fully established. Nourishing food was allowed from the first, and, three days after the injury, ten minims of tincture of sesquichloride of iron and four grains of sesquicarbonate of ammonia were given in camphor mixture three times a-day. The ligatures separated, one on the thirteenth, the other on the fourteenth day after their application, and the boy recovered without an untoward symptom.

Original Communications.

ON DISEASES OF JOINTS.

By HOLMES COOTE, Esq., F.R.C.S., Assistant-Surgeon to St. Bartholomew's Hospital, and to the Royal Orthopædic Hospital, etc.

VIII.—FORCIBLE EXTENSION OF JOINTS.

1. *The Elbow-joint.* No joint has been more frequently subjected to treatment by forcible extension than that of the elbow. The smaller size of the articulation as contrasted with the knee; the readiness with which force could be applied, were circumstances too favourable for such a proceeding to be overlooked. The ultimate result has appeared to me to be nearly the same in all cases. The forearm may be flexed or extended to any angle, but the limb remains stiff: no free motion is restored. Hence the idea which was once entertained, that forcible extension might become, in some cases, the means of restoring the proper movements of the forearm after disease, proves to be fallacious.

Let me relate the *post mortem* appearances of some joints which have been the seat of acute and of chronic disease; and thus perhaps the explanation will be apparent why stiffness of the limb should remain. It is unnecessary to remark, that the treatment now under review is chiefly applied to cases of the latter kind; but the evidence afforded by both sets of morbid appearances will be interesting.

Lobstein relates the particulars of a case of ulceration of the articulating surfaces—protrusion of the head of the radius through an ulcerated opening of the skin. On the elbow of a man, aged 25, there were two large sores, one on the internal condyle, the other on the external condyle of the humerus. The ligaments were entirely destroyed, and the head of the radius protruded through the corresponding opening of the skin. The articulating surfaces were rough, the muscles partially destroyed and degenerated. The nerves had retained their normal structure, though thickened externally. (*Traité d'Anat. pathol.*, tom. ii, p. 309.)

The severity of the inflammation, often aggravated by want of proper treatment, may tend to abscess or mortification of the bone. Such a case is related by Meinel (*Ueben Knochen-tuberkeln*), who saw in a youth, aged 18, who had suffered from numerous ulcerations of the skull, ulcerations of the cartilages in the right elbow-joint, with a carious condition of the surfaces of the bones, and exposure of the cancellous structure. Between the condyles of the humerus, and imbedded in the substance of the bone, was a round cavity, containing a thick substance, like tubercle (inspissated pus?). A similar cavity was found in the sigmoid extremity of the ulna. The cavity for the head of the radius was completely destroyed. With this ulcerated condition of the extremities of the bones is sometimes combined a porous and spongy state of the osseous tissue (Museum of St. Bartholomew's Hospital, Ser. II, No. 30), or the development of osteophytes (Syme, *Treatise on the Excision of Diseased Joints*: 1831). Necrosis has been noticed and recorded in very many instances—1. At the lower end of the humerus, combined with anchylosis of the joint, by Michet (*Gaz. Méd. de Paris*, 1840, tom. viii). 2. In the upper extremity of the ulna, combined with partial anchylosis of the joint (Museum of Royal College of Surgeons, No. 3164). In the Museum of St. Bartholomew's Hospital (Ser. I, No. 209), there is a specimen shewing part of the spongy substance of the humerus in a state of necrosis, and lying loose in the medullary cavity: a long fistulous passage passes into the articular cavity, which is in great part deprived of its cartilage.

The history of diseases of the elbow-joint illustrates the fact that, in persons of strumous habit, bony anchylosis does not take place. The only apparent exception to this rule is when, after long continued local disease, the strumous taint seems to have worn itself out, in which case the processes of repair become the same as in individuals perfectly healthy.

In the Museum of the Royal College of Surgeons of Eng-

land there are two specimens of considerable interest; one (No. 3344) shewing osseous union (the forearm at a right angle), without any considerable alteration of form; the other (No. 3346) with considerable change and atrophy. The Museum of Anatomy in the University of Berlin (No. 2252) contains a specimen of anchylosis of both elbow-joints, from a man aged 50. In the right arm, the humerus and ulna are united at a very obtuse angle, both bones passing by fusion one into another, so that the trochlea is no longer visible. The upper part of the head of the radius is wanting. The bones are somewhat atrophied. In the left arm the same changes exist; the bones, however, being at a right angle. In all probability, the cause of the disease was rheumatism. In the Museum of St. Bartholomew's Hospital (Sec. I, Subs. B, No. 29) there is a specimen of similar origin, in which all the three bones are blended together at their articular extremities.

In chronic inflammation, the morbid changes and processes of repair are more generally important as regards the mode of treatment now in question.

Chronic rheumatic inflammation terminates often in changes such as the following specimen in the Museum of the Royal College of Surgeons, taken from a man aged 50. The articular surfaces of both joints, instead of being covered with cartilage, are smooth, hard, and in parts polished. On the margin are numerous knotty osteophytes of hard and compact tissue, but covered with glistening fibrous structures. The head of the radius is larger than natural, by the formation of new bone, and directed backwards; a great part of its anterior surface being flattened, corresponding to a similar flattened surface in the front of the outer condyle of the humerus.

Preparation No. 53 (Museum of St. Bartholomew's Hospital), Sec. III, Sub-sec. B, exhibits the limb in extreme flexion, the hand in extreme pronation. At the articular extremity of the humerus, the internal condyle is diminished in circumference, and pointed; the trochlea is nearly obliterated; part of the external condyle is hard and polished; knotty osseous growths surround the borders of the joint. The outer half of the greater sigmoid cavity is hard, polished, and superficially furrowed; the inner half is rough, as if ulcerated. The lesser sigmoid cavity is obliterated. Below it is a deep hollow for the head of the radius. The head of the radius, deprived of cartilage, is directed backwards from the shaft, and surrounded in greater part by osseous growths; its anterior surface, corresponding with the external condyle of the humerus, is hard and polished.

In the treatment of all cases of progressive disease affecting joints, rest is imperatively necessary. When the disease has subsided, voluntary movement will return, aided by passive exercise, provided no serious injury has occurred to the structure proper to the articulation. In cases of chronic rheumatic disease, when the articular cartilage has been removed, and the surfaces of the bone have acquired a polished ivory character, passive motion, assisted by counterirritants, may be the means of greatly improving the patient's condition. But forcible extension, however skilfully effected, seems but to give us the power of placing the limb into whatever position we require; the freedom of movement following the operation is lost as soon as the ruptured and torn tissues have had time for repair. The following case, related by Cruveilhier (*Traité d'Anat. pathol. générale*, tom. i, p. 465), is supposed to have been one of incomplete dislocation, brought on by ulceration of the articular surfaces. The articular extremities of the humerus, radius, and ulna, were without any covering of cartilage, hypertrophied, and misshapen. The humerus projected over the bones of the forearm, and accordingly the extremity of the olecranon was taken from its fossa in extension. In no position did the articular extremities of the bones exactly correspond, but in none did they completely separate. The greatly stretched musculus brachialis internus (anticus) was divided into three portions, of which the middle only was inserted into the lower part of the coronoid process. The two lateral portions, which slipped over the borders of the trochlea of the humerus, had each a sesamoid bone, which corresponded with a concave surface in the humerus. There was adhesion between the tendon of the biceps and the denuded surface of the humerus. There were two other sesamoid bones posteriorly, one in the anconeus, the other within the external lateral ligament.

A girl is at the present time in St. Bartholomew's Hospital, who has now recovered from an attack of strumous inflammation of the elbow-joint, of very severe character. I am convinced that the operation of excision of the articular ends of the bones would have been performed by many surgeons; the

idea would have suggested itself to more. The joint has been kept at rest, *i. e.*, by means of small well applied splints and careful bandaging. The practice of keeping the arm in a sling was insufficient; the usual bent splints of heavy wood were troublesome and inapplicable. The patient will leave the hospital well in a few days. The injury done to the structures proper to the joint is inconsiderable, and there is very free movement. The case has been under treatment about eight months, in one of Mr. Lawrence's wards. Now, when the result here obtained is contrasted with the results obtained by excision, the advantages which ensue from abstaining from the use of the knife are obvious. The forearm of a person with an excised elbow is for a long time moveable and weak, and often requires artificial support for many years. Many months must pass before the limb is useful, in the most favourable cases. It is true that there are cases requiring operation, where the cancellous texture of the bones is diseased or necrosed; but pathological anatomy teaches us that such accidents are mostly the result of violence done to inflamed structures, and may be avoided by skill on the part of the surgeon, and by care on that of the patient.

CHLORINE INHALATION IN DIPHTHERIA.

By C. F. HODSON, Esq., Bishop Stortford.

I AM induced by the continued prevalence of diphtheria and its extreme fatality in those cases where the larynx is involved, to communicate to my fellow associates a method of applying chlorine, which I have recently found so successful in an apparently hopeless case, that I cannot but think it will prove generally useful in the treatment of the more severe forms of diphtheria.

On Tuesday, November 30th, I received a summons to see a little girl, aged 3½ years, who had been poorly for several days, and was then supposed to be suffering with croup. An emetic was sent; and the child was visited shortly afterwards, when the nature of the disease was at once seen. The emetic had led to the removal of the exudation from the rima glottidis with considerable temporary relief, although the state of the fauces and nostrils, and the drowsy feeble condition of the child were such as to excite grave alarm. In the afternoon the gurgling returned; a second visit was demanded, when the treatment was adopted which is laid down in the excellent paper read by Mr. T. Stiles, at the Cambridge and Huntingdon Meeting of this Branch, (see JOURNAL for 1858, p. 628); this treatment I have hitherto found most satisfactory. Wine, beef-tea, eggs, etc., were given as far as possible; and the entrance to the larynx was freed from the exudation by the repeated use of the curved probang, the sponge being well wetted with Burnett's solution.

On the following Friday, the child became much worse, sleeping heavily, and the breathing becoming more and more obstructed; the probang afforded only trivial relief, and on the morning of Saturday the end seemed close at hand. I then proposed trying the effects of inhalation of the vapour of boiling water, mixed with a portion of solution of chlorinated lime. A very serviceable vapour-bath was thus extemporised. An earthen milk-pan was placed on the bed close to the child; above this a large open umbrella; shawls and a piece of drugget were thrown over, hanging down to the bed so as to enclose the child and milk-pan completely; the latter was then half filled with boiling water; and, lastly, a few spoonfuls of the chlorinated solution were added. After a few minutes the exudation became looser, and at the end of ten minutes, when the coverings were removed, the breathing was much freer. I directed this vapour-bath to be repeated every three hours, and occasionally a large sponge, dipped in boiling water, with a little of the solution sprinkled on it, held beneath the mouth and nose. For two days this plan was steadily pursued, and excepting for a few hours, the improvement was uniformly progressive.

From Sunday, December 6th, the interval was gradually increased, and after a few days the bath was used only twice or thrice in the twenty-four hours, until the child became convalescent. I should add, the bath was never unpleasant to the little patient, it was often commenced when she was asleep, and invariably gave immediate relief. It has rarely occurred to me, in the course of more than twenty-two years active practice, to witness a more gratifying result from such simple means.

CHLORINE IN THE TREATMENT OF DIPHTHERIA.

By STEPHEN S. ALFORD, Esq., F.R.C.S.Eng. and L.A.C.

IN describing the treatment I have adopted in cases of diphtheria, I do not pretend to suggest anything original; but I feel that every medical man should record, for the benefit of the profession, the treatment he has found most successful in this complaint.

Diphtheria consists of the formation of a dirty white fungus-like covering over the throat and palate, surrounded by and apparently growing in a jelly spawnlike exudation, which protrudes through, and extends beyond the white fungus. The disease is accompanied with rapid prostration of strength, and often proves fatal in less than forty-eight hours. The formidable constitutional effects arise, I presume, from the absorption of a poison generated by the disease. The real remedy, therefore, should be purely local; viz., to remove the poisonous growth, and to prevent its reforming, and to counteract or destroy its poisonous character.

If nitrate of silver, when applied, does not at once effectually destroy the morbid growth, so as to prevent its recurrence, it forms a covering, behind which the poisonous fungi can go on increasing, and rapidly poisoning the whole system. Indeed, no local application, if not *constantly applied*, is likely to be successful. I have, therefore, abandoned the caustic treatment.

Last March, having had several cases of diphtheria, I tried a gargle of chlorinated soda, of the strength of from half a drachm to a drachm in an ounce of water, to be used every ten or fifteen minutes, so as to wash away, and keep washed away, the morbid growth, and, by the constant application of the chlorine contained in the gargle, destroy the poisonous character of the disease. When this plan is persevered in, the white fungi and jelly-like mass are washed away; and the throat is kept free by constant gargling.

I believe the chlorine itself not only counteracts the poisonous nature of the morbid secretion, and destroys its deleterious character, but also has a beneficial effect on the system at large; and again, by destroying the virus, prevents its spreading to other members of the family. The disease has never spread where this plan has been adopted. All these points have satisfied me in the use of this remedy, and I am pleased to find others have found it equally successful, as noticed in the JOURNAL by Dr. Bryden. The character of the gargle is important, but I feel the frequently washing of the throat to be equally essential; and for this reason, I prefer the gargle being used every ten or fifteen minutes to the dilute hydrochloric acid only applied occasionally, as used in some of the metropolitan hospitals. In addition to the frequent washings of the throat, which I consider the treatment, I apply *spongio-piline*, frequently steeped in hot water, tied round the neck; and at once keep up the strength by stimulants; viz., wine and brandy, with eggs, arrowroot, or water. I give bark and chlorate of potass with henbane, and an anodyne at night (twenty minims of liquor opii sedativus); for sleeplessness has been a marked feature in all my cases; aperients of a warm but decided nature, and little or no mercury, make up the treatment I adopt. When the above plans have been carried out, I have found them invariably successful.

In several severe cases of ulcerated sore throat, the same gargle, constantly applied, has succeeded.

MELANCHOLY DEATH OF A YOUNG SURGEON. A melancholy accident occurred at the Norwich Dispensary on Saturday evening, Jan. 1st, resulting in the death of Mr. Alfred Dowson, a gentleman twenty-two years of age, who had been officiating during the last few days for his brother, Mr. Arthur Dowson, surgeon at that institution. It seems that the deceased took what he fancied was some tincture of orange-peel, but which really proved to be tincture of aconite. The unfortunate young man misread the labels on the bottles, one being marked "Tinct. Aurant.", and the other "Tinct. Aconiti." After making the fatal mistake he ate some supper, conversed cheerfully, and retired to rest; but he had not been long in bed when he found himself in such pain that he disturbed the establishment. Professional assistance was promptly at hand, but was rendered in vain, death soon terminating the sufferings of the deceased. At an inquest held by Mr. W. Wilde, city coroner, the jury, after hearing several witnesses, returned the following verdict:—"That the deceased took some tincture of aconite accidentally and by mistake, intending to take some tincture of orange-peel."