piratory division, but also diminishing the irritability of the whole centre to afferent impulses. This symptom may persist from a few days to some months after the poison is discontinued.

AIKINS'S HOOP-IRON SPLINT IN FRACTURES OF THE HUMERUS.

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On consulting standard works on the treatment of fractures, I find no reference to any splint in the least like the "hoop-iron" splint which Dr. W. T. Aikins and many of his pupils have used for nearly twenty years. This splint has been used with such satisfaction by its inventor and by large numbers of surgeons throughout Canada who have had the advantage of sitting at the feet of Dr. Aikins during his admirable lectures on fractures from the chair of surgery in the University of Toronto, that I, with many others of his old pupils, have never ceased to regret that its designer failed to find time in his busy life to place a description of the splint on record. And now that our much-respected professor has laid aside as well his industrious scalpel as his always reluctant pen, and has retired from active duty to crown "a youth of labour with an age of ease," I gladly take upon myself the task which his diffidence, not less than the arduous duties of his calling, prevented him from performing in his earlier years.

Fig. 1

The material of the "Aikins's splint," as it is usually designated, is the ordinary flexible band or hoop iron, such as may be procured at any ironmonger's or blacksmith's shop. For infants and very young children a band 1 inch wide is amply strong; for adults a width of from $1\frac{1}{4}$ to 2 inches will usually be found to be of sufficient strength. The thickness and strength of the material are usually in proportion to the width. As a rule, the material can be worked by hand, bending it over the edge of a table, or around a pillar or bedpost, but it will be found convenient to have a strong pair of pliers, or a couple of "monkey-wrenches," as well as a file, hammer, etc.

With the entire approval of Dr. Aikins, the author has introduced a material modification of the splint as regards the

part applied to the shoulder, and as the description of the application of the modified form fully includes that of the original, while the converse is not the case, it is proposed to describe the former.

The material, having been selected with due regard to the muscularity of the patient, is now bent and twisted in such a way that an arch is formed over the top of the shoulder. The anterior limb of this arch reaches downwards over the front of the chest in a direction approximately towards the umbilicus, and may be 8 to 12 inches in length. The posterior limb forms the vertical part of the splint, and passes down the back part of the shoulder and arm to a point about an inch below the point of the bent elbow. At this level the iron is again bent somewhat obliquely so as to pass under the forearm in a direction towards the mid-line of the body. The splint, in fact, almost forms a triangle, the sides of which, however, do not lie in the same plane. (Fig. 2.) It is not an object to make the arch over the shoulder to fit at all accurately; on the contrary, the bend should be made in such generous proportions that the arch will stand almost entirely free from the shoulder, otherwise its edges might press painfully upon the bony prominences.

Then it is a distinctive feature of the splint that the distance from the shoulder arch to the bend under the elbow should be such that when the arch is fixed in position by strapping, considerable extension may be made on the muscles of the arm by drawing the forearm down to the horizontal limb of the splint below the elbow.

The splint may be padded to any desired extent by wrapping it with a roller of sheet cotton. (For the sake of sim-

Fig. 2.

plicity it is represented in the photographs without any padding.)

In applying the splint the patient should, if possible, be in a sitting posture, with the spine quite erect. If confined to bed he should be turned somewhat towards the sound side, or a firm pillow should be placed under the spine and sound shoulder. The splint is now placed in position, with the arch over the shoulder, and secured very firmly (but quite free) by one or two strips of rubber adhesive strapping about an inch and a half broad, and long enough to reach well down upon the front and back of the thorax. For the sake of additional security one or both straps may be given a turn round the top of the arch. Similar straps are made to embrace the anterior limb of the arch, and pass horizontally round the thorax.

A moulded splint for the upper surface of the forearm—raw hide, gutta-purcha, Gooch's, or pasteboard—should now be very carefully fitted and padded. The reason for so much care in preparing this is that here is the point of greatest pressure, as extension is made by strapping the forearm down to the horizontal limb of the splint. A moment's consideration will show that very effectual counter-extension is made by the elasticity of the skin to which the shoulder arch is strapped.

The broken humerus is now set, and while an assistant makes steady pressure on the arm, with the elbow bent to a right angle, palm up, and approximates the moulded splint to the iron one, the surgeon secures the position by a couple of broad strips of plaster. If necessary or desirable short coaptation splints may now be applied to any or all aspects of the limb, and secured by strapping or bandage to the vertical portion of the splint. These give a sense of security to the patient, but I have treated many fractures of the humerus satisfactorily with no more complicated apparatus than is shown in the figures.

In the case of multiple, compound, or complicated fractures, the fixation and extension afforded by this splint may be supplemented by plaster-of-paris, starch, or other fixed dressings, appropriately "trapped" to afford access to wounds, etc.

When the fracture is situated at or below the middle of the humerus, the simpler form of the original splint (Fig. 2), in which the shoulder portion merely projects towards the base of the neck, while the vertical portion occupies the outer aspect of the arm, will be found to answer every requirement. When, however, the lesion is in any part of the humerus above the middle, and firm fixation of the shoulder-joint becomes increasingly important, the additional security afforded by the arch (Fig. 1) will be found to be of great advantage.

With the possible—though doubtful—exception of avulsion of the greater tuberosity, I believe there is no fracture of the humerus—shaft, upper or lower extremity—which cannot be treated satisfactorily by means of this splint. And without expecting that all surgeons will agree with me, I do not hesitate to express my preference for this over all other splints for any fracture of the humerus. Its unquestionable power of making extension enables us to enlist by its use the moulding power of the extended muscles, and to appreciate the value of this one need only consider for a moment the excellent fit of the tense deltoid as a shoulder cap, and the support afforded by the bulky muscles, which almost surround the shaft of the bone. In fractures of the condyles, or in T-shaped fractures into the elbow-joint, the control which may be obtained by the use of this splint of the bones of the forearm, and through them of the fragments, constitutes one of the most valuable applications of the splint. In dislocations forwards of the radius also, the difficulty of overcoming the action of the biceps in reproducing the dislocation is met by its judicious use.

ADVANTAGES CLAIMED FOR THE SPLINT.

It is the only splint described (so far as I know) which furnishes in itself the means of making effectual extension of the muscles of the arm.

It is cool, light, and affords ready means of examining the parts during healing, with the minimum of disturbance.

It permits the direct application of evaporating lotions or the cold coil where indicated.

In compound fractures ready access may be obtained to the wounds, and if the iron of the splint be brushed over with melted paraffin it can be readily rendered aseptic, and lotions and discharges leave it unaffected.

BEATTY v. CULLINGWORTH.—The plaintiff in this case having presented a petition for leave to prosecute an appeal before the House of Lords *in forma pauperis*, the matter was referred, according to the usual course, to the Appeal Committee, and was duly considered at a sitting of the Committee held on Thursday, May 27th. The petition was dismissed. The result of this decision is that if the plaintiff persists in her intention of bringing her case before the House of Lords she will have to conform to the ordinary rules, one of which involves the payment of a substantial deposit (£200) as a preliminary proceeding.

INTUBATION AND ANTITOXIN.

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IN conversation with Dr. O'Dwyer last October, he expressed the opinion that the early use of antitoxin in laryngeal diphtheria would entirely remove the necessity for intubation. My experience of the past winter does not lead me to accept this extreme view, but it goes to prove that the period of intubation is materially reduced by the use of antitoxin.

In the General Hospital since last October I have intubated 12 cases of laryngeal diphtheria, and in addition 4 cases in the Hôtel Dieu and 2 in private houses, making 18 in all. There were no fatal cases in the hospital, and of the others 2 died. Neither of the fatal cases received any antitoxin. One began as bronchitis, and after four days developed laryngitis, with some membrane on the tonsils and pharynx. Intubation did not give much relief, and death followed twelve hours later. The other fatal case began as a tonsillar and pharyngeal diphtheria. No antitoxin was used, but the membrane disappeared about the sixth day. On the ninth day, when I first saw the case, laryngitis had developed with the secondary formation of membrane. Intubation relieved the dyspnoea, but death took place twelve hours later from cardiac paralysis.

The following table shows the duration of the illness before the use of antitoxin, the amount of antitoxin used and the number of injections, the period of intubation, and the frequency of reintubation:

Case.	Age.	Duration of Illness before Use of Antitoxin.	Antitoxin.		Period of Intubation.	Reintubation.
			No. of Injections.	Total Amount.		
1	Mths.	4 days	2	2,000 units	9 days	Twice.
2	7 0	1 day	2	1,000 "	30 hours	"
3	3 6	1 "	1	1,000 "	6 1/2 "	"
4	3 7	2 days	2	2,000 "	5 1/2 days	Once.
5	0 0	1 day	1	1,000 "	1 1/2 "	"
6	3 1	3 days	1	1,000 "	4 "	Once.
7	5 0	2 "	1	1,000 "	2 "	"
8	10 0	No antitoxin	—	—	3 1/2 "	"
9	3 3	2 days	1	1,000 "	4 "	"
10	3 6	No antitoxin	—	—	Death in 12 hours	"
11	5 0	1 day	3	2,500 "	3 days	Twice.
12	3 6	1 "	1	1,000 "	2 "	"
13	6 0	No antitoxin	—	—	2 "	"
14	4 0	"	—	—	Death in 12 hours	—
15	6 2	1 day	1	1,000 "	2 days	"
16	2 6	1 "	1	1,000 "	3 "	Once.
17	7 0	1/2 "	1	1,000 "	1 1/2 "	"
18	2 6	1 "	1	1,000 "	3 1/2 "	Once.

It will be noticed that, of the 4 cases in which no antitoxin was used, 2 recovered and 2 died. The average period of intubation in the 16 cases of recovery is three days. In 2 cases twelve hours elapsed between the injection of antitoxin and the operation. In all the others there was an interval of a few minutes only. All were fed by means of the catheter through the nose. This method I believe to be the best, as it ensures a sufficient quantity of nourishment without effort on the part of the patient, and without producing exhaustion from coughing. Usually after the second introduction of the catheter no resistance is offered. The other treatment consisted in the use of calomel, chiefly by sublimation. No local applications were made.

My experience in these cases leads me to consider it advisable to extubate after thirty-six or forty-eight hours. This is the time when, by the action of the antitoxin, the membrane is being thrown off. It may be unnecessary to reintubate. At any rate, it is usual to see a great deal of membrane coughed up immediately after the removal of the tube, and if dyspnoea returns and it must be replaced there is less coughing and less danger of plugging of the tube.