

"open method" as "slap-dash," and the drop-bottle and mask as an unreliable substitute for some method such as that used by Snow and Junker. With either of these, or by Duroy's æsthesiometer, an exact quantity of the anæsthetic can be given and varied according to the requirements of the patient.

GENERAL SURGERY.

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I.—GENERAL METHODS.

On the picric acid treatment of burns.—Some amount of doubt is being cast upon the value of this method in spite of the favourable reports which have appeared from time to time. Thus, whilst on the one hand Miles (*Scottish Med. and Surg. Journ.*, Nov., 1897) recommends it warmly, maintaining that it is soothing, simple, free from danger, and aseptic, Latouche (*Rev. de Chirurg.*, Feb., 1898, p. 159) reports two cases of intoxication by its means, both of which recovered, but only after grave symptoms of vomiting and diarrhoea. Several members of the Soc. de Chirurgie related their experiences, stating that it constantly caused severe pain, and one case of death from collapse after the appearance of toxic symptoms was reported; whilst others maintained that the rapidity of healing was not appreciably increased. The possible explanation of these divergent views lies in the character of the burns which were treated. It is only suited to the first two degrees, *i.e.* to cases where the whole thickness of the integument is not destroyed. For superficial scorchs without vesication it acts admirably; in treating burns of the second degree, the bullæ should always be opened and the cuticle removed, and then the picric dressing applied: in the latter class of case the action is a little less certain, and special idiosyncrasies of the patient may render it extremely painful. Picric acid should always be avoided in very extensive burns.

The cause of death after extensive superficial burns is the subject of a long and valuable report by Char. R. Bardeen, M.D. (*Johns Hopkins Hospital Reports*, vol. vii., No. 3). The conclusions at which he arrives are that there is not sufficient evidence for us to accept the old theories as to its causation, *viz.* that it is due to vaso-motor changes, or to extensive thrombosis, or to the influence of the burning on the internal organs. From clinical and experimental evidence he concludes that acute toxæmia is the real and ultimate cause, although he admits that the nature of the toxic bodies and

their mode of action and origin are at present mere matters of conjecture. In connection with this theory an article by Tommasoli (*Centrabl. f. innere Medic.*, June 25, 1898) is worthy of note, in which he recommends the intravenous injection of artificial serum (*i.e.* of normal salt solution) to prevent death in such cases. The first patient upon whom this method was tried died, but a second was saved after having received injections of from 8 to 16 oz. of serum daily for a number of days. Experiments on animals also confirmed this idea: two out of six rabbits whose hind-quarters had been severely burned recovered after the use of injections, whilst four control animals without injections died. This fact is well worthy of notice; we have already, in the "Year-Book" for 1897 (p. 179), pointed out the value of such treatment in conditions of septic toxæmia in other parts of the body, and there can be doubt that similar good results would follow the use of intravenous injections in severe burns.

The treatment of inoperable sarcoma by Coley's fluid still continues, and reports of cases dealt with in this way appear from time to time in the journals. The most important of these is a communication from Coley himself to the American Medical Association at Denver (published in full in the *Journ. of the Amer. Med. Assoc.*, Aug. 20 and 27, 1898, and abstracted in *Med. Record*, Aug. 27). Coley has made no difference in the method of preparation of the fluid, and still considers that the addition of the micrococcus prodigiosus is desirable. Care must be taken that no living virus is present in the fluid (and it is always advisable to test every sample carefully before use), whilst the most stringent precautions as to the asepsis of the skin at the point of injection, and of the syringe employed, must be observed. It will be remembered that a case of pyæmia was published by M. Sheild in the beginning of last year as an outcome of this proceeding. Sheild has now published another case, in which he has utilised it with temporary advantage (*Brit. Med. Journ.*, July 23, 1898): "On each occasion the surface of the skin was carefully purified, the needle was sterilised, and the puncture made by it at once covered with iodoform and collodion. Pure carbolic acid was kept in the barrel of the syringe between the intervals of use. . . . The syringe was filled by plunging the needle through a septum of fine gutta-percha tissue stretched over the bottle which contained it. The puncture thus made was at once closed by wax. . . . During the intervals between use it was kept in a cool chamber." Coley points out that the doses should be very minute to start with, and gradually increased until reaction is obtained. The amount employed in any case varies with the virulence of the

particular sample, and with the site of injection. If the subcutaneous tissue of the trunk is employed, larger doses are called for than if injected near to or into the substance of a vascular tumour. At the same time he recommends that it is desirable to employ it locally. The method of action cannot, however, be that of a local escharotic, since some tumours have disappeared when it was merely injected into the back. Its influence must be exerted directly upon the cells of the tumour, causing them to undergo fatty degeneration and absorption. If the tumour is a firm one, of the spindle-celled type, it will diminish and disappear without sloughing, whereas a soft round-celled tumour will very probably break down and slough away, necessitating the adoption of careful antiseptic measures. If no improvement is shown in three weeks, the treatment should be discontinued. The chief dangers arise from the use of too large a dose, possibly causing collapse, and from the dangers of sepsis, unless sufficient precautions are taken. Coming now to results, Coley summarises them as follows:—140 cases have been treated by him, and of these the great majority have been proved to be sarcoma by actual microscopic examination of fragments removed; eight cases remained well over three years; well from one to three years, nine cases; well from six months to one year, four cases; recurred after having once disappeared, four cases—two of whom died, whilst two are still living in good health after further treatment. He has also been able to collect twenty-six cases treated by other surgeons, in which the tumour completely disappeared, and nine where it disappeared temporarily. Of these, three were published by Mansell Moullin in England (*Lancet*, Feb. 5, 1898).

One other point in this connection remains to be noted, viz. that Coley and other surgeons recommend that after operation for sarcoma, where there seems any likelihood of recurrence, it would be well to put the patient through a course of treatment for a short period, as a prophylactic measure. Of course it is difficult, or even impossible, to say whether such is of any value, since absence of recurrence might be due to completeness of operation, but there is very little risk associated with the proceeding if due precautions are taken, and it may be advantageous.

The treatment of tubercular glands.—One detail which, though old, is evidently not sufficiently recognised, has had attention again called to it, viz. that tubercular glands are due to some local cause which, if looked for, can usually be found, and which should always be treated prior to touching the glands. Thus when the glands in the neck are affected, one usually finds that there has been, or that there is present, either an enlargement of

the tonsils, adenoids, eczema of the ears or nostrils, chronic otorrhœa, or some such condition. This opinion is expressed by Miller, of Edinburgh (*Scot. Med. and Surg. Journ.*, Dec., 1897), as follows: "(1) Glandular enlargement has always a cause which should be sought for and removed if possible. (2) If the cause be not removed, the enlargement will persist, and such persistence (the open door) may give occasion to tuberculosis. (3) Persistent enlargement after removal of all discoverable causes generally means tubercular infection or a pretubercular condition; therefore all persistently enlarged glands should be excised." Bilton Pollard (*Clin. Journ.*, Nov. 24, 1897) says much the same thing, and one's own experience fully confirms the accuracy of these opinions.

The treatment of tetanus.—There is the usual crop of contradictory reports as to the value and efficacy of treatment by the subcutaneous injection of antitoxin. This mixture of praise and condemnation was well illustrated at the meeting of the Royal Academy of Medicine in Ireland (*Dublin Journ. of Med. Sci.*, Feb. 1, 1898). Lund (*Boston Med. and Surg. Journ.*, Aug. 18, 1898) discusses the whole subject, and some of his conclusions are as follows: (1) That although the statistics of the antitoxin treatment up to the present time apparently show a diminution in the mortality, they may be legitimately criticised as on the whole insufficient in number, in definiteness of reports, and as probably not including all fatal cases treated. (2) The more we study them, the less evidence do we find that the anti-toxin treatment and not the mild course of the disease was responsible for the favourable results. There is no satisfactory evidence that harm has resulted from the injections. (3) There is a distinct probability that in the great majority of the total number of cases treated, the dose of antitoxin, especially the all-important initial dose, has been too small to have any possible effect upon the disease. (4) The chief means whereby we may hope to render this plan of treatment more efficacious consists in securing a stronger product, and, on the part of those who employ it, the administration of a sufficiently large initial dose, given at the earliest possible moment. The serum should be injected directly into the blood stream.

As to statistics, which (be it remembered) must necessarily be very unreliable, the latest that have been published are as follows: Lund (*op. cit.*) has collected 167 with 54 deaths, *i.e.* with a mortality of 39.5 per cent., against the estimated mortality of 60 per cent. without antitoxin treatment. Weischer (*Münch. med. Woch.*, Nov. 16, 1897) collected 98 cases treated with

serum, of which 57 recovered, giving a death-rate of 41.8 per cent. He also criticises the variability in the strength of the antitoxin sent out.

The most important step in connection with this question arises from some new experimental work published by Roux and Borrel (*Annales de l'Institut Pasteur*, April, 1898), which suggests a novel treatment for tetanus, and may have wide and far-reaching results in its applicability to other diseases. It has been long recognised that the effect of the antitoxin is preventive rather than curative. Its action in man as a curative agent is unsatisfactory and uncertain, and the explanation now suggested of this fact is that the cells of the central nervous system have a selective affinity for the toxin which they store up in their substance. The antitoxin is only introduced under the skin and circulates in the blood, and hence is unable to reach and act upon the toxin which unites chemically with the cell protoplasm. Metchnikoff has already proved the diffusion of the antitoxin through the cerebro-spinal axis by means of leucocytes, and therefore Roux and Borrel propose to introduce the antitoxin into the substance of the brain so that it may act upon the uninfected centres as an immunising agent, and thus, if the medullary centres are not already affected, it is hoped that the patient's life may be saved long enough to enable the toxic substances acting on the lower centres to work off their effects and disappear. If the medullary centres are involved in the trouble there is practically no hope of staying the course of the disease, at any rate by sero-therapeutic means.

This method of treatment has already been extended to the human subject. Three cases have been reported, of which the outcome was satisfactory in two; in the third a fatal result ensued (*Presse Méd.*, June 18; *Gaz. des Hôpitaux*, June 21; and *Méd. Moderne*, Aug. 10, 1898). The proceeding is an eminently simple one. A curved incision is made so as to expose at the centre of the flap a point 8 cm. above the external orbital process. A trephine 8 mm. in diameter is utilised; the dura mater is incised transversely, and the surface of the brain exposed, corresponding to the base of the second frontal convolution. A hypodermic needle is introduced into the brain to a depth of about 5 or 6 cm. and the injection slowly made. In the first case Roux injected into each side of the brain $1\frac{1}{2}$ to 2 c.c. of dried antitoxin dissolved in 5 c.c. of sterilised water. In the successful cases the result was that the tetanic seizures ceased to involve any new regions, although the contractions in those already affected continued. Gradually these passed off, and in the first

case, which was of a very grave nature, the tetanus was practically cured in 22 days, although the patient's illness lasted for some weeks longer. In the fatal case some degeneration of the brain was found corresponding to the site of the injection. Further observations of this method of treatment will be followed with the greatest interest.

II.—SURGERY OF BONES AND JOINTS.

The treatment of fractures.—Vitrac (*Presse Méd.*, Feb. 23, 1898) contributes a useful article, well illustrated, dealing with the *ambulatory treatment* of fractures of the leg, particularly emphasising the value of a movable stirrup incorporated in the plaster case. The accompanying figure (Fig. 1) is a reproduction of the double splint and stirrup which he advises. It consists of two wooden limbs to pass down each side of the leg. Their length necessarily varies, but they are usually about 40 cm. long, 4 cm. broad, and 4 mm. thick; they must be made of light, though strong wood, and the outer surface is best left unpolished, so as to allow the plaster to adhere to it more closely. The upper ends have metal plates attached, which can be moulded to the shape of the tibial tuberosities. The stirrup is made of metal, preferably aluminium, so as to reduce the weight of the apparatus, and works up and down the wooden side-pieces, in which slots are cut for the insertion of screws or bolts. The centre of the sole-piece is cut out so as to reduce the weight, and the under-surface is coated with leather. The stirrup is applied loosely, whilst the plaster casing is being put on, and, of course, the plaster extends under the foot between it and the stirrup. The limb is first encased in plaster in the usual way, a firm and strong extension pass-

Fig. 1.—Splint with movable stirrup for ambulatory treatment of fractures of the leg (Vitrac).

ing under the sole. The apparatus is applied to the outer side of this, and the upper end of it securely incorporated in the plaster case. The stirrup is then fixed by the bolts or screws at a suitable height, and when all is firmly consolidated the patient is able to walk or even run about. Thus, a child, twelve years old, was able to play about on the fifth day after a fracture of the leg in its middle third. As to fractures of the femur, Vitrac states that a similar apparatus can be employed, only longer and stronger, and with the

malleable metal supports at the upper end much larger, so that they can be moulded to the ischio-trochanteric region. He considers, however, that the cases of fracture of the thigh which can be advisably treated in this way are few in number, owing to the weight of the apparatus, which causes it to slip down and become displaced, thus permitting movement of the fragments.

The utility of *massage* in fractures is being more and more recognised, although some of the exaggerated statements which appeared a few years back are being discredited. One of the most sensible papers dealing with this subject is by Buscarlet (*Rev. Méd. de la Suisse Romande*, Dec. 20, 1897), who points out that to depend entirely on massage in fractures of the long bones is to court failure. His conclusions concur entirely with one's own opinions, viz. that in such cases a combination of the old plan of keeping the limb in splints with suitable massage and passive movement of joints, commenced at as early a date as is thought safe, will give the best results. There is no question that the bad results attending fractures of the long bones is not to be attributed entirely to the defective position in which the ends are allowed to unite, but rather to the impairment of movement of neighbouring joints, due to prolonged immobility, and to adhesions and fibroid changes occurring in muscles and their sheaths, due to the imperfect absorption and subsequent organisation of blood clot. Massage is an excellent means of assisting in the absorption of extravasations, and, of course, will prevent in a large measure the atrophy of the immobilised muscles. Hence the plan that ought to be followed is to apply light splints which can be easily removed and replaced, and then as soon as the callus is beginning to become firm, say, in ten or twelve days, or possibly earlier in some instances, the splints should be removed daily, and *séances* of massage, gradually increasing in length, should be instituted. Naturally this practice is more adapted to private cases than to hospital work, unless our students are regularly instructed in the methods of massage. Bennett (*Lancet*, Feb. 5, 1898) strongly confirms these statements, and follows the same practice.

When, however, we come to treat fractures involving, or in the neighbourhood of, joints, it is often found unnecessary to use any immobilising apparatus, beyond, perhaps, a sling for the upper extremity, and rest in bed for a week or two in the lower. *Colles's fracture* is one in which these principles ought to be followed very carefully; only too frequently do we see cases in which the deformity persists, and in which the movements of the wrist are subsequently much hampered, owing to adhesions of tendons and in the joint. Corson, of Savannah, Ga. (*Med. Record*, Jan. 15,