that antipyrin would produce rise in temperature as well as fall. Antipyrin had very little action on the heart's muscle itself, and probably the action of this drug as well as antifebrin influenced the circulation rather through the nervous system than through a direct action on the heart-walls or vessel-walls.—Dr. ILLINGWORTH (Accrington) thought that antipyretics such as antipyrin acted by preventing the formation of fibrin. This was proved by the cyanosis induced by the drugs and by the reduction of oxy-hæmoglobin. These drugs ought, therefore, never to be used in diseases associated with diminution of fibrin; for example, typhoid and all germ diseases. It was only safe to give them in cases of pyrexia due to catarrhal causes. Dr. MacAlister, one of the chief authorities on pyrexia, thought that "the muscles were the chief furnaces of fever in health and disease." Dr. Illingworth thought he was not warranted in coming to such a conclusion, because there were not control experiments of such a nature as to indicate the effects of capillary circulation on rise of temperature. Corpuscular friction in health and blood-stasis in disease were, however, reasonable causes of thermogenesis. Again, Dr. MacAlister's experiments were purely physiological. Blood-stasis took no part in the conclusion, whilst all inflammatory processes were essentially associated with that process. Stasis caused tension (and in many cases pain); tension excited the vasomotor nerves both peripherally and centrally, and the result of both combined was increased resistance and increased *vis à tergo*. On the principle of "conservation of energy," increased friction in the circulatory cycle increased thermogenesis. The results of treatment were corroborative of such a view. In a case of pneumonia, salicylate of soda, alone or combined with carbonate of ammonia, liquefied the blood; and aconite or digitalis in five-minim doses depressed the action of the heart. By the double effect of liquefaction of blood and depressant effect on the heart there was rapid resolution of the pneumonia and a fall of temperature, frequently in twelve or sixteen hours, to the normal. His own experience with these drugs confirmed the observations in reference to their occasional production of collapse and dangerous symptoms.—Dr. WILBERFORCE SMITH said that the action of disinfectants in diseases caused, or probably caused, by micro-organisms was of great interest. He deprecated the use of carbolic acid or other powerful substances, which, to destroy micro-organisms in the blood or deep tissues, must go near to destroying the blood and tissues themselves. A more hopeful prospect was afforded by specific disinfectants for specific infectious diseases. The well-established use of mercury in syphilis and of quinine in malarious fever furnished the best instances. Mercury and syphilis in like manner naturally acted on corresponding tissues, skin, mucous membrane, bone.—Dr. KIRK (Glasgow) could not agree with Professor Leech in regarding carbolic acid as an antipyretic which was dangerous in doses sufficiently large to be effectual. He had found that in cases of pneumonia, typhoid fever, and general febrile conditions, with a temperature of 103° or 104°, it might be given with absolute safety in doses of 4 grains every two hours, until the temperature fell to 100° or 101°. In these cases, when the temperature was reduced below 102° by the drug, he invariably found that the general *bien-être* and comfort of the patient were much improved, and, as he believed, his chances of recovery much enhanced. He did not consider it necessary to reduce the temperature further, and perhaps the same doses would not then be safe, as there was probably a tolerance of antipyretic remedies in pyrexia. He believed that an exaggerated idea of the poisonous power of carbolic acid prevailed amongst the profession.—Dr. SIDNEY MARTIN was interested in the observation of Professor Leech that antipyrin in some cases produced fever instead of reducing it, because he had found, in some experiments on the action of the active principle (a globulin) of the jequirity, that in pigeons a large dose caused simply a great depression of temperature, while with a small dose the temperature sometimes rose one or two degrees before falling. With regard to the analgesic action of antipyrin, Dr. Martin had found the drug of great service in relieving the pain of aneurysm; but, owing to the large amount of liquid required to be given hypodermically locally, ecchymosis, abscess, or scarring might result, unless the liquid were gently rubbed away after injection.—Dr. ARCHIBALD MACDONALD (Liverpool) said that, on first learning anything of the germ theory in 1879, he had caught at the principle of antiseptic treatment of the zymotic diseases, and, after administering carbolic acid internally in 1880 for scarlet fever and whooping-cough, he had indicated his views in a short article in the *Edinburgh Medical Journal* of September, 1881. Then, and now, he held

(1) that antiseptics was the rational principle of treating all germ diseases; (2) that it was our duty to discover the antiseptic substance which was most antagonistic to the micro-organism of each disease; (3) that though the human organism could not be sterilised, appropriate antiseptics might lower the vitality of the disease germ, and prevent poisoning of the organism by the germs' excrement. Prevention by sterilisation of the body in the incubation stage of infection was difficult, but antiseptics given previous to the reception of cocci might be made prophylactic. Dr. Macdonald was experimenting as to measles in the case of his two children, doing an evening fumigation of their bedrooms with sulphurous acid, administering benzoate of ammonia, and causing them to wear when indoors a small bag containing absorbent cotton wool, on which terebene was dropped at intervals. He thought that the truth could be arrived at regarding antiseptics given internally if it were resolved to give a drug—say carbolic acid or benzoate of ammonia in scarlet fever—and all the members of the Association agreed to administer the drug for one year, and carefully tabulate their results, from which general deductions could be obtained. We wanted to be able to say: "This antiseptic will (prevent or) cure this disease." Dr. Macdonald referred to other antiseptics—eucalyptus, iodine, and menthol. He had given antipyrin in scarlet fever, typhoid, migraine, facial neuralgia, acute gastric catarrh, membranous dysmenorrhœa, and in a case of septicæmia, after a successful operation for ruptured intra-ligamentous gestation, the chart of which he exhibited; and he thought antipyrin to be one of the most valuable drugs in the *materia medica*.

CASE OF PERNICIOUS ANÆMIA SUCCESSFULLY TREATED WITH ARSENIC.*

By JOHN STRACHAN, M.D.,
Dollar, N.B.

J. C., aged 64, height 5 feet 11 inches, normal weight 13 stone. His parents had always been healthy, and came of a long-lived stock. His mother died at the age of 54 from the effects of severe carbuncle, and his father lived to the age of 71. His family consisted of one boy and two girls, but the boy died at the age of 13; both girls are alive and healthy. During the summer months he resides at his country seat in Perthshire, spends the winter in Edinburgh, and frequently travels on the Continent in spring. He is very regular in his habits, and has always been a temperate man, and with a tendency to too close application to business matters. He is of a rather phlegmatic temperament. With the exception of hay fever, to which he has been subject for about thirty years, and which sometimes took the form of bowel irritation with loose stools, he has enjoyed very good health up to the year 1877. In the summer of that year he had a rather severe attack of bowel irritation with loose stools.

This state of things continued, more or less, for the period of about two years, and reduced him very much, his weight at the end of that time being only 11 stone 7 pounds. For this he was treated chiefly with astringents. In 1879 he had apparently quite recovered.

For the next six years he enjoyed capital health, and increased in weight from 11 stone 7 pounds up to 14 stone 6 pounds. He expresses himself as never having felt better than during the summer of 1885. This was a particularly cold summer, and owing to that or to some other reason he had none of his usual hay fever. In the month of October, however, he was the subject of a severe attack of diarrhœa. Since then he has always had more or less looseness of the bowels.

In May, 1886, he went to Tunbridge Wells, and remained there until the end of June. He was there treated with iron, given, as he understood, as a tonic for the bowels, there being no mention made of anæmia. He received no benefit from this treatment, which rather tended to increase the bowel irritation. He, while in London, consulted Sir Andrew Clark, who ascribed his condition to irritation of the mucous membrane of the alimentary canal, and put him on a rigid diet with a tonic containing strychnine. He continued under this treatment during the summer, but with little or no benefit.

* Read in the Section of Medicine at the Annual Meeting of the British Medical Association held at Glasgow, August, 1888.

During the winter he was in Edinburgh, and was treated with various drugs—stringents, opiates, bismuth, and pepsine, and, latterly, with Bland's pills and other preparations of iron. His bowels, notwithstanding, remained loose, and gradually he became weaker, appearing markedly pale and anæmic. He had difficulty now in walking about, and was troubled with palpitation on the slightest exertion.

On June 3rd, 1887, I saw him in Edinburgh in consultation with Dr. Peddie and Dr. P. H. Watson, preparatory to his coming under my care at his country residence. His appearance was greatly changed since I saw him last, being much thinner, very pale, and evidently suffering from great bodily languor. We together made a careful examination of the various organs, but could detect no distinct variation from the normal. The face, lips, and gums were abnormally pale, tongue slightly coated with fur and flabby, and there was some oedema of the feet and ankles. The faces passed that morning were light-coloured and of a porridgy consistence, containing a good deal of gas, which gave them a frothy appearance. Urine merely darker than usual but not bilious. He complained of no pain, but only of great weakness. He was taking a mixed diet, with a fair proportion of animal food. For some time after his coming to the country I continued with the same line of treatment, but instead of improving he became daily weaker and more anæmic.

At first his pulse when at rest kept steadily at 84, but rising at once to over 100 on his assuming the upright position. It afterwards went up to 90 to 100 when at rest, and increased above this on the least exertion. He could not lift his arms without a painful effort, and when sitting up supported his head on his hands. He had also great weakness in the loins and thighs. The temperature was normal. The evacuations continued frequent and loose, and, as a rule, more or less pale and frothy. He was out of doors part of every day, the weather being fine, but was quite unable to walk about, on one occasion almost fainting on coming in.

At the request of his friends I now called in Professor Gairdner, and we saw him together on July 14th of last year. Like the rest of us, Dr. Gairdner could detect no organic disease, but diagnosed the case as one of pernicious anæmia. By his advice I now put Mr. C. on arsenic. I at first gave him arsenious acid parvules, but afterwards liq. arsenicalis in two-minim doses three times a day. I also sent some of his blood to Professor McKendrick for examination, and received from him the following report:

"The specimen of blood in the capillary tube presents several features of curious interest: 1. There are several forms of corpuscles: *a*, red corpuscles of the usual form and size; *b*, blood corpuscles globular in shape and slightly larger than normal; *c*, numerous red corpuscles of irregular form (change of form probably due to drying); *d*, a considerable number of small bright refractive bodies like oil globules and similar in appearance to those figured by Eichhorst as occurring in pernicious anæmia; *e*, not a single colourless corpuscle can be found. 2. The number of corpuscles is decidedly less than in normal blood."

I myself examined the blood, and was much struck with the remarkable condition of the red corpuscles.

A few days after the commencement of this treatment Mr. C. had a slight attack of congestion of the right lung, with rusty-coloured sputa, and temperature of 102°. As showing the extremely weak condition to which the patient had been reduced, it is noteworthy that this comparatively slight illness, lasting only a few days, was sufficient to bring him to the very point of death. The affection itself ran a very short, favourable course, but vitality was so low that this slight additional drain on it caused a state of coma lasting for about twenty hours, with Cheyne-Stokes breathing and almost imperceptible pulse, during which we all thought he was about to breathe his last.

This seemed the turning point in the case. The coma gradually passed off, but it was another twenty-four hours before he fully recovered consciousness. For a long time after this his weakness was extreme. He was troubled with a hacking cough and with frequent fits of dyspnoea, which distressed him greatly. The oedema of the feet and legs increased, extending above the knees, and the scrotum became considerably distended with fluid; but almost from the time of commencing the arsenic the state of the bowels and stomach improved; the evacuations were reduced to five in twenty-four hours and assumed a firm consistence, although still more pale than natural; the tongue cleaned and the appetite improved.

On August 15th I have the following note of the case: "Decided improvement during the last fortnight. Digestion and appetite

greatly improved, having only one motion in twenty-four hours, of good form and consistence, such as he has not had for many months. Takes a good deal of nourishment with some relish, and is distinctly putting on flesh. The oedema of feet and legs was greatly less for a time, but has increased within the last day or two. The pulse, however, has been greatly increasing in rapidity, till it is now never under 100, sometimes as high as 120, and weak. Distressing attacks of dyspnoea. Examined the blood, and find some improvement; corpuscles more numerous; a greater proportion well formed, and a more distinct attempt to form rouleaux; there are still many misshapen and fragmentary in appearance. Stopped arsenic for a time, owing to toxic symptoms."

From this time improvement set in and went on steadily. In addition to the arsenic, of which he took Fowler's solution, $\frac{iii}$ three times a day, I gave him, as required, digitalin parvules, euonymin, a diuretic with iron and nitrous ether along with gin, and for a time small doses of strychnine, and kept him on a light diet of milk and farinaceous food.

On August 27th the pulse was down to 95, and he was able to sit up for some time every day.

On September 5th he was able to go down stairs and spend a little time in the conservatory. His pulse was then 84 when sitting up, but only 72 when lying quietly in bed. The heart increased in power every day.

On September 13th the pulse was only 78 immediately after he had finished dressing, and on the 15th 76 five minutes after he had walked upstairs. The oedema, however, rather increased than diminished, extending up the legs to the back of the thighs and across the loins. The scrotum was considerably distended.

On September 29th I was able to write the following to Professor Gairdner: "You will be gratified to learn that the improvement in Mr. C.'s health still continues. He is now looking like his former self; he walks with a firm step and erect head, and his pulse is scarcely accelerated even on walking up stairs (it keeps steadily at 75). The blood is wonderfully improved, indeed I can scarcely distinguish it now from healthy blood, unless that the individual corpuscles are rather fewer in number. The individual discs seem quite healthy; I enclose some for examination by Dr. McKendrick."

The following is Dr. McKendrick's report on the state of the blood on October 3rd, 1887: "As compared with normal human blood: *a*. The red corpuscles vary more in size, many being smaller than normal. *b*. The biconcavity is not so distinctly marked. *c*. The small highly refractive globules formerly mentioned are still present. *d*. Colourless corpuscles are now apparently present in larger quantity than in normal blood. Many of the colourless corpuscles are very large, as much as one-thousandth of an inch in diameter."

On October 1st there was a slight return of the bowel irritation with loose frothy stools and some vomiting; this however passed off next day, and he was then able to be down stairs.

On October 3rd he walked for an hour in the garden.

On November 8th I wrote the following letter to Professor Gairdner:

"You will be pleased to learn that Mr. C. is progressing steadily and most satisfactorily; his strength is greatly increased, he can walk up and down stairs with ease, and outside for an hour at a time. He gets out every day that the weather is at all fit, and walks in the garden and grounds; his appetite and digestion are very good, and the bowels act almost quite regularly once a day. The oedema of the leg is almost gone, only a little swelling round the ankles remaining. The pulse keeps very steadily at about 70. He has had no attacks of dyspnoea for a long time; he sleeps well and is very cheerful. He is taking nothing in the way of medicine except three drops of liq. arsenicalis three times a day with occasional intervals of a week, and sometimes a little euonymin. I send you some of the blood, which I hope will show as marked an improvement. So far as I can judge it does not now greatly differ microscopically from healthy blood. I shall be glad to learn Dr. McKendrick's opinion."

The following is Dr. Snodgrass's report on the blood (November 11th, 1887:

"It has nearly a normal appearance, allowing for some changes due to partial coagulation. The coloured corpuscles do not vary much in size as before, the number of the smaller cells being diminished. The highly refractile globules previously mentioned are scarcely to be seen in any part of the field, and so far as can be judged the number of colourless corpuscles and their size seem to be about normal."

After this Mr. C. gained steadily in strength, and before he left the country, about the end of December, was able to walk two or three miles at a stretch, his pulse being generally about 70.

He spent the winter in Edinburgh, and about a month of spring in North Wales. He is now at his residence in Perthshire, and pretty well out of the doctor's hands. He has lately spent the greater part of three days in the Glasgow exhibition, which I take to be a pretty severe trial of strength. He still continues to take the liq. arsenicalis for every alternate month.

Dr. AFFLECK thought there was now sufficient clinical evidence to justify an alteration in the nomenclature of this disease. Many of the cases, having all the characteristics of pernicious anæmia, recovering completely under treatment by arsenic, in conjunction with a suitable diet. Dr. Affleck had repeatedly had cases of this disease under treatment in the Royal Infirmary, Edinburgh, where hæmacytometric observation has shown corpuscles reduced considerably below 1,000,000 per cubic millimetre completely recover under treatment by arsenic and iron.—Dr. M. A. BOYD said that, in a great many cases of chronic dilatation of the stomach, supervening on chronic gastric catarrh and without organic disease, a condition of anæmia and exhaustion supervenes, which was often mistaken for pernicious anæmia. The history of this case would closely correspond. The persistence of chronic gastro-enteric derangement for so many years would produce all the symptoms enumerated, more especially as the patient improved ultimately with arsenic.

ON THE VALUE OF ELECTROLYSIS IN ANGIOMA AND GOITRE.¹

By JOHN DUNCAN, LL.D., M.A., F.R.C.S.E., etc.,

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I THINK it may be interesting to put on record a few of the outstanding cases of angioma which have come under my observation during the last year or two, with the view of illustrating and defining the varieties in which electrolysis is the best treatment at our command. I shall select the cases because they present individual peculiarities which fit them for this purpose, and because they are in themselves unusual. Nævi, or the congenital forms of capillary angioma, of course present themselves in large numbers. I choose three.

CASE I.—A remarkable example of the cutaneous variety was brought under my notice by my colleague, Mr. Miller, not because it was possible to treat it, but because he knew I was interested in the subject; and I cite it simply as typical of a class for which as yet we have no reliable means of cure. In this child the whole of one thigh as high as the buttocks and other extensive areas of the body were of a most delicate pink tint, which, indeed, it would have been difficult to recognise as abnormal but for the sharpish edge where it met the normal skin, and the possibility of demonstrating the dilated vessels by gently stretching the skin. Besides this, there were dotted irregularly over the body a multitude of black specks about the size of a pin's head, more and less, which looked like minute extravasations or pigmentations, but which careful examination showed to consist of closely-packed vessels. I have never seen the cutaneous nævus or port-wine stains at once so delicate in colour and so extensive, nor have I seen so extraordinary a number and blackness of these tiny vascular dots.

CASE II.—A case of nævus interesting for its size in a puny child three months old was brought to the infirmary in May, 1887. The tumour, gigantic when compared with the patient, was the size and shape of a medium-sized Jaffa orange. It was situated behind the ear. The whole surface was of a bluish pink colour not uncommon. It was exceedingly soft, and by pressure the blood could be so entirely forced out of it that it became completely wrinkled and flaccid. It was also remarkably slow in refilling. An absolute cure in every respect, not a mark or trace being left, was attained by three electrolytic operations, one of them performed in my absence by Dr. Hodsdon.

CASE III.—On Dr. Taylor's recommendation a nævus was put under my care, which presented this striking peculiarity, that a portion of it occurred in bone. It occupied the anterior and

chiefly the outer part of the foot in a child about eight months old. It did not involve the skin in the slightest degree, but reached completely through and through the foot from dorsum to sole. By pressure four metatarsal bones could be distinguished, of normal size and shape, although all except the first were imbedded in the growth. But the fourth metacarpal bone was very greatly enlarged, and, on introducing the needles into it, they plainly entered first the vascular tissue, then passed through a thin osseous and cartilaginous shell, next the nævoid medullary cavity of large size, and lastly the opposite circumference of the bone. As the child has advanced in age this toe has not developed with the same rapidity as the others, and is now somewhat recessed.

There was at first considerable difficulty in diagnosis. The total absence of any affection of the skin, except as to one or two dilated veins which any tumour might cause, and the expansion of the metatarsal bone, were the sources of this difficulty. But the compressibility, extent, and uniform consistence of the portion external to the bone formed the grounds for believing the tumour to be a nævus and not a sarcoma, an opinion which has been confirmed by the lapse of two years, and the behaviour under treatment.

It is plain that such a nævus was amenable to no other method of treatment than amputation or electrolysis. To leave it alone while it was rapidly growing would have been unjustifiable, if there were any possibility of safely arresting its progress. The whole anterior part of the foot was so involved as to make excision impossible. The injection of coagulants is to be looked upon as acting in a somewhat similar manner to electrolysis, but is always less manageable, more dangerous, and not so effective. Amputation was not to be thought of in a condition not dangerous to life, and in which a cure natural or artificial was still possible. In short, the case was one of those in which the advantages of electrolysis stand out in the clearest manner, because it was really the only available method, was free from danger, and with time and perseverance was absolutely certain of success.

The applications were somewhat difficult and uncertain because the child lived two hundred miles away, but six operations have had this effect: that the tumour has become greatly consolidated, is shrivelled, and is steadily diminishing in size.

CASE IV.—From several examples of extensive cavernous angioma I select one which was sent to me by Mr. Lawson Tait. As I have elsewhere pointed out, these forms are generally adult varieties, a few commencing late but most being extensions and alterations of congenital examples. In this young lady the tumour occupied the bend of the elbow and extended over a large part of the anterior and inner aspect of the upper arm. It had been treated in various ways, and injection of perchloride of iron had caused much sloughing and great danger from septic poisoning. It showed extremely well the large caverns which exist in these cases. Some could be felt with the needles to be as large as walnuts, and one or two had a covering including skin and venous wall not thicker than a piece of parchment. The operations were performed at intervals varying from six weeks to three months. The difficulty consisted in producing sufficient effect on the walls of the angiomatous caverns without involving the skin in destruction. Now, however, after working at it for more than a year and a half I have the satisfaction, thanks to the indomitable perseverance of the patient, of knowing that it is at length cured. Here again no other method of treatment was possible. The question of amputation had indeed been seriously entertained in despair of success by other remedies.

The other cases which I wish to record are examples of pulsatile angiomata.

CASE V.—The first is the case of a medical student, sent to me by Dr. Frew, of Kilmarnock. It belongs to a common class, the ordinary pulsatile nævus. A considerable portion of the side of the neck and face was occupied by a lightly tinted port-wine stain, but of late an extraordinarily rapid development of a pulsating swelling had occurred in the ear, so that the auricle resembled a huge pear, and the pulsations could be seen at any distance. One operation sufficed to cure the disease.

CASE VI.—Cirsoid aneurysm is comparatively a rare disease. I had the satisfaction of seeing a short time ago a girl, aged 19, in whom an exceedingly severe form had been entirely cured by electrolysis in 1886. She was sent to me by Dr. John Moir, of St. Andrews. The tumour chiefly affected the left temporal artery, but extended to the occipital on the same side and the temporal on the other, forming an irregularly rounded tumour more than three inches in diameter. Two operations consolidated the greater

¹ Read in the Section of Surgery at the Annual Meeting of the British Medical Association, held in Glasgow, August, 1888.