallor of the feet are interesting, as they recall the symptoms in Raynaud's disease. This was most marked in the first attack; in the second attack the right foot was mostly congested and hot. The pains, from their severity and mode of occurrence, often led me to suspect neuritis, though there was perhaps not more wasting of the leg muscles than could be accounted for by disuse of the limbs and I did not notice any abnormalities of cutaneous sensation. The anginal attacks are also of interest when it is remembered that in specific cerebral arteritis—a typical obliterative arteritis—such attacks have been noticed and found to be due to affection of the coronary arteries. In this case, however, the attacks lasted for only a short time and did not recur, so they were probably of a purely neuralgic character. There were also pains in the arms, mostly the left arm, and the fingers were often dead and pale and the hands congested.

Friedländer[1] in his paper gives no clinical account of the disease; he confines himself to a description of its pathology and morbid anatomy. The morbid process begins by inflammatory cell growth in the inner coat which is thickened at the expense of the lumen of the artery. The other coats become affected and subsequently connective tissue formation sets in and the vessel is transformed into a fibrous cord. Complete obstruction is sometimes delayed by the continuance of the first, non-fibrous, stage in which the artery may not be completely blocked by the yet soft granular tissue, or occlusion may be hastened by the formation of thrombi in the partially obstructed vessel. The veins may also be affected. Friedländer says that obliterative arteritis is not so often primary as secondary to disease of the surrounding tissues.

Von Winiwarter[2] relates a case closely resembling that of my patient. The affected foot was amputated about four inches above the malleoli and he gives a most careful and detailed account of his examination of the parts that had been removed, pointing out that the morbid changes in the vessels were those previously described by Friedländer as arteritis obliterans. The veins were affected as well as the arteries and he also found that the posterior tibial nerve and its branches were involved and nearly doubled in thickness.

Dr. Prioleau in his Thèse (Paris, 1887) on "Rétrécissement Généralisé des Artères" does not seem to differentiate obliterative arteritis from arterio-sclerosis, but amongst his cases are some which resemble that of my patient and he describes morbid appearances similar to those recorded by Friedländer and von Winiwarter.

Dr. F. W. Mott has an excellent article on obliterative arteritis in vol. vi. of "Allbutt's System of Medicine," and both Dr. Prioleau and Dr. Mott give a full list of references, only one or two of which, however, I have had the opportunity of consulting.

St. Heliers, Jersey.

[1] Ueber Arteritis Obliterans, Centralblatt für die Medicinischen Wissenschaften, No. 4, 1876.

[2] Ueber eine eigenthümliche Form von Endarteritis und Endophlebitis mit Gangrän des Fusses, Archiv für Klinische Chirurgie, No. 1, Band xxiii., 1878.

A FURTHER NOTE ON THE THERAPEUTICS OF A 10 PER CENT. SOLUTION OF SODIUM CINNAMATE IN GLYCERINE INJECTED SUBCUTANEOUSLY.

BY LOVELL DRAGE, M.D. OXON.

IN the preliminary note published in THE LANCET of July 12th, 1902, p. 66, the groundwork of the treatment was briefly mentioned. Surprise has been expressed that a drug could profoundly alter the conditions of two diseases which are apparently so dissimilar in every respect as cancer and tuberculosis. However, there are points connected with them which appear to lead in the direction of the thought that, whatever dissimilarity there may be in their external manifestations, the conditions which precede the alterations in the structure of the cells which are affected are alike in type and that the general conditions of health in patients diseased either in the one or in the other way are equally alike in type. The difference in the alteration in structure is in detail, profound as that difference is. The difference in the general conditions of health is equally in detail, but not so fundamentally. In both diseases there are conditions intimately connected with the cells attacked which precede the conditions of actual disease and in both the results of the disease are manifested by the condition known as cachexia, varying in details even amongst those smitten by the taint of the two diseases. It is necessary, therefore, in the case of both diseases to consider very carefully the conditions affecting the cells themselves before they are attacked by the one or the other disease. Every cell, however low in the scale of organisation, has certain properties of its own, functional as well as structural. These are properties which may be designated as inherited properties in the case of some, acquired properties in the case of others. It is impossible to state that in cells affected by these diseases there is any evidence to show that both properties do not exist, and, indeed, it may be stated quite definitely that in the absence of inherited properties those acquired are only with difficulty obtained. If this be accepted there can be little difficulty in finding the reason for the many and great differences not only in the structural alterations noted in both diseases but also in the progress and clinical history of them. Varied as are the properties inherited by cells much more varied are their external conditions and surroundings. The variations which can be produced and perpetuated in many living cells are well known not only to the scientist but also to the stockbreeder and the gardener, although the latter know them in bulk, the former in sample. With the differentiation of the bacillus of tubercle and the demonstration of its connexion with the causation of the structural alterations in the cells which it attacked an important phase of knowledge was undoubtedly opened and so far as the improvement in the treatment of the disease goes there has resulted something. However, it never appeared to me that there was reality in that improvement. Under various treatments and under no treatment at all many patients become well—that is to say, that the masses of cells which had been attacked by the disease became cured in the manner adopted by nature.

The main lines upon which treatment has been generally based have been the improvement of the general condition of health by providing to the blood circulating in the vessels an abundant supply of oxygen and of nourishing food. It has been difficult in most cases, if not all, to say whether the drugs usually administered had any good effect, and still more difficult to find a satisfactory physiological reason for

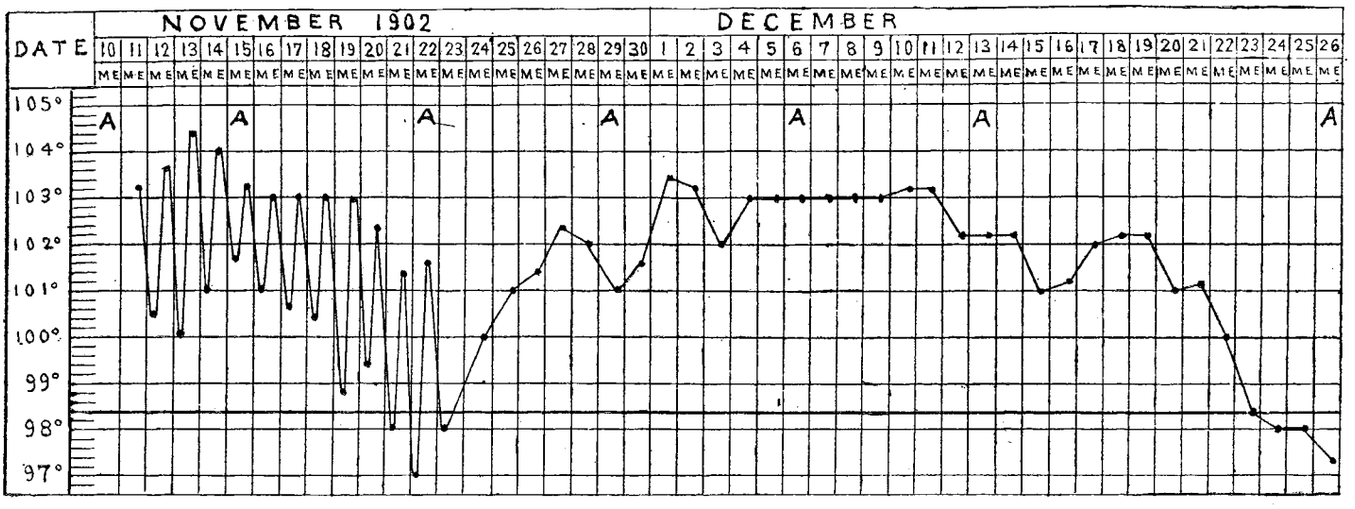
their administration. For many years past the speculation has never been present with me, Why should it be possible to control the bleeding resulting from fibroid tumours of the uterus by the continued internal administration of a strong decoction of cinnamon sticks, and, indeed, to reduce their bulk? It appeared probable that something was supplied through the circulation to the tumour which influenced its growth. Subsequently, on the administration of the oil in cases of tuberculous and cancerous affections, and especially the latter, it appeared as if some modification of the progress of these affections was achieved. This being the case, I thought it right to ascertain the effect of placing a patient under treatment before removing a breast affected by scirrhous cancer. I therefore treated the patient before operation with oil of cinnamon and continued the treatment for three months afterwards. As the breast was only removed in the spring of 1901 it is impossible to speak definitely, but there is one point which struck me very forcibly and that was the rapid improvement in the health of the patient. I do not recollect any patient whose breast was removed for cancer to improve so rapidly, or to remain in such good health as this patient preserves up to the present date. Not only is this so, but in the spring of last year the patient showed me an old sebaceous cyst in her back. This had all the appearance of an atrophic cancer. She told me that she had had it for years, but did not think of mentioning it to me when I removed her breast. I was very anxious that the sodium cinnamate should be injected forthwith, but she refused any sort of treatment. She now tells me that "the place has dried up with a sort of scab."

The inference which I draw, although it is obvious that others may, and probably will, be drawn, is that both the breast and the cyst were affected by cancer at or about the same time and that the oil of cinnamon treatment profoundly modified the progress of the growth of the cancerous cyst and has so far prevented any return of the cancer of the breast. It may here be remarked that the breast was only removed by the old-fashioned method and that the axilla was not opened up.

The period has now arrived when I can take up the thread of my discourse at the date of the publication of the paper which I wrote for THE LANCET last year. Since that date I have been actively using the glycerine solution of cinnamate of sodium. The accompanying chart will demonstrate the effect of the drug upon an attack of acute pulmonary tuberculosis in a young man, aged 28 years, engaged in a printing office. I was asked to undertake his case by a patient of mine who told me the distressing and pressing nature of the case. A young man, married, with a young child and a wife dependent upon him, was told that he was a bad case and unlikely to live. He was at the time an out-patient at the Brompton Hospital and was rapidly losing flesh. His illness began in the autumn whilst he was taking a holiday. On Oct. 10th he first saw a medical man who eventually told him that his right lung was affected and that he must attend the Brompton Hospital, a course which he adopted. Physical examination revealed comparatively little, expectoration was very small, there were no moist sounds to be heard, but breathing on exhalation at the right apex was prolonged slightly and more noisy than was normal. I agreed with the other medical opinion that the case was one of early and acute pulmonary tuberculosis. The chart speaks for itself; the morning temperature was not taken after Nov. 24th. Seven injections of the 10 per cent. solution of cinnamate of sodium were given at the dates marked upon the chart. The man went to his work in the office a week after the first injection and remained at work until the end of the treatment. He gradually put on flesh, improved in spirits, and although there was a considerable amount of cough and expectoration during the progress of the case there was always a continued improvement in health, and the patient at the present time has no cough, is as fat as he should be, and is without any symptoms except those of good health.

A second case to which I should like to draw attention is that of a young girl who had been troubled for some months with chronic diarrhœa. When she first came under observation she was emaciated and passing often more than 12 motions a day. On examination nothing could be detected in the abdomen or chest abnormal in character, but her appearance was that of a tuberculous patient. Various treatments were tried but nothing produced any diminution in the flux from the bowels. The glycerine solution has been injected at varying intervals into the flanks since then. Her bodily condition has steadily improved and the number of actions of the bowels has been diminished by one half. Nothing more can be said at present about the case, but it appears probable that a satisfactory issue will be obtained.

The result of experience of the use of the drug so far has led me in the direction of the belief that in early cases of pulmonary tuberculosis a successful issue may be predicted with confidence and that in all more advanced cases amelioration may be guaranteed with equal confidence. No treatment obviously can restore cells which are destroyed absolutely and if there are not sufficient cells remaining which are capable of performing their work the organ of which these cells are a part can either not perform its functions at all or only in part. So long as healthy cells remain in an organ sufficient to carry on its work, just so long has treatment by cinnamate of sodium or any other treatment a chance of preserving the life of the owner of the organ. The



Case of acute pulmonary tuberculosis in which cinnamate of sodium was injected. A, Injection of 30 minims. Morning temperatures were not taken after Nov. 24th.

case of early tuberculous laryngitis mentioned in my first communication is arrested and the patient is enjoying good health.

It is not my purpose to refer to other tuberculous cases at the present moment, but one of cancer of the tonsil, with a mass behind the angle of the jaw, presents points of interest. It is a case which has been seen by Mr. H. T. Butlin at St. Bartholomew's Hospital. The cinnamate solution has now been injected at varying intervals since the early autumn of 1902. Although the duration of the growth is not less than 12 months there is no difficulty now in swallowing, one small gland below the large mass has disappeared, and the action of the drug seems to have caused a fibrous incapsulation of the mass behind the jaw; the skin

is quite freely moveable over the mass. The patient feels little or no pain and generally appears to be in a condition unusually favourable in such a case, so far from the commencement of the disease. I am now using injection of doses as large as 60 minims of a 11 per cent. solution and with apparently quicker results. No symptoms of inconvenience are felt from the larger injection, but the pain caused is of somewhat longer duration. The amount of pain is not very great and this is judged because patients readily return for treatment.

Hatfield.

RESEARCHES ON HIBBERTIA VOLUBILIS.

BY JOHN REID, M.A., M.D., C.M. ABERD.

THE parts of the plant used in the following investigation were the fruit and the pistils which had been preserved by drying. They were obtained from Coraki and Manly Beach, two places in New South Wales. The plant was identified by the late Baron F. von Müller, who has also supplied the bibliography.[1]

Extraction with acetic acid and subsequent precipitation give the alkaloid dillenine; extraction of the residue with boiling alcohol takes up the oil; while by boiling the residue with liquor potassæ a solution of potassium dillenate is obtained, from which insoluble calcium or lead dillenate may be prepared and the acid eventually isolated. On neutralising the potassium salt with lime an acid foam may be skimmed off; it is the colouring matter which I propose to name "stephenic acid" after the late Rev. George Stephen of Fordyce, Banffshire. On precipitation with ammonia the acetic acid extract yields a brown-coloured neutral resin which is insoluble in ammonia, water, and chloroform, but dissolves in acids, forming a tasteless solution. Dillenine is soluble in chloroform which is used for isolating it; acicular crystals are deposited from the solution. The dillenate of dillenine is deposited from the chloroform solution in transparent laminæ more or less perfect. The acetic acid extract contains a little dillenic acid, shown by the sherry colour produced on the addition of ammonia. In spirituous solution dillenine lessens the colouring power of tincture of guaiacum on a cut surface of potato. When heated it becomes charred and burns with an odour of burning feathers. An aqueous solution of the dillenate or acetate precipitates mercuro-potassic iodide and iodurated iodide of potassium. Given internally in doses of less than one grain of the dried substance it causes a lowering of the blood pressure; the pupil also becomes dilated and remains so for a few hours, with disturbance of the power of accommodation.

The oil is thick, almost like palm oil, and possesses the sickly odour of the flower. When boiled with caustic potash it becomes whiter but is not saponified. By keeping it becomes resinous in appearance. It is soluble in benzene, in which menstruum dillenine and dillenic acid are insoluble. When swallowed it has an irritating effect on the tongue and gullet; it probably possesses aphrodisiac qualities.

Dillenic acid is very insoluble in water and when pure is a dark resin-like powder with an acid reaction. Its solution in water does not give a precipitate with perchloride of iron, gum, or gelatin. Stronger solutions of its salts with alkali metals show the following reactions:—1. Ferrous sulphate gives a colourless flaky precipitate in a solution which is greenish by transmitted light and dirty black by reflected light; the precipitate is soluble in dilute nitric acid, the solution being light sherry coloured by reflected and transmitted light. 2. Tincture of perchloride of iron gives similar reactions, except that a light sherry colour takes the place of the green colour; some flaky deposit (dillenic acid) appears to be undissolved in both cases on adding nitric acid. 3. Silver nitrate gives a dirty brown precipitate, subsiding very speedily, insoluble in dilute nitric acid but readily soluble in ammonia. 4. Silver stains on linen (recent) or on the fingers readily clear up on treatment with dillenate of soda or ammonia and free ammonia. 5. Dillenic acid dissolves sodium bicarbonate with effervescence; the salt is lighter in colour than the ammonium or potassium salts. Lead precipitates dillenic acid partially in a neutral solution or one containing a vegetable acid only and precipitates it completely in an alkaline solution. The precipitate formed with alum may be washed; it has faint astringent properties. Lime water precipitates it completely if in excess or in presence of an alkali and acetic acid redissolves the precipitate. A potassium salt gives a precipitate (*a*) with acetic acid; the filtrate from (*a*) gives a further precipitate (*b*) with nitric acid, and the filtrate from (*b*) gives with alum a precipitate (*c*) which is much less bulky than that obtained with acetic acid. Dillenic acid seems to nullify guaiacum colouration of potato and gives no precipitate with the reagents for alkaloids. The aqueous solution of the acid or of an alkaline salt keeps well (antiseptic). It is very insoluble in rectified spirit and entirely so in chloroform. An earthworm placed in a very weak solution gave two or three convulsive tremors of its longitudinal muscles and died, presenting a flattened appearance before and after death. Possibly the substance may be valuable as a germicide. In the human subject given internally in doses of less than one grain of the dried substance it causes slight griping, nausea at the throat, and salivation, with black motions (liver stimulation). There is no irritant effect and the taste is if anything pleasant and sweetish. Lime water is a speedy antidote. Dillenate of zinc may be used as a dressing.

Stephenic acid, like carminic acid, is insoluble in water. When washed it sinks as a granular precipitate and yields with ammonia stephenate of ammonium having the colour of carminate of ammonium. The ammonium salt stains nuclei a beautiful rose colour which will not wash out like carmine and may be mounted in dammar; glycerine dissolves it so slightly that specimens stained with it may be mounted in this medium. Stephenic acid after drying is more difficult to dissolve than when it is freshly prepared. The ash of the plant consists chiefly of alumina, silica, and iron.

Southfields, S.W.

[1] F. von Müller: Fragmenta Phytographiæ Australiæ, vol. vii., p. 125; vol. xi., p. 94. Bentham: Australian Flora, vol. i., p. 19. Ersch and Gruber: Encyklopädie. Thunberg: Transactions of the Linnæan Society, 1800. Rosenthal: Synopsis Plantarum Diaphoricarum, 1882.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

NOTE ON THE RETARDED PULSE WAVE IN AORTIC REGURGITATION.

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THE accompanying four tracings were taken with an instrument of precision, Mackenzie's cardiograph, attached to a Dudgeon's sphygmograph, and go to prove Sir William H. Broadbent's contention that the pulse in aortic regurgitation is more delayed the greater the regurgitation. The first tracing was from a normal heart and pulse to show the usual delay, the pulse being 80 to the minute. The second was from a case of slight aortic regurgitation, with very little hypertrophy and a good second sound in the neck, though the diastolic murmur in the chest was very loud. This showed no more delay than in the normal heart. The pulse-rate was 60. The third was from a case of very marked aortic regurgitation with a large collapsing artery. The apex beat was in the seventh space, four inches below and two inches outside the nipple; no second sound was audible in the neck. The diastolic murmur over the aortic and pulmonic areas was much less loud than in the last case. To the hand and in the tracing the pulse and heart appear to be synchronous, but the fourth tracing shows the delay between the carotid and the pulse and demonstrates that the pulse was a whole interval behind the heart, and the pulse-rate being 80 the delay works out at about 0·75 seconds. The delay between the apex beat and the carotid throb and between the carotid throb and the radial pulse were both appreciable to the finger. The interval between the carotid