"I do not fail to notice that this position has serious objections, and that it is liable to inconveniences which must always, probably, prevent its being adopted as the usual plan of treatment for fractured arms. It is more inconvenient to get up and lie down, or even to sit down, in this position of the arm, and the hand is liable to swell. But I shall not be surprised to learn that experience will prove these objections to have less weight than we are now disposed to give them. Remember, the practice is yet untried—if I except the case which I am about to relate, and in which case, I am free to say, these objections scarcely existed. The swelling of the hand was trivial, and only continued through the first fortnight, and the patient never spoke of the inconvenience of getting up or sitting down, or even of lying down.

"The following is the case to which I have just referred: 'Michael Mahar, laborer, æt. 35, broke his left humerus just below its middle, Dec. 14, 1853. The arm was dressed by a surgeon in Canada West, and who is well known to me as exceedingly "clever." After a few days from the time of the accident, "the starch bandage was put on as tight as it could be borne, and brought down on the forearm, so as to confine the motions of the elbow-joint." Six weeks after the injury, January 29, 1854, Mahar applied to me at the hospital. No union had occurred. The motion between the fragments was very free, so that they passed each other with an audible click. There was little or no swelling or soreness. In short, everything indicated that union was not likely to occur without operative interference. The elbow was completely anchylosed. I explained to my students what seemed to me to be the cause of the delayed union, and declared to them that I did not intend to attempt to establish adhesive action until I had straightened the arm. They had just witnessed the failure of a precisely similar case, in which I had made the attempt to bring about union without previously straightening the arm.

"'On the 6th of February, 1854, we had succeeded in making the arm nearly straight. I now punctured the upper end of the lower fragment with a small steel instrument, and, as well as I was able, thrust it between the fragments. Assisted by Dr. Boardman, I then applied a gutta-percha splint from the top of the shoulder to the fingers, moulding it carefully to the whole of the back and sides of the limb, and securing it firmly with a paste roller. March 4th (not quite four weeks after the application of the splint) we opened the dressings for the second time, and carefully renewed them. A slight motion was yet perceptible between the fragments. March 18th, we opened the dressings for the third time, and found the union complete. This was within less than forty days. The patient was now dismissed. On the 29th of April following, the bone was refractured. Mahar had been assisting to load the "tender" to a locomotive. As the train was just getting in motion, he was hanging to the tender by his sound arm, while another laborer seized upon his broken arm to keep himself upon the car, and with a violent and sudden pull wrenched him from the tender and reproduced the fracture. The next morning I applied the dressings as before, and did not remove them during three weeks; at the end of which time the union was again complete. The splint was, however, reapplied, and has been continued to this time—a period of about six weeks.'"[1]

Since the date of the above paper I have several times had opportunities to test the value of this mode of treatment in cases of delayed union of the humerus, and in each case with the same favorable result. Donald Maclean, of Ann Arbor, Michigan, and several other surgeons, have adopted the same procedure in similar cases successfully.[2]

Measurement.—It may be well to indicate in this place by what method we shall best insure an accurate measurement of the arm, or forearm.

In either case, the point from which the measurement can be most satisfactorily made, above, is the posterior and inferior edge of the acromion process, at the most salient point of this margin, about opposite the scapulo-clavicular articulation. If the arm can be straightened, the extremity of either of the fingers can be used as the lower fixed point. If the arm cannot be straightened, we may use as the lower point either condyle, or the point of the elbow. In order to get the point of the elbow accurately, the hands should be clasped in front of the body; and as the elbows are pressed back, a rule may be laid beneath, and the measurements made from the upper surface of the rule.

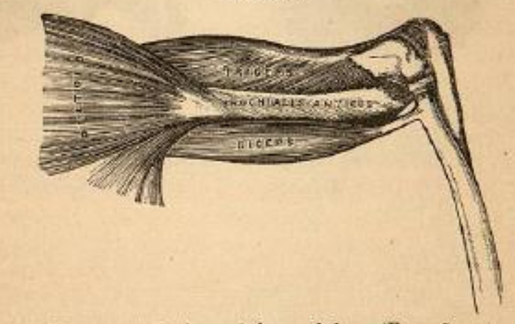
§ 6. Base of the Condyles.

Syn.—Supracondyloid Fractures of the Humerus.—Malgaigne.

Causes.—Of 18 fractures at this point, 12 occurred in children under ten years of age, the youngest being two years old.

In 11 cases the fracture had been produced by a fall, and it is presumed that the blow was received upon the elbow; in the remaining six cases the cause is not stated. I believe, therefore, that this fracture is

FIG. 77.



Fracture at the base of the condyles. (From Gray.)

generally the result of an indirect blow, inflicted upon the extremity of the elbow; in a few examples it has been produced by a blow received directly upon the point of fracture, as by the kick of a horse, etc., but I

[1] Buffalo Med. Journ., vol. x. pp. 14–147.
[2] Maclean, Phys. & Surg., May, 1880; also July, 1882.

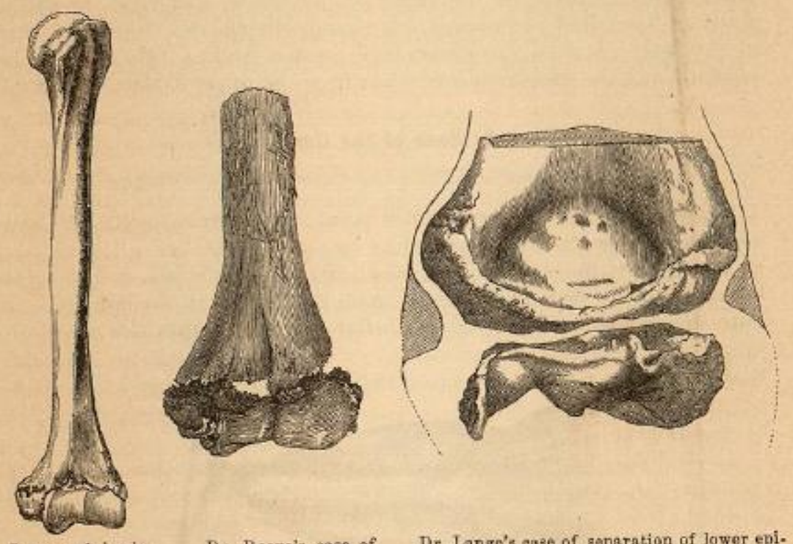
have never, save in a single instance, been able to trace it to a fall upon the hand. Dr. Shearer, U. S. A., has reported a case also, which seems to have occurred in the same manner.[1]

Direction of the Fracture, Displacement, and Symptoms.—I think this fracture is generally oblique, and its line of direction upwards and backwards; in nine of the eleven cases where this point was determined, such has been its apparent direction, and the lower fragment has been found drawn up behind the upper. Once I have found the lower fragment in front, and once on the outside of the upper.

Three of the 18 were compound comminuted fractures, this being a larger proportion of serious complications than is usually found in connection with fractures of long bones.

Separation of the Lower Epiphysis.—I have never met with what I supposed to be a separation of the lower epiphysis; but surgical writers

FIG. 78. FIG. 79. FIG. 80.



Lower epiphysis. Dr. Reeve's case of separation of the lower epiphysis. Dr. Lange's case of separation of lower epiphysis, and detachment of epicondyles.

have occasionally spoken of this accident, and the late Dr. Watson, of New York, believed that he had seen one example in an infant not quite two years old. The limb had been violently wrenched by the mother, in attempting to lift her. She was not seen by Dr. Watson until the fourth day, at which time the swelling was such that the diagnosis could not be easily made out; but on the ninth day "it was apparent that the shaft of the humerus had been separated from its cartilaginous expansion at the condyles, near the elbow." By the use of angular pasteboard splints

[1] M. M. Shearer, Act. Asst. Surgeon, U. S. A. Boston Journ. of Chemistry, Feb. 1, 1870.

the reduction was maintained, and the fragments became united after about four or six weeks.[1]

Dr. J. C. Reeve, of Dayton, Ohio, has sent me a specimen of epiphyseal separation, which occurred in his practice in the year 1864. A girl, æt. 10, fell a few feet, striking, probably, upon her elbow. The fracture was compound, and union not having occurred at the end of three weeks, the condition of the arm rendered amputation necessary. In this case a small fragment of the shaft came away with the epiphysis. Drs. Little, Voss, Buck,[2] and Lange,[3] of this city, have each reported a similar case. Champion,[4] so long ago as 1818, described the case of a boy 13 years old, in whom the epiphysis was torn off by the arm being caught in machinery; amputation became necessary, and the boy got well. Mr. Hutchinson[5] describes one case also.

In Champion's case, and in Dr. Reeve's, amputation became necessary. In Hutchinson's patient the upper fragment projected and was excised; the patient recovering with a stiff elbow. In Dr. Lange's patient the epiphysis was removed through the wound, and a portion of the shaft excised. He recovered with a useful arm.

I wish to call attention to the frequency with which examples of epiphyseal separation in the case of this bone, and of other bones, have been followed by suppuration. This will be found to be especially the fact in separations of the trochanter major, of the lower end of the femur, and lower end of the tibia. I shall not attempt at present to offer an explanation.

True Fractures at the Base of the Condyles.—The diagnosis of a fracture at the base of the condyles is attended with peculiar difficulties, and it has occasionally been mistaken for a dislocation of the radius and ulna backwards. Dupuytren says: "There is nothing so common as to see a fracture of the lower end of the humerus, immediately above the elbow-joint, mistaken for a dislocation backward;" and he mentions three cases which have come under his own observation. I have found an opposite error, however, by far the most frequent, namely, a dislocation of both bones backwards has been supposed to be a fracture.

The sources of this embarrassment are found in the proximity of the fracture to the joint, in the rapidity with which swelling occurs, and in the striking similarity of the symptoms which characterize the two accidents.

It will be necessary, therefore, to establish with care the differential diagnosis. The following are the signs of fracture:

1. Preternatural mobility, which, owing to the rapidity of the swelling and the contraction of the muscles whose tendons are stretched over the projecting ends of the bones, is often soon lost, being succeeded, sometimes after a few hours, by a rigidity equal to that which is usually present in dislocations, or even greater. It is especially difficult to flex the arm, owing to the projection of the upper fragment into the bend of the elbow.

[1] Watson. New York Journ Med., Nov. 1853, p 430, second series, vol. xi.
[2] Little, Voss, and Buck, New York Journ. Med., Nov. 1865, p. 133.
[3] Lange, N. Y. Surg. Soc., 1880.
[4] Champion, Journ. Comp. du des Sci. Med., t. 1, 1818, p. 323; Gurlt, op. cit., t. 1, 82.
[5] Hutchinson, Med. Times and Gaz., 1866, 1, p. 360.

2. Crepitus. This can usually be detected at any period if the arm is sufficiently extended, so as to bring the broken surfaces again into apposition.

3. When the extension is sufficient, reduction is easily effected, and the natural length of the arm is restored; but the limb immediately shortens when the extension is discontinued—especially if at the same moment the elbow is bent. This is a very important means of diagnosis.

4. A careful measurement, made from the point of the internal condyle to the acromion process, declares a positive shortening of the humerus.

5. By flexing and extending the forearm upon the arm, while the fingers are placed upon the lower portion of the humerus, the projecting fragments can be felt. Generally, the upper fragment being in front of the lower, and pressing down into the bend of the elbow, its end cannot be so easily recognized; but the upper end of the lower fragment can easily be made out, posteriorly, when the forearm is considerably flexed. The lower end of the upper fragment feels more rough, and is less wide, than in dislocations.

6. The whole of the lower fragment is carried backwards, and with it the radius and ulna, producing a striking prominence of the elbow and olecranon process. Efforts to straighten the forearm upon the arm, when no extension is used, increase rather than diminish this projection.

7. The forearm is slightly flexed upon the arm, the angle made at the elbow being 25 or 30 degrees.

8. The hand and forearm are pronated.

9. The relations of the olecranon process with the two condyles remain unchanged.

In a case of *epiphyseal separation*, the lower end of the upper fragment has greater breadth than in the case of a fracture at the base of the condyle, and the line of separation is nearer the end of the bone.

Signs of a Dislocation of the Radius and Ulna Backwards.—1. Preternatural immobility. That is to say, extension and flexion are limited, but there is almost always present a preternatural lateral mobility.

2. Absence of crepitus. It is in this joint especially that surgeons have been deceived by the chafing of the dislocated bones upon the inflamed joint surfaces, and have supposed that they discovered crepitus when no fracture existed. The rapidity with which inflammation delops itself after dislocations of the elbow-joint, and the consequent abundant effusion of lymph, afford the probable explanation of this frequent error.

3. When reduced, the bones are not generally disposed to become again displaced, even though the elbow should be flexed.

4. The humerus is not shortened, but the olecranon process approaches the acromion process.

5. There are no sharp projecting points of bone. The lower end of the humerus may not always be felt in the bend of the elbow; but when it is felt, it is found to be relatively smooth, broad and round.

6. A remarkable prominence of the elbow and olecranon process, which prominence is sensibly diminished when an effort is made to straighten the forearm on the arm.

7. Forearm flexed upon the arm to about the same degree as in fracture.

8. Hand and forearm pronated as in fracture.

9. Relations of the olecranon process to the condyles changed very greatly.

The most constant diagnostic signs are, then, in the case of a fracture, crepitus, shortening of the humerus, projection of the sharp ends of the fragments, and an increase of the projection of the elbow when an attempt is made to straighten the arm; and in the case of a dislocation, the absence of crepitus, humerus not shortened, while the olecranon approaches the acromion process; the smooth, round head of the humerus lost, or indistinctly felt in the bend of the elbow, and the projection of the point of the elbow diminished when the attempt is made to straighten the forearm on the arm.

It is proper, also, to repeat here what we have already said in relation to the causes of this fracture. A fracture at this point is produced almost always by a fall upon the elbow, but a dislocation of the radius and ulna backwards can never be. On the other hand, a dislocation is produced, in most cases, by a fall upon the palm of the hand, while I have never known but one fracture above the condyles to be thus produced.

Results.—Nine times have I found the arm shortened from half an inch to one inch, or a little more.

Muscular anchylosis is almost always present when the apparatus is first removed, and it is seldom completely dissipated until after several months; but I have found more or less anchylosis at seven and nine months; and twice after the lapse of three years the motions of the joint have been very limited. A few years since, I examined the arm of a gentleman who was then twenty-seven years old, and who informed me that when he was four years old he broke the humerus just above the condyles. There still remained a sensible deformity at the point of fracture—he could not completely supine the forearm. The whole arm was weak, and the ulnar nerve remarkably sensitive. The ulnar side of the forearm, and also the ring and little fingers, were numb, and have been in this condition ever since the accident. I know the surgeon very well who had charge of this case, and I have no doubt that the treatment was carefully and skilfully applied.

In June of 1850, I operated upon a lad, nine years old, by sawing off the projecting end of the upper fragment, whose arm had been broken nine months before. This fragment was lying in front of the lower, and the skin covering its sharp point was very thin and tender. There was no anchylosis at the elbow-joint, but the hand was flexed forcibly upon the wrist, the first phalanges of all the fingers extended, and the second and third flexed. Supination and pronation of the forearm were lost. The forearm and hand were almost completely paralyzed, but very painful at times. The ulnar nerve could be felt lying across the end of the bone.

In the hope that some favorable change might result to the hand by relieving the pressure upon the nerve, yet with not much expectation of success, I exposed the bone and removed the projecting fragment. The nerve had to be lifted and laid aside. About one year from this time I found the arm in the same condition as before the operation.

Non-union is a result not so frequent in fractures at this point as higher up; but Stephen Smith, of the Bellevue Hospital, New York, reports a case of non-union in a young man of twenty-three years. He was admitted to the hospital on the seventh day after the accident. The fracture was simple and transverse, yet at the end of four months he was dismissed "with perfectly free motion at the point of fracture."[1] The failure to unite was attributed to a syphilitic taint.

A case was tried a few years since in the Supreme Court at Brooklyn, N. Y., in which, after a simple fracture at this point, the arm being dressed with splints and bandages, the little finger sloughed off in a condition of dry gangrene, and the adjacent parts of the hand were attacked with moist gangrene. Drs. Parker and Prince believed that this serious accident was the result of bandages applied too tightly and suffered to remain too long, while Drs. Valentine Mott, Rogers, Wood, Ayres, Dixon, and others, believed the gangrene might have been due to other causes over which the surgeon had no control.[2]

A few years ago, a similar case occurred in the town of Spencer, Tioga Co., N. Y.; a boy, six years old, having broken his humerus just above the condyles. The fracture was oblique. The surgeon who was called to treat the case was an old and highly respectable practitioner. I am not informed of the plan of treatment any farther than that a roller was applied. On the eighth day, a second surgeon was employed, who, finding the hand cold and insensible, removed all of the dressings; after which the thumb and forefinger sloughed, with other portions of the skin and flesh of the hand and arm. The surgeon who was first in attendance was prosecuted, and the case was tried in the Supreme Court of that county, but the jury found no cause of action. Dr. Hawley, of Ithaca, and the late Dr. Webster, of Geneva Medical College, testified that, in their opinion, the death of the fingers was owing to the pressure of the fragment upon the brachial artery, and not to the tightness of the bandages.

Dr. Gross has also informed us of still another case of the same character, which occurred in Warren Co., Ky. A boy, ten years old, had broken his arm above the condyles, and his parents having employed a surgeon residing at some distance, the dressings were applied, and directions given to send for the surgeon whenever it became necessary. The parents saw the arm swell excessively, and knew that the boy was suffering very much, but did not notify the surgeon until the tenth day, when the hand was found to be in a condition of mortification, and at length amputation became necessary.

Long afterward, in the year 1851, when the boy became of age, he prosecuted his surgeon, but with no result to either party beyond the payment of their respective costs.

[1] Smith, New York Journal of Medicine, May, 1857, p. 386, third series, vol. ii.
[2] New York Medical Gazette, vol. xii. pp. 46, 80, 111.

A similar case has been reported to me by Dr. Lyman Twomley, of Little Valley, Cattaraugus County, in this State. Dr. Twomley is a well-known and experienced surgeon and physician. In the fall of 1860, Dr. T. was called to a boy æt. 7, who had fallen ten feet and broken his right arm at the base of the condyles. Although but twelve hours had elapsed, the limb was greatly swollen. The lower end of the upper fragment projected through the skin three inches. His pulse was feeble and intermittent. Dr. T. administered chloroform and adjusted the fragments. Light splints were applied, and cold lotions. On the fifth day gangrene commenced, and on the seventh day Dr. T. amputated at the point of fracture. The wound resulted in the formation of a good stump. Examining the limb after amputation, the joint was found filled with blood, in a putrid state, and the tissues above and below were infiltrated with the same. Both of the lateral and the anterior ligaments of the joint were badly torn. The biceps and brachialis anticus were much torn. A small portion of the olecranon process, and more of the coronoid processes were broken off. The brachial artery was ruptured, and the median nerve seriously injured. There was also a partial fracture of the carpal extremity of the radius.

When this boy became of age he entered a suit against the doctor for malpractice, in having, he affirmed, made an unnecessary amputation of the arm. I am informed that the allegations were not sustained by the Court, and in this decision all surgeons must heartily concur.

While I would not deny that in some of the preceding cases the sloughing might have been solely due to the tightness of the bandages, against which cruel and mischievous practice we cannot too strongly protest, a knowledge of the anatomy of these parts, and the opinions of the very distinguished gentlemen who testified in defence of these surgeons, must compel us to admit the possibility of such accidents where the treatment has been skilful and faultless.

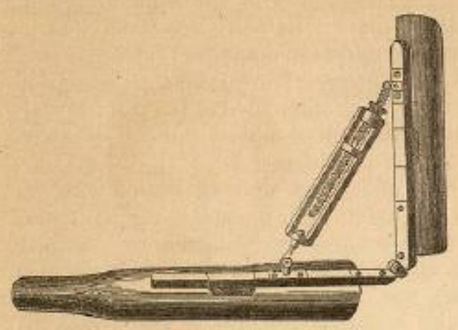
Treatment.—The splints formerly much employed in this country, in fractures about the elbow-joint, and perhaps still used by some American surgeons, are simple angular side-splints, without joints, such as those recommended by Physick;[1] angular pasteboard splints, felt, leather, gutta percha, etc., or angular splints with a hinge, such as Kirkbride's,[2] Thomas Hewson's, Day's, Rose's, Welch's, or Bond's.

Kirkbride's splint, which is said to have been used in the Pennsylvania Hospital in several instances, is composed of two pieces of board, connected together by a circular joint, and having eyes on the inner edge, two inches apart, and holes through the splint at graduated distances between them. There is also a swivel eye, passing through the upper part of the splint, and riveted below. A wire is fastened to the swivel, and bent at right angles at its other extremity, of a size to fit the eyes and holes in the splint. This splint, properly supported by pads, is to be placed either upon the outside or inside of the arm, and secured by rollers. When the angle is to be changed, the wire is unhooked and removed to another eye, or to some of the intermediate holes upon the

[1] Elements of Surgery, by John Syng Dorsey, Philadelphia edition, vol. i. p. 145.
[2] American Journal of the Medical Sciences, vol. xvi. p. 315.

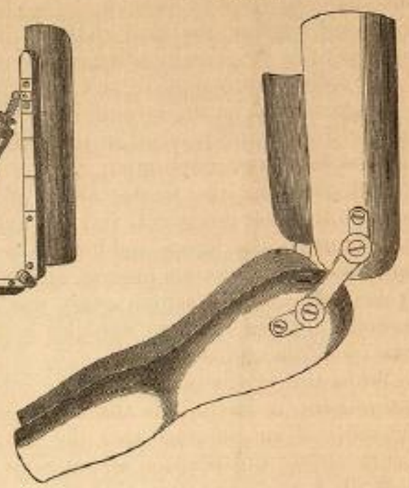
side of the splint. Dr. Kirkbride reports two cases of fracture of the lower part of the humerus treated by this plan, one of which resulted in anchylosis, but the other was much more successful.

FIG. 81.



Rose's splint.

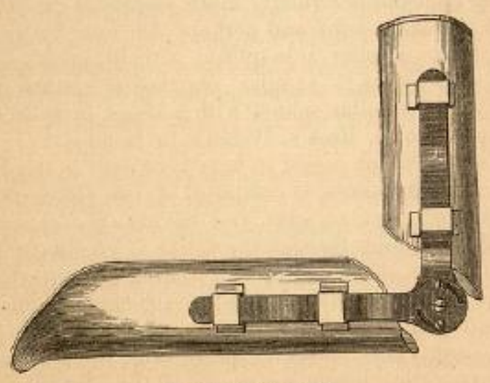
FIG. 82.



Welch's splint. The hinges may be transferred to splints of different sizes.

H. Bond, of Philadelphia, has contrived a very ingenious splint for the elbow-joint, and which is designed also to afford a complete support to the forearm.

FIG. 83.



Bond's elbow splint

For myself, I generally prefer a thick sheet of gutta percha, moulded and applied accurately to the limb. It should be extended beyond the elbow to the wrist, so as to support the whole length of the arm, elbow, and forearm. Some experience in the use of wooden angular splints has

convinced me that they cannot be very well fitted to the many inequalities of the limb; and neither pasteboard nor binder's board has sufficient firmness, especially in that portion which covers the joint. Angular splints, furnished with a movable joint, possess the advantage of enabling us to change the angle of the limb at pleasure, and of keeping up some degree of motion in the articulation without disturbing the fracture or removing the dressings; but the crossbars of Day's and Rose's splints render them complicated, and are in the way of a nice application of the rollers; while they are all equally liable to the objection stated against angular wooden splints without joints, viz., that they seldom can be made to fit accurately the many irregularities of the arm, elbow, and forearm. In applying the author's splint, care must be taken that the humeral portion is not too short, or the result will be an unnecessary degree of overlapping of the fragments. This may generally be avoided if the surgeon will first shape his material to the sound arm, while the whole length is underlaid with three or four thicknesses of woollen cloth. Welch's splints, made of a material possessing a slight amount of flexibility, approach more nearly the accomplishment of all the indications than any other manufactured splint with which I am acquainted, but the number of cases in practice to which they are applicable will be found to be limited, while gutta percha has no limit in its application.

FIG. 84.

The author's gutta-percha splint.

Whatever material is employed, the splint should be first lined with one thickness of woollen cloth, or some proper substitute. A pretty large pledget of fine cotton batting ought also to be laid in front of the elbow-joint, to prevent the roller from excoriating the delicate and inflamed skin; and great care should be taken to protect the bony eminences about the joint, or, rather, to relieve them from pressure, by increasing the thickness of the pads above and below these eminences.

At a very early day, so early, indeed, as the seventh or eighth day, the splint should be removed, and, while the fragments are steadied, the joint should be subjected to gentle, passive motion. This practice should be repeated as often as every second or third day, in order to prevent, as far as possible, anchylosis. If much swelling follows the injury, it is my custom to open the dressings, without removing the splints, on the second or third day after the accident, or at any time when the symptoms admonish of its necessity. Occasionally, it is well to change the angle of the splint before reapplying it. If the angular splint with a

movable joint is used, slight changes may be made while the splint is on the arm; but if the angle is much changed without removing the rollers, they become unequally tightened over the arm, and may do mischief.

When anchylosis has actually taken place, we may more or less overcome the contraction of the muscles and of the ligaments by gentle, passive motion, or by directing the patient to swing a dumb-bell or some other heavy weight, as first recommended by Hildanus; but we must bear in mind the danger of causing a refracture by too early or immoderate force.

§ 7. Fracture at the Base of the Condyles, complicated with Fracture between the Condyles, extending into the joint.

This fracture, which is but a variety or complication of the preceding, is even more difficult of diagnosis; and its signs, results, and proper treatment differ sufficiently to demand a separate consideration.

Fig. 85.

Fracture at the base of, and between, the condyles.

I have recognized the accident six times. Confined to no period of life, it seems to be the result of a severe blow inflicted directly upon the lower and back part of the humerus, or upon the olecranon process. Dr. Parker, of New York, was inclined to regard an obscure accident about the elbow-joint, which he saw in a lad sixteen years old, as a longitudinal fracture of the humerus, with separation of one condyle, but which had been occasioned by a fall upon the hand.[1] For myself, I should regard this latter circumstance as presumptive evidence that it was not a fracture of this character, yet I do not mean to deny the possibility of its occurrence in this way.

Its characteristic symptoms are, increased breadth of the lower end of the humerus, occasioned by a separation of the condyles; displacement upwards and backwards of the radius and ulna; shortening of the humerus; crepitus and mobility at the base of the condyles, with crepitus also between the condyles, developed by pressing them together; or in case the radius and ulna are drawn up and back, the crepitus may be detected, after restoring these bones to place, by pressing upon the opposite condyles.

Its consequences are, generally, great inflammation about the joint, permanent deformity, and bony anchylosis. An opposite result must be regarded as fortunate, and as an exception to the rule.

Of the treatment, we can only say that it must be chiefly directed to the prevention and reduction of inflammation; at least during the first few days. Nor is this inconsistent with an early reduction of the fragments, and moderate efforts, by splints and bandages, such as I have directed in case of a simple fracture at the base of the condyles, to keep the fragments in place. No surgeon would be justified in refusing altogether to make suitable attempts to accomplish these important indications; but he must always regard them as secondary when compared with the importance of controlling the inflammation.

[1] Parker, New York Journal of Medicine, Nov. 1856, p. 391, 3d series, vol. i.

When splints are employed, the same rules will be applicable, both as to their form and mode of application, as in cases of simple fracture above the condyles. Plaster of Paris, or some of the immovable forms of dressing, furnished with ample fenestræ, will sometimes be preferred.

The following examples will more completely illustrate the character, history, and proper treatment of these cases than any remarks or rules which I can at present make.

A woman, æt. 44, fell upon the sidewalk in January, 1850, striking upon her right elbow. I saw her a few minutes after the accident, but the parts about the joint were already considerably swollen, and it was not without difficulty that the diagnosis was made out. The forearm was slightly flexed upon the arm, and pronated. On seizing the elbow firmly, a distinct motion was perceived above the condyles, and a crepitus. I could also feel, indistinctly, the point of the upper fragment. While moderate extension was made upon the arm, the condyles were pressed together, when it was apparent that they had been separated. On removing the extension, they again separated, and the olecranon drew up. She was in a condition of extreme exhaustion, and the bones were easily placed in position.

An angular splint was secured to the limb, and every care used to support the fragments completely, but gently.

From this date until the conclusion of the treatment the dressings were removed often, and the elbow moved as much as it was possible to move it.

Seven months after the accident, the elbow was almost completely anchylosed at a right angle. The fingers and wrist, also, were quite rigid. Six years later, the anchylosis had nearly disappeared; she could now flex and extend the arm almost as much as the other; the wrist-joint was free, and the fingers could be flexed, but not sufficiently to touch the palm of the hand. The line of fracture through the base could be traced easily, but the humerus was not shortened. There was, moreover, much tenderness over the point of fracture through the base, and at other points. Occasionally, a slight grating was noticed in the radio-humeral articulation. She experienced frequent pains in the arm, and especially along the back and radial border of the ring finger. During the first year or two after the accident, the arm wasted very much, but although the hand remained weak, the muscles were now well developed.

A gentleman was struck with the tongue of a carriage with which a couple of horses were running. The blow was received directly upon the back of the left elbow. Dr. Sprague and myself removed some small fragments of bone, and while opening the wound for this purpose, we could see distinctly the line of fracture extending into the joint as well as across the bone. The condyles were not separated.

The subsequent treatment consisted only in the use of such means as would best support the limb, and most successfully combat inflammation. The arm and forearm were laid upon a broad and well-cushioned angular