Result.—Rapid improvement and cessation of pain and heat in joint. A year after was walking about comfortably, but owing to very bad family history was directed to continue to wear instrument, which is no trouble.

Fig. 11.—Modified Thomas's splint for acute hip-joint disease. Attached above by shoulder straps, leaving chest perfectly free.

Fig. 11.

Fig. 12.—Dr. Judson's (New York) ischiatic crutch for hip disease, used by him in all stages of the disease. I have found it very useful after the acute stage has subsided.

Fig. 12.

This apparatus my friend Dr. Virgil P. Gibney (New York) intended to show at the meeting, but, unfortunately, it did not arrive in time.

Fig. 13.—For caries of the spine. Plaster-of-Paris, leather, or gutta percha back splint moulded to the back while the patient is recumbent in a prone position, with the legs at an angle of 45° with the straight line of the body (so that the lumbar part of the spine does not bend in too much).

Fig. 13.

This splint is applied upon the principles of Mr. E. J. Chance's instrument. The latter is the more perfect appliance, because it enables the surgeon to regulate more exactly the bearing of its different parts in accordance with the progress of the case; but for general purposes the splint here depicted is applicable, and by it the spine is held firmer than by any jacket.

Fig. 14 represents a plaster-of-Paris spine support for caries leaving the chest perfectly free, strengthened in back by metal bands.

Fig. 14.

THE ETIOLOGY AND CLASSIFICATION OF THE ANÆMIA OF PUBERTY.¹

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A LARGE number of girls suffer during puberty from a condition of ill-health characterised by a very constant train of symptoms, and to which the names anæmia and chlorosis are applied. Although the disease is so common, its symptoms so plain, and the treatment, as a rule, so successful, the etiology is by no means well established, various theories being put forth by different writers.

Trousseau² considered it a neurosis, the blood changes being secondary. Niemeyer³ appears to consider it as a result of premature sexual activity. He writes: "According to my observation, obstinate chlorosis attacks all young girls without exception in whom the menses have appeared in the twelfth or thirteenth year, before the development of the breasts and pubes." Mitchell Bruce⁴ says the origin of the disease lies in a peculiar condition of the blood and blood-vessels, which is believed to be congenital and perhaps hereditary. Aitken⁵ considers chlorosis as one of the "functional diseases of the female organs of generation in the unimpregnated state." Sir Andrew Clark⁶ considers "fæculent retention and its consequences" as the cause. Sée⁷ looks upon the inability of the organism to meet the demands made upon it by the simultaneous advent of menstruation and of rapid growth of the tissues as the cause.

A great many predisposing and exciting causes have been described by various authors; most of these seem to be not so much causes as merely coincident with the time of life at which the disease begins, but, generally speaking, all things are causes which lessen metabolism and the power of the system to meet the demands made upon it, such, for instance, as want of exercise, improper food, and vitiated air, and the variety of the disease caused will depend greatly upon the force and direction of these causes.

The distribution of the disease bears this out. It is not confined to any class, but is more often met with in large towns than in the country, and is much more common amongst girls who sit at their work than amongst others. When it does occur amongst servants, defective drainage is often an exciting cause. In Dublin the disease is very common; yet in Huddersfield, where the great

¹ Read before the Medical Section of the Royal Academy of Medicine in Ireland, March 9th, 1888.

² *Clinical Medicine*, vol. v, p. 101. 1872.

³ *Textbook of Practical Medicine*, vol. ii, sec. iii, chap. i.

⁴ Quain's *Dictionary of Medicine*, art. Anæmia.

⁵ Quoted by Sir Andrew Clark in a paper read before the Medical Society of London, November 14th, 1887.

⁶ Medical Society of London, November 14th, 1887.

⁷ Quoted by Sir Andrew Clark.

majority of the girls work from an early age in mills, it does not seem to be common, as, on looking over the notes of more than 600 cases treated there consecutively, I find only three examples of the disease, and one of these girls is specially noted as having a "sitting job" in a mill. The chief differences between the girls in Yorkshire towns and those in Dublin are that the former are better fed and have more exercise, both at their work and after it.

But, although these causes are generally met with, sometimes they are absent, and the disease occurs in girls of good physique, living in country air, warmly clad, and well fed.

In Sir Andrew Clark's paper⁸ the graphic description of the patients only dealt with one variety of the disease—that generally termed chlorosis; but other well-marked varieties of the anaemia of puberty are met with. I would venture to propose the following classification:—

1. Fat anaemia, where there is a well-marked deposit of adipose tissue.
2. Anaemia of overgrowth, where there has been well-marked general increase of growth without much deposit of fat.
3. Anaemia of general malnutrition.

The first and second and the second and third may overlap, but never the first and third. In the first variety the symptoms of anaemia generally follow the deposit of fat in the tissues; in the second they follow the rapid growth; in the third they generally follow the appearance of the menses. The second and third (those in which there is no deposit of fat) are liable to be complicated by tubercular disease.

In spite of the great weight of Sir Andrew Clark's experience I cannot look upon constipation as even an important cause of this anaemia. Constipation and anaemia are often associated, but very often the constipation is not greater than would be expected from the general sluggishness of the functions, and is similar in significance to the copious pale urine, of low specific gravity and deficient in urates, so generally associated with this anaemia. That the constipation is accompanied not only by torpidity, but also by loss of power, is shown by the failure of belladonna and nuxvomica to relieve it.

Another argument against constipation being the cause of the disease is that cure often follows the use of iron in the form of Griffith's mixture or Bland's pills, without any purgatives being administered.

Habitual constipation is a common complaint, and as long as the bowels are evacuated regularly, uncomfortable symptoms seldom arise, no matter what the interval between the motions. There seems no reason why constipation should at one age and in one sex cause this characteristic train of symptoms, and produce none of these symptoms at other times.

In some curious cases the constipation is persistent through life, but is not accompanied by any definite symptoms except at puberty and the menopause, at both which periods there is palpitation with shortness of breath on exertion. In one case, at present under observation, there has been obstinate constipation, as a rule not more than one motion in nine days; the patient is now 40, and it is only quite lately that the palpitation and shortness of breath have appeared.

With regard to the occurrence of the menses, my experience is very different from that of Niemeyer.⁹ Early development and not premature menstruation seems the rule. Often the anaemiasets in without any appearance of the menses, but in many of the cases there has been a slight appearance for from one to three or four months, and then either a total cessation or an occasional slight appearance for a month or two, and then several months without any.

Generally speaking, I have found that in the anaemia of general malnutrition the menses may be absent, scanty, or, in rare cases, normal. In the anaemia of overgrowth there is an attempt at establishment of menses without development of the breasts, etc. The beginning of fatty anaemia is coincident with the development of the breasts, etc.

In the fatty anaemia there is certainly an hereditary acquired causation. It is very common to find several sisters affected. In one family I have noted four, in another three, and in several two so affected. In these cases I have often found that the mother has been married early in life, and I have learned to look upon this as an important factor. In one family of good means, and living in the country, the mother was eighteen years of age at the birth of

her first child. She has had five sons and three daughters; all the sons have been very strong, but the daughters, although when young, strong, and of healthy colour, have all passed through well-marked fatty anaemia. In another case the mother never suffered from anaemia; her first child, a daughter, was born when she was only seventeen; the child is now rapidly getting stout, has no appearance of the menses, and is, in fact, passing into fatty anaemia.

Another very interesting point in this variety of anaemia is, that if any strong call in a particular direction is made upon the system, it will be able to meet it; thus, there is generally marked shortness of breath and palpitation on going upstairs, and but little whilst walking not too rapidly on level ground, yet domestic servants so anaemic as hardly to be able to walk on level ground, will sometimes be able to carry heavy weights upstairs. This I have never observed in the other forms of anaemia.

A most important contribution to the etiology of the disease has been made by Beneké,¹⁰ who has shown that the annual increase in the heart and blood-vessels in girls up to puberty is 8 per cent., per annum, whilst during the establishment of menstruation it is 80 to 100 per cent., so that if puberty is established in a single year, an extra growth of from 70 to 90 per cent. weight, in addition to ordinary growth, is entailed, and that at the end of puberty the lungs have arrived at the fullest development, and the excretion of carbonic acid gas has reached its highest. There is no such rapid change in the male.

Professor Bowditch¹¹ says that, up to 11 or 12, boys are, on the average, taller and heavier than girls; for the next two or three years girls have the advantage, whilst after 14 or 15 boys again excel in strength and height.

It is probable that the rapid development of the female is to be found in sexual selection. Men generally choose wives younger than themselves, and so women who are early sexually mature are most likely to be married and have offspring. In time this ought to cause a rapid maturity, and the general tendency would be emphasised in the offspring of mothers who were married young.

The parts affected in this rapid development are the various tissues derived from the mesoderm. The white cells and blood corpuscles, the heart and blood-vessels, the reproductive organs, and the supporting and connecting tissues are chiefly affected. During puberty the mesoderm is largely called upon by the rapid growth of the organs concerned in generation. If the system is unable to meet the demands made upon it, anaemia results. If badly under-nourished, the system is almost certain to fail to meet the extra demands, and the anaemia of general malnutrition is established. If, at the time the rapid growth of the organs of circulation and reproduction is set up, there is active growth of the bones, muscles, and other tissues, the system may be overtaxed by the further demand, and the anaemia of overgrowth gradually appear. In a third class of cases the mesodermal energy is misdirected, and instead of the demand being supplied, an excessive amount of reserve tissue (possibly resulting in part from deficient oxidation) is formed, and fat anaemia develops.

That there is not only an accumulation of fat, but deficient growth and a fat substitution, is shown by the aorta of small calibre and the unequal thickness and fatty metamorphosis of the intima, which are so well-marked as to have led to the idea that the cause of the disease is a congenital condition of the blood and blood-vessels.¹¹

With regard to prognosis and treatment, I would add only a few words. In the variety of anaemia associated with deposit of fat there is sufficient, but misapplied, vitality, and cure may be looked for. The treatment is twofold, specific and symptomatic. Iron may fairly be called a specific; introduced in quantities far exceeding the ordinary needs of the system, it does good, and often, without any assistance, cures. Dr. Oswald Schmiedeberg¹² says: "The possibility cannot be denied that under conditions otherwise favourable and necessary to the cure, the formation of red blood corpuscles may be forced, even by an increase of the iron absorbed, which, though in itself minute, is kept up a considerable time, because of a long-continued extra supply of the metal."

It seems probable that the iron acts by modifying the mesodermal growth and checking the excessive formation of a reserve

¹⁰ *Der Ueber das Volumen des Herzens und die Weite der Arteria in den Verschiedenen Lebensalteten*, 1879.

¹¹ *The Growth of Children*, 1877.

¹² *Cf. Dr. Mitchell Bruce, loc. cit.*

¹³ *Elements of Pharmacology*, 1887, p. 182.

⁸ *Loc. cit.*

⁹ *Loc. cit.*

material. Arsenic and the mineral acids also do good, but I believe not so rapidly.

As bearing on the specific action, I may mention that the syrup of the iodide of iron has seemed to me to act much more rapidly and effectively than the syrups of the phosphates and of the hypophosphites.

The form in which the iron is given must vary with the necessities of the case. As a rule I prefer four or five grains of the iron and aloes pill of the *B.P.* each night and morning. In this combination I have never found iron disagree. If there is a catarrhal condition of the mucous membrane of the stomach, I use a mixture containing sulphate of magnesia and sulphuric acid, either adding sulphate of iron to it or ordering the myrrh and iron pill of the *B.P.* In some forms of dyspepsia the sulphate and carbonate of magnesia with aromatic spirits of ammonia in a bitter infusion act well in conjunction with the iron and myrrh pills. Very rapid improvement follows the use of the solution of the perchloride of iron, *B.P.*, but some people cannot take it; I find however that it disagrees with comparatively few since I have prescribed it (on the suggestion of my friend Dr. Cameron, of Huddersfield) with an equal quantity of spirits of nitrous ether.

Hygienic treatment is also important. Fresh air, good food (especially meat), and moderate exercise are useful, but over-exertion is hurtful, and tends to prolong the anæmia, or even to render it permanent.

In the anæmia from overgrowth the prognosis is generally good, but the possibility of tubercular disease must not be overlooked. Fresh air, nourishment (especially milk), and comparative rest are all important. Iron has not seemed to me to be so necessary; when given it is generally best in the form of the syrups of the iodide of iron and of the phosphates. If purgatives are required, I prefer the saline ones and avoid aloes.

In the anæmia of general malnutrition the prognosis is bad; the excessive demand comes upon a system but badly able to fulfil its ordinary duties, and permanent debility generally results. In such cases, country air, perfect rest, and plenty of milk and other easily assimilated food, with cod-liver oil, is what is required, and medicine is of secondary importance. I have found most benefit from the sulphates of iron, quinine, and magnesia, in combination with hydrobromic acid.

ON THE EXCISION AND SCRAPING OF CARBUNCLE.

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THERE are few procedures in practical surgery that better deserve recommendation than the local extirpation of carbuncle, of which the pain and tenderness are thereby ended, and the state of gangrene, always virulent and sometimes inveterately spreading, replaced by simple inflammation in a healing sore.

If the carbuncle be small enough, or seen early enough, an abortive treatment may sometimes be practicable by syringing through it an effective antiseptic liquid; but we seldom get such a good chance of doing this in carbuncle as in boil. In my own case I have several times arrested a boil in its early commencement, when little more than a pustule in a hair follicle, by injecting strong carbolic or sublimate solution a few times, at short intervals, with a hypodermic syringe. But the manipulation necessary for this in even a small carbuncle is at least as painful and prolonged as the excision of the virulent centre (or centres), and not appreciably more saving of tissue. When an anæsthetic is given, the question of pain, as of time, is unimportant; but there are cases of small carbuncle, especially facial, in which excision there and then, without assistance, is very convenient to the surgeon and readily borne by the patient. The disease is almost always acutely tender, if not constantly painful, while constitutional disturbance is sometimes great and increasing. The effect of extirpation is immediate relief to the former ill, and a gradual but sure end to the latter when not too late. I concur with the support given to this important practice by Mr. Herbert Page and Mr. Edmund Owen in the *JOURNAL* of March 24th, and with the tribute there paid to Mr. Teale's excellent paper on "Scraping," adding, in this brief reference to my cases, some details that usefully supplement those accounts. I prefer, however, to consider together erasion and excision, as both may be required in different parts of the

same carbuncle, while other carbuncles require the one or the other according to the softness or hardness of their affected tissues.

CASE I.—A servant girl, aged 19, was sent by Dr. Grimes to the Liverpool Royal Infirmary on the evening of September 4th, 1885, suffering from an acute brawny inflammation on the left side of her chin, of four days' duration. As there was a question of malignant pustule, I was summoned, and went to her at once. Under chloroform an incision was made, and the nodule inspected within. The tissues in the centre were grey and purple, and the thing was decided to be carbuncle. A conical piece was excised, pure carbolic acid put into the wound, with a sublimate dressing laid on. The inflammation melted rapidly away day by day, and the girl was well in a fortnight. There was, I believe, no anxiety about her constitutional state from the first, but I have no note of the details.

Here the best practicable form of immediate local extirpation seemed to be excision with a sharp knife, on account of the density of the tissues. The virulent centre was about the size of a pea, and yet the collateral swelling was as big as half a walnut.

CASE II.—A night-soil carter, aged 23, had a pimple on his neck on May 24th, 1886. This he picked, but was none the worse next day, when, however, he took too much drink, and, the day following, his neck began to swell, and his head to ache intensely. On the 28th he was sent by his medical man to the Liverpool Royal Infirmary, with the left side of his neck in a swollen, red, angry state, very like in appearance to the illustration of malignant pustule given in the *JOURNAL* by Mr. Morrant Baker on June 14th, 1884. His temperature was 104°, and the disease was at first supposed to be a mild form of malignant pustule. Excision of the centre, dirty-grey and purplish, with some surrounding skin, was performed by me without anæsthetic shortly after his admission. Pure carbolic acid was put in, and sublimate dressings applied. His temperature rose to 105° that evening, but fell to 100° during the night. It was taken every two hours for four days, and found to rise after mid-day and fall after midnight. The second day after admission it did not reach higher than 102°, but the day following it again became 104°, after which it kept below 100°, before eventually subsiding to normal. This case was on clinical grounds regarded as a mild form of malignant pustule; the local appearances, absence of pus, and constitutional state favouring the idea. But neither the juice of the excised fragment nor the patient's blood or urine showed bacilli under the microscope, though there were abundant micrococci found in the urine and juice of the wound. The case is therefore considered to be a small carbuncle, or aggravated boil, with unusually severe symptoms, presumed to be due to ptomaine poisoning.

CASE III.—Another carbuncle of the chin, right side, in a woman aged 22, who came to me on January 15th, 1887, eight days after its appearance. In local characters it was like Case I, and getting worse every day. But the temperature was only 99.8°, and the pulse 72, which I thought augured well for the patient. I excised the centre, without anæsthetic or assistance, in my consulting room, applied carbolic acid inside and a sublimate dressing outside, with the same good effect.

A few years ago I read an account by, I think, a Parisian surgeon, of the excision and antiseptic after-treatment of ordinary carbuncle, and determined to adopt it at the first opportunity. This did not occur until April 26th, 1886, when (CASE IV) a man aged 43, came under my care in hospital. He was not ill, and the carbuncle was not severe, though moderately large. But it was, as usual, tender and painful, situated at the back of the neck, and he was likely to be benefited by its removal. I therefore commenced to excise it at once, under chloroform, through a crucial incision, dissecting back such part of the remaining skin as seemed not too far injured. But I soon found that the sharp spoon more easily served the purpose, most of the carbuncular tissue being soft and pulpy. The bleeding was certainly abundant, but was controlled with hot water and the pressure of sponges. The next day he expressed himself very pleased, feeling that "a load had been removed from him," in the loss of all discomfort. Sublimate dressings and eucalyptus ointment were used, and he was well in a fortnight.

CASE V was that of a man, aged 50, who came under my care on January 19th, 1888, with a large carbuncle on the nape of the neck of some ten or twelve days' standing. He was not ill nor in distress, but he readily agreed to its removal. Here I began to erase, but soon found that excision had to be done with knife or scissors in some portions that were hard and brawny, and entirely