December, January, and February are considered the most available months for Luxor. The town has four thousand inhabitants, with two good hotels and English physicians. "The invalid should not leave the house before 10 A.M. or remain out after sunset." During these three months the bedroom temperature is generally above 63° F. As seen from the table the daily range of temperature is great. The drinking-water, as is generally the custom, comes from the Nile and is filtered. There is much of interest in and about Luxor in the many Egyptian ruins and antiquities.

Assouan is 133 miles higher up the river than Luxor, 583 miles south of Cairo. Besides being warmer than Luxor, its climate is about the same, although the air is said to be freer of dust storms. There is a large and comfortable hotel here, and as rain never falls, the roofs are carpeted, with easy chairs in the shady corners. The air is so dry that the heat is not uncomfortable, and the same clothing is recommended to be worn as in an English winter. Here, as elsewhere, the cool night air is to be avoided.

The Nile voyage is best made between November and March, and one can make the journey either by steamer or dahabiyeh; the latter method is of course the most enjoyable, and weeks may be occupied in making it. The steamers have at least one advantage, that of carrying a physician. "If there is anything in life," says Peterson,* "which will steal away worries and cares, soothe the tired brain, calm the unstrung nerves, bring back vagrant sleep, it is the dream-like voyage on the Nile in a dahabiyeh." For an invalid, however, particularly if he is suffering from throat or lung trouble, this delightful journey is not without its risks; for the nights are cold and frosty, the mists cover the river in the early mornings, and the wind is sometimes strong and "dangerously cold for an invalid."

Camping in the desert, when this method of life is available, is perhaps the most effectual means of utilizing the advantages of the Egyptian climate. "Our experience of treatment," say Weber and Foster in Allbutt's "System of Medicine," 1896, "by continued residence during several entire years in the Nubian desert under tents shifted from one place to another, has, in several advanced cases of consumption, given results which are altogether superior to any obtained from any health resort or from any other treatment." "Camp life in Egypt," says Peterson (*loc. cit.*), "is something luxurious. Labor and carrying cost next to nothing, and everything in the way of furniture and supplies can be stored away somewhere on a canal. Every day can be foreseen to be rainless and beautiful; life in tents becomes a pleasure."

The diseases for which the Egpytian climate is to be recommended are: (1) Phthisis in the early or advanced cases, if the conditions are not acute; hemorrhagic cases; cases associated with bronchitis. Benefit is said also to be obtained in the first, second, or third stage of the disease, if not acute, especially when the origin of the affection was pneumonic, broncho-pneumonic, or pleuritic. Both C. T. Williams and Sandwith give series of cases with fairly favorable results. (2) Chronic bronchitis and emphysema; asthma. (3) Rheumatism and rheumatic arthritis. (4) Bright's disease and albuminuria. (5) Chronic nasal and pharyngeal catarrh and deafness dependent upon abnormal conditions of the Eustachian tube. (6) Convalescents from pneumonia, pleuro-pneumonia, and pleurisy, and various acute specific diseases. (7) Neurasthenia and cases of mental strain and breakdown. (8) Atheroma and arteriosclerosis. (9) Hemiplegia and paresis. (10) Anæmia. (11) Heart disease. (12) The old and prematurely aged. (13) Neuralgias.

The cases for which this climate is contraindicated are: (1) Intestinal ulceration, chronic dysentery, or any tendency to diarrhœa. (2) Well-marked diabetes. (3) Laryngeal ulcerations. (4) Rapidly advancing and active phthisis. (5) Tuberculous kidneys.

"The advantage of the Egyptian climate in the treatment of phthisis lies in the warm sunny days, the dryness of the atmosphere, and the aseptic character of the air. Its drawbacks are: the short time of year during which it is available, and the danger of contracting chills, chiefly abdominal" (Weber and Foster, Allbutt's "System of Medicine"). The hygienic-dietetic treatment of phthisis in a well-conducted sanatorium, in almost any temperate climate, where pure air, sunshine, and freedom from dust and wind can be obtained, would probably give a much higher average of favorable results; for the treatment could be continued until the cure had been effected, without change of locality, and, what is of vital importance, the patient would be under constant medical supervision, and would be kept up to the strenuous work of getting well.

The expense of living and travelling in Egypt is greater than in most European countries, but probably no greater than in the United States for the same accommodations, if as great. One can now take a steamer from New York and go directly to Alexandria, or go from London, Plymouth, Marseilles, Naples, Genoa, or Venice. The steamers from New York to Genoa, Naples, or Alexandria are large and comfortable, and going by the "southern route" the voyage is likely to be a smooth one.

For further consideration of the climate of Egypt, one is referred to "Egypt as a Winter Resort," by F. M. Sandwith of Cairo, 1889.—"The Climate of Egypt," by E. Symes Thompson, M.D. *The Practitioner*, 1895, vol. lv., p. 532.—"Notes on Egypt as a Health Resort," by P. Watson Williams, M.D. *Bristol Medico-Chirurgical Journal*, 1895, vol. xiii., p. 262.—"Wintering in Egypt," by Frederick Peterson, M.D. *Medical Record*, 1892, vol. xlii., p. 205.

Edward O. Otis.

EHRLICH DIAZO REACTION. See *Typhoid Fever*.

EIGON is a name given by Dieterich to a series of albumin and iodine compounds of constant composition.

Alpha-eigon (albumin iodatum) is an odorless, tasteless, light-brown powder, containing twenty per cent. of iodine, which is set free by alkalies and more readily by acids.

Alpha-eigon-sodium (sodium iodo-albuminatum) is nearly colorless, odorless, almost tasteless, and readily soluble in water. It contains fifteen per cent. of iodine, and in four or five times the dose is used to replace potassium iodide.

Beta-eigon (peptonum iodatum) is a compound of fifteen per cent. of iodine with predigested albumen (peptone), designed for the easy ingestion of large quantities of iodine in the presence of gastric disturbances. Administered in malt extract, wine, or cod-liver oil, these substances have been used internally in place of iodides in syphilis, scrofula, furunculosis, etc. After long use in large dose, no symptoms of iodine intoxication supervened. Externally, in wounds, boils, and venereal ulcers, Tischer and Beddies found them more effective than iodoform, and preferable on account of the absence of odor. They use it in ten to thirty per cent. strength, diluted with talcum powder. The internal dose is 1 gm. (gr. xv.) three times a day, gradually increased.

W. A. Bastedo.

EKA-IODOFORM is iodoform prepared by electricity and mixed with 0.05 per cent. of paraform. It does not decompose in ethereal solution, but in contact with the tissues generates gaseous formaldehyde. It is recommended as a succedaneum for iodoform.

W. A. Bastedo.

ELASTICA.—See *Rubber*.

ELATERIN.—Elaterinum.—"A neutral principle obtained from elaterium, a substance deposited by the juice of the fruit of *Ecballium Elaterium* (L.) A. Rich. (fam. *Cucurbitaceæ*)." U. S. P.

This, the wild or squirting cucumber, is a small perennial or, in temperate climates, sometimes annual herb, with a fleshy, tapering root, and succulent, prostrate, cucumber-like stems. The fruit, which is also official in some countries, where the plant grows, is from three to six centimetres long, by one or two in diameter (1 to 2½ in. by ½ to ¾ in.), oblong, ovoid, covered with fleshy, tapering, soft bristles, and of a yellowish-green color. Texture firm externally, but soft and very watery in the middle. At maturity the tension produced by the accumulation of liquid within the pericarp becomes so great as to burst the fruit at the base, forcing off the peduncle, with a squirt of the soft contents, seeds and all, to a considerable distance. From this peculiar mode of distributing its seeds the plant has received its name (ἐκβάλλω). The seeds are numerous, compressed, ovoid, smooth, brown; they also were formerly employed.

This plant is indigenous to Persia, India, and the warmer Mediterranean countries. It has also been naturalized and cultivated in various parts of Europe. It is raised in England and elsewhere for medicinal use. It is a very old medicine, having been mentioned before the Christian era.

The fruit, for medicinal purposes, should be gathered just before it is wholly ripe, and, of course, before it has expelled its contents. It is used to prepare the crude and impure elaterin, which has been long known as *Elaterium* (B. P., also U. S. P. of 1870), and is still the more common article in the markets.

Elaterium.—This is a precipitate which forms spontaneously in the liquid juice of the ecballium fruits, and is collected as a sediment from it. The purer and clearer this juice, therefore, the better the precipitate. There are several ways of collecting it, two of the best being as follows: The British Pharmacopœia formerly directed to "Take of the squirting cucumber fruit, very nearly ripe, one pound. Cut the fruit lengthwise, and lightly press out the juice. Strain it through a hair sieve, and set it aside to deposit. Carefully pour off the supernatant liquid; pour the sediment on a linen filter, and dry it on porous tiles in a warm place. The decanted fluid may deposit a second portion of sediment, which can be dried in the same way." Dr. Clutterbuck saved the juice of the sliced fruit, and then scooped the soft pulp out with the thumb, threw it upon a sieve to drain, and washed it with water without pressure. These liquids were set aside, and the precipitate collected and dried as above. This method produced a very fine quality of Elaterium, which has been famous for more than half a century. Elaterium appears to be good in proportion to the near approach to ripeness of the fruit used, and to the absence of pressure in manipulating it. The continental grades of this article are generally inferior to the English, whose properties are thus given in the British Pharmacopœia:—"In light, friable, flat, or slightly curved opaque cakes about one-tenth of an inch (2.5 mm.) thick; pale green, grayish-green, or yellowish-gray; fracture finely granular; odor faint; tea-like; taste bitter and acrid. It should not give the characteristic reactions with the tests for carbonates or for starch, and should yield half its weight to boiling alcohol (ninety per cent.). When exhausted with chloroform, the solution evaporated, the residue washed with ether, and the process of solution, evaporation, and washing repeated, elaterium should yield twenty-five per cent., or not less than twenty per cent., of elaterin."

The poorer, German elaterium, comes in thicker (about ¼ in.) cakes, largely wanting in the green color and sparkling appearance. It is about one-fourth as strong. The yield of the fruit is about 0.123 per cent. of elaterium. Besides the active principle, coloring matter, cellular tissue, starch, ash, and water make up the rest.

Elaterin.—Discovered by Morries and Hennell, 1831. The most scrupulous care must be taken not to confuse the dosage of this powerful poison with that of the weaker substance described above. This crystalline substance has been adopted by our Pharmacopœia, to the exclusion of elaterium, in consequence of the very uncertain quality of the latter drug. It is also official in Great Britain.

It is a definite chemical combination of the formula $C_{20}H_{28}O_5$, and is thus described in our Pharmacopœia: Minute, white, hexagonal scales, or prismatic crystals, without odor, and having a slightly acrid, bitter taste; permanent in the air.

Soluble, at 15° C. (59° F.), in 4,250 parts of water, and in 337 parts of alcohol; in 1,820 parts of boiling water, and in 34 parts of boiling alcohol; also soluble in 543 parts of ether, or in 2.4 parts of chloroform.

At 190° C. (374° F.) the crystals begin to agglutinate, and at about 209° C. (408.2° F.) they melt, forming a yellowish-brown liquid. When ignited, they are consumed without leaving a residue.

Elaterin is neutral to litmus paper.

Elaterin is dissolved by solutions of the alkalies, and reprecipitated on supersaturating with an acid.

When dissolved in cold, concentrated sulphuric acid, it causes the latter to become yellow at first, which color gradually changes to scarlet.

On dissolving some crystals of elaterin in melted carbolic acid, and then adding a few drops of strong sulphuric acid, a crimson color will be developed which soon becomes scarlet.

An alcoholic solution of elaterin should not be precipitated by tannic acid T.S., mercuric chloride T.S., or platinic chloride T.S. (absence of, and difference from, *alkaloids*).

Action and Use.—Elaterin is the most active and certain of known hydragogue cathartics, purging repeatedly and comparatively painlessly in exceedingly minute doses. In larger ones, colic, nausea, vomiting, and prostration may follow. It is especially indicated when there is no inflammatory trouble in the digestive tract, and it is desirable both to empty the latter of its contents and to secure a copious transudation of water from the blood to its canal. Such conditions are frequently present in cardiac and renal diseases, accompanied by general dropsy; occasionally also in ascites from various causes, and in cerebral congestion, plethora, concussion, or compression of the brain, etc. For all these there is no better hydragogue than this. To be efficient, it should be given by the mouth, as it is very much less active in injections either into the rectum or into the cellular tissue; and in inunction it scarcely produces any but local effects. It is said, further, that the presence of bile in the intestines is essential to its full effect; but the proposition can scarcely be considered as finally settled. It is, no doubt, necessary that the intestinal contents should be alkaline.

Upon dogs, rabbits, and some other animals, it is an uncertain cathartic, and may even kill by nervous depression, without moving the bowels at all. After death by it, in man, signs of gastro-intestinal inflammation have been present.

Administration.—Elaterium is very variable in its strength, and while of Clutterbuck's or the best English the dose is about a centigram (gr. ⅛ to ¼), that of the ordinary Malta or German varieties may be five or six times as large. In an untried sample, the smaller dose should always be started with and increased until found to be sufficient. Elaterin is uniform, and should supersede the impure substance just mentioned. Dose 0.0015 to 0.006 (gr. $\frac{1}{40}$ to $\frac{1}{10}$). The officinal trituration (*Trituratio elaterini*, U. S. P.), strength $\frac{1}{10}$, is a convenient form. Dose, 0.015 to 0.06 gm. (gr. ¼ to 1).

Elaterin should always be given well diluted.

W. P. Bolles.

ELBOW.—*Extent.*—The term elbow is often used to indicate merely the angular projection made between the arm and forearm. The region of the elbow includes the joint and all the parts that surround and cover it. Externally there are no well-marked lines that separate this region from the arm above or the forearm below, and the rule established by Tillaux of limiting its boundaries to two finger-breadths above and two below the transverse cutaneous fold caused by the flexion of the joint, is probably as good as can be devised.

Configuration.—(See Fig. 1814.) In shape this region differs from those above and below, being somewhat broader, flatter, and hollowed in front by a shallow de-

* Medical Record, August 20th, 1892.

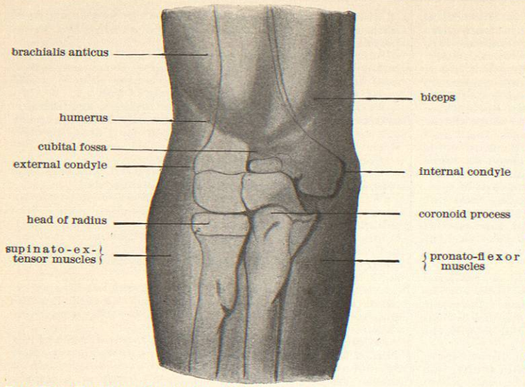

FIG. 1814.—The Elbow Viewed from the Front, the Bones Showing as if the Arm was Semitransparent.

pression known as the cubital fossa, distantly resembling the popliteal space behind the knee, while posteriorly a rounded projection appears even in the most extended state of the arm. These peculiarities of shape are due partly to skeletal form and partly to muscular grouping. On either side project the condyles of the humerus with muscular masses arising therefrom; behind, the olecranon process of the ulna forms the "point of the elbow" already mentioned. In front and behind, the muscles that have formed the rounded bulk of the upper arm become reduced to tendinous bands, thus occasioning the antero-posterior flattening.

The cubital fossa is shaped somewhat like a swallow's tail, hence the older anatomists called it the chelidon (χελιδών, a swallow). This shape is determined by the two converging muscular masses arising from the condyles on either side, between which is wedged the rapidly decreasing mass of the muscles descending from the front of the upper arm.

The bony landmarks about the elbow are of extreme importance in the diagnosis of injuries and as guides in surgical operations. At the outer side the external supracondylar ridge may be felt and readily traced downward to the external condyle. Below and behind this, between eminences caused by the supinator longus together with the radial extensors of the wrist on the outer side, and the anconeus internally, there is a depression, well marked in all individuals, at the bottom of which there may be felt the head of the radius.

At the inner side the internal condylar ridge may also be traced by pressing deeply. Occasionally there is found here, at a distance of one or two inches above the inner condyle, a bony hook known as the supracondyloid process. From the summit of this hook there extends to the condyle a fibrous band affording origin to part of the humeral head of the pronator radii teres muscle, and through the osteo-fibrous canal thus formed pass the brachial artery, or one of its branches, and the median nerve; the presence of this process is said to be associated with a high division of the brachial. This arrangement occurs in about one per cent. of individuals and appears to be the homologue of an osseous canal found in many mammals, such as carnivores, rodents, and some inferior apes.

The internal condyle is sharper, a little higher, and not so well covered with muscles as the outer one. It is therefore more prominent and must be carefully padded when splints are applied at the elbow. Its most prominent part is directed backward rather than inward. Between it and the olecranon is the groove by which the ulnar nerve passes to the lower arm.

The olecranon process projects more or less in all positions of the joint. Its upper border is obscured by the tendinous insertion of the triceps, which

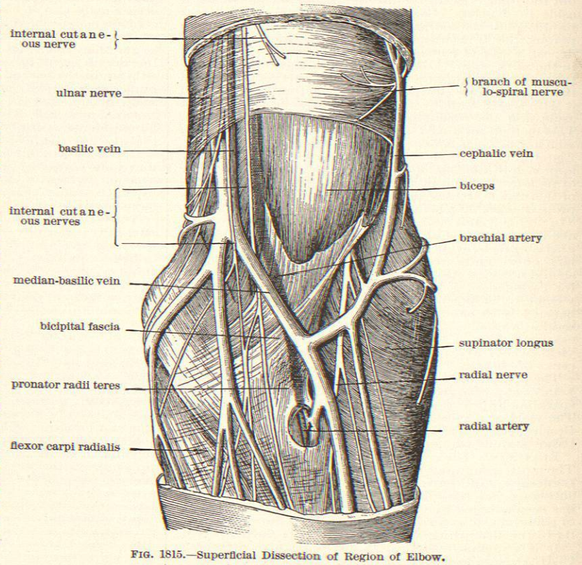

FIG. 1815.—Superficial Dissection of Region of Elbow.

usually has a bursa beneath it. A subcutaneous bursa is almost invariably found over that portion of its surface on which the weight rests when leaning on the elbow. The relative position of the upper border of the olecranon and the two condylar prominences varies according to the degree of flexion of the joint. When it is fully extended, the three prominences are in line; when at a right angle, the border of the olecranon is immediately beneath the condyles; in extreme flexion it is in front of them. These relations are important in judging of a dislocation, but unfortunately most cases are not seen until the swelling is so great that it is impossible to apply them accurately.

When the arm is strongly pronated, the tuberosity of the radius may usually be felt below the joint, in the interval between the radius and the ulna. The shaft of the ulna is much more easily felt than that of the radius.

The front of the joint is so well covered by muscles that but little aid can be obtained from bony landmarks. However, deep pressure at the bottom of the cubital fossa will, in lean individuals, reveal the tip of the coronoid process of the ulna.

Skin.—The skin in front of the elbow is especially thin, delicate, and transparent, the course of the subcutaneous veins being, in the white races, clearly visible through it. It is also readily movable. Because of these peculiarities care must be taken to avoid any considerable traction upon it when apparatus is used in this region, as it is easily excoriated and ruptured.

During flexion there appears in front a transient fold of skin which disappears on complete extension, differing in that respect from the folds of the fingers and palm. It lies some distance above the line of articulation and should not be used as a surgical guide.

Superficial Fascia, Vessels and Nerves (see Fig. 1815).—The subcutaneous fat or superficial fascia varies very much in different individuals. It may be sufficient to conceal the subcutaneous veins and be separable into two sheets between which the veins run. Embedded in it, just above the inner condyle, are a few lymphatic glands which receive the converging, superficial lymphatic trunks arising from a network about the lower arm and hand. These glands should be examined in case of suspected malignant growth in those regions.

The superficial veins at the elbow were formerly much used for the operation of blood-letting or venesection, and are still occasionally resorted to for that purpose. The reason for this choice is obvious. They are easily accessible and situated upon a portion of the body frequently exposed to view. They are also of sufficient size to make the operation effective, which is not usually the case with trunks more distally situated, and, with reasonable care, no untoward results need ensue. The anatomical relations should, however, be carefully studied. Their general course can be effectively shown in the living subject by binding a ligature just above the elbow sufficiently tight to retard the flow of blood in the superficial veins without arresting the current in the brachial artery.

According to the classical description, the superficial veins at the elbow consist of collateral anastomoses between three principal trunks which, running lengthwise up the forearm, are respectively known from their positions as the radial, ulnar, and median veins. Above the elbow the radial and ulnar pass immediately into the two great venous trunks of the upper arm: the cephalic, which runs up in the outer bicipital groove as far as the shoulder, and the basilic, which follows the inner bicipital groove about one-third the way up the arm, pierces the deep fascia at the hiatus semilunaris and joins the venæ comites of the brachial artery. The median vein, however, divides into two short, diverging trunks; one, the median-cephalic, passing to the cephalic trunk; the other, the median-basilic, passing to the basilic. These trunks are of larger calibre than the median, a circumstance that is explained when we find that somewhere near the point of their divergence a short anastomosing vessel, the deep median, perforates the deep fascia and brings them blood from the deep system of veins.

This arrangement is usually compared to a capital M, yet that imperfectly describes it, as the uprights must be extended both upward and downward and an additional member be added at the union of the diverging bars (see Fig. 1815).

The pattern thus sketched out is, however, by no means constantly followed (see Fig. 1816). The median vein is often replaced by a plexus; there may be two or more radial or ulnar veins that unite either above or below the elbow; frequently the radial vein forms the so-called median-cephalic and median-basilic, while an accessory

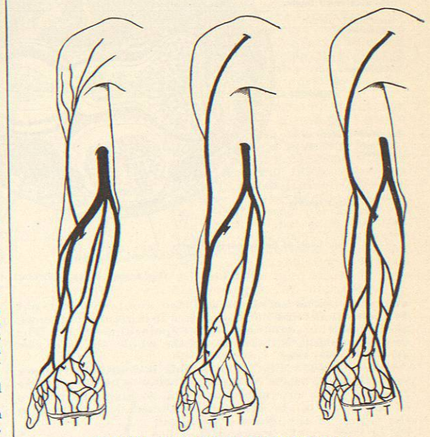

FIG. 1816.—Variation in the Veins of the Arm.

radial constitutes the outer vertical bar of the M. In this case, the median vein, if there is one, discharges either into the radial before it divides or into the ulnar.

The median-basilic, usually larger, more superficial and more constant than the median-cephalic, runs almost parallel with the brachial artery just before its division, being separated from it by the fibrous expansion from the tendon of the biceps to the deep fascia of the lower arm (bicipital fascia, lacertus fibrosus). This gives it a somewhat firmer support when the arm is fully extended than can be afforded to the median cephalic, which is surrounded by yielding subcutaneous fat.

The vessels differ also in their relations to the cutaneous nerves that cross the cubital fossa to supply the lower arm. The internal cutaneous nerve breaks up, at some distance above the elbow, into several branches, the largest of which, piercing the deep fascia at the hiatus semilunaris, usually passes down in front of the basilic and median-basilic, sometimes forming a rich plexus along the latter vessel. On the radial side the cutaneous branches of the musculo-cutaneous nerve emerge from the deep fascia a little above or on a level with the external condyle. This is the most effective spot for its electrical excitation. It lies directly inward from the confluence of the median cephalic with the cephalic. Running along the median cephalic for a short distance, it divides into anterior and posterior branches, which supply corresponding surfaces of the forearm. Both of

these usually descend behind the vessel, though occasionally the anterior branch passes in front.

The larger size and firmer bed of the median basilic make it easier to open, but its close proximity to the

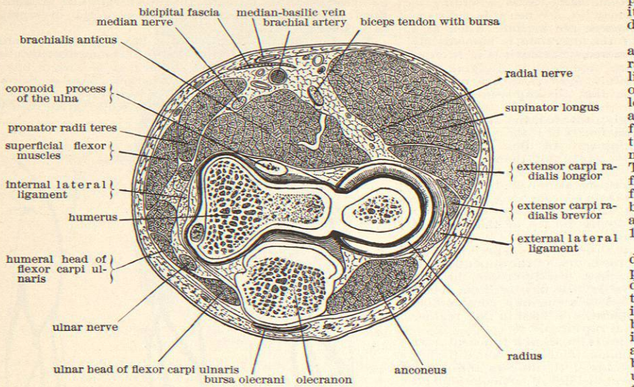

FIG. 1817.—Horizontal Section through Elbow.

artery occasions accidents and the number of nervous filaments that must be cut to reach it is disadvantageous, as their section sometimes leads to painful neuritis. The median cephalic is therefore, on the whole, the safer vessel for venesection.

Deep Fascia.—(Fig. 1815.) This is continuous above with the deep fascia of the arm, below with that of the forearm. The intermuscular septa, so marked a feature of the fascia of the arm, are continued downward into the region of the elbow. The internal septum is the stronger, and lies between the brachialis anticus and the internal head of the triceps, attached to the supracondyloid ridge as far as the internal condyle. It is pierced by the musculo-spiral nerve. The external intermuscular septum is mainly represented in this region by the muscles attached to the external condyloid ridge, viz.: the supinator longus and the extensor carpi radialis longior, which lie between the brachialis anticus and the external head of the triceps.

At the elbow-joint the fascia becomes closely adherent to the muscles, to the condyles, and to the olecranon. It here receives several reinforcements, viz.: from the tendon of the biceps, the fibres passing over toward the inner condyle and the crest of the ulna; from the triceps, by expansions on either side of its tendon of insertion; an anterior fascicle from the internal condyle; a posterior fascicle from the external condyle; and fibres from the posterior border or crest of the ulna. From either condyle it sends down strong intermuscular septa between the muscles that arise therefrom, thus affording them additional areas of insertion. Except where reinforced it is thin, but somewhat thicker on the extensor surface of the arm. The general direction of the fibres of this fascia is circular, girdling the arm, but the fascicles of reinforcement are either longitudinal or oblique. At the point of the cubital fossa it is perforated by the deep median vein.

Muscles.—The muscles about the elbow are arranged somewhat like the links of a chain, the flexors and extensors of the lower arm lying on the anterior and posterior surfaces of the limb, while the pronators and supinators are at the sides. The mass coming down from the upper arm in front is composed of the biceps and the brachialis anticus (see Figs. 1817, 1818, 1819).

At the elbow the biceps develops from its fleshy portion a strong flat tendon that lies at first in the frontal plane, but as it descends into the cubital fossa, twists so that its outer border becomes anterior. Passing deeply between the radius and ulna it is inserted upon the posterior portion of the bicipital tuberosity. A bursa (*B. radio-bicipitalis*) constantly intervenes between the anterior portion of the tuberosity and the tendon, and not infrequently a second bursa (*B. ulno-radialis*) is found between its inner surface and the ulna, lying along the oblique ligament. It is because of the insertion of the tendon near to the posterior surface of the radius that the biceps is enabled powerfully to rotate that bone and thus supinate the hand. Owing to its preponderating influence, the force available for supination is much greater than that

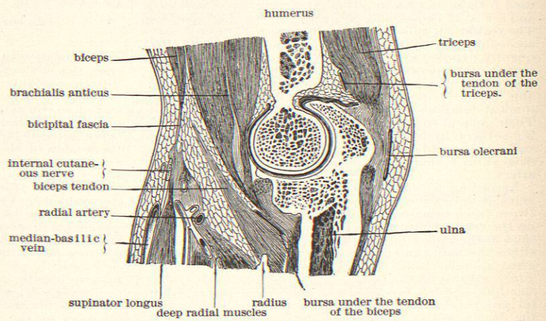

FIG. 1818.—Sagittal Section through Elbow.

for pronation. This is turned to account in many tools and mechanical devices, such as gimlets and screws.

Arising from the anterior surface and inner border of the main tendon of the biceps is the aponeurotic expan-

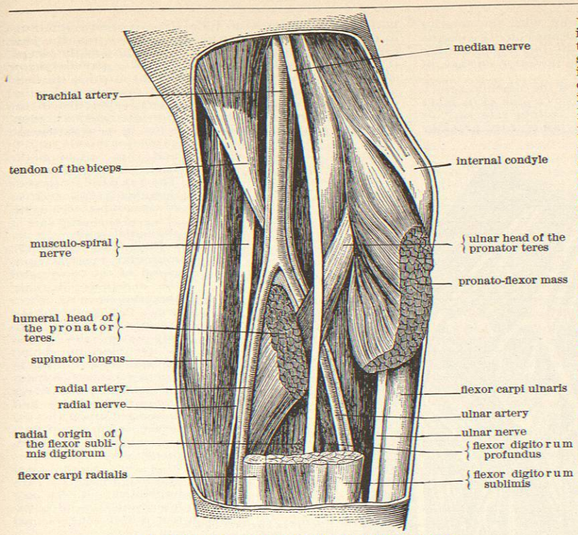

FIG. 1819.—Deep Dissection of the Front of the Elbow.

sion known as the bicipital fascia, also called the fascia semilunaris and the lacertus fibrosus, which is directed obliquely to the inner side of the forearm, its fibres reaching as far as the crest of the ulna. It has therefore been regarded as an ulnar tendon of the biceps. It passes over the brachial artery and the median nerve, separating them from the median basilic vein and the filaments of the internal cutaneous nerve.

The brachialis anticus lies beneath the biceps, directly in front of the elbow-joint. Thick and flat, it arises by direct implantation of muscular fibres from the lower portion of the humerus and the intermuscular septa, and is inserted by a broad, flat tendon upon the tubercle and the inferior surface of the coronoid process of the ulna. Being broader than the biceps, it becomes subcutaneous at the sides of the arm.

In close relation with these muscles there pass down into the cubital fossa the brachial artery with its accompanying veins and the median musculo-spiral nerves (see Figs. 1815, 1817, and 1819). The artery lies upon the brachialis anticus, against the inner side of the biceps muscle, almost exactly midway between the condyles. In this situation the position of the artery is clearly indicated by the broad, glistening white tendon of the biceps on its outer side and the smaller, rounder, and more yellowish cord of the median nerve that runs parallel to its inner border. It usually divides into its terminal branches, the radial and ulnar arteries, just below where the bicipital fascia stretches over it, viz., about a finger's breadth below the bend of the elbow, opposite the junction between the head and the neck of the radius. It is associated with two companion veins that intercommunicate by numerous transverse branches, increasing somewhat the difficulty of isolating the artery for ligation. Its depth and confined position make it possible to compress it by forced flexion of the joint, and hemorrhage from the radial or ulnar arteries may be thus controlled. The bicipital fascia acts as a reinforcement of its outer coat, and this is thought to be one reason why aneurism is much less frequent here than in the popliteal space of the lower limb. It should be noted that the thickness of the bicipital fascia varies much in different individuals, being not infrequently so thin and indistinct that it might be mistaken for ordinary connective tissue.

Collateral branches from the large vessels mentioned above form about the elbow a network (*rete olecrani*) of arterioles important for the nourishment of the region (see Fig. 1820). For this reason tight bandaging is likely to interfere with healing processes in the neighborhood of the elbow. The branches that form this network are, from above, the superior and inferior profunda and the anastomotica magna, derived from the brachial; from below, the radial recurrent, the interosseous recurrent and the anterior and posterior ulnar recurrents. About the external condyle branches from the superior profunda descend, anastomosing with the radial recurrent in front and the interosseous recurrent behind; about the internal condyle the inferior profunda and the

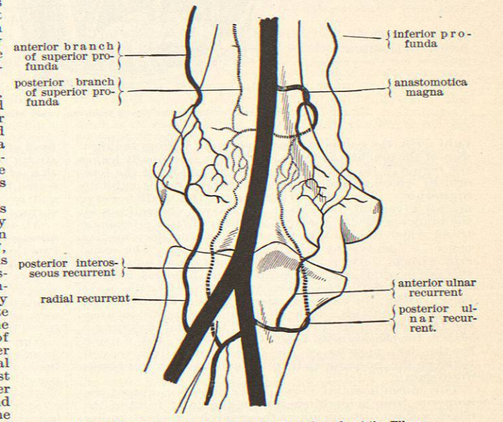

FIG. 1820.—Anastomosis of Arterial Branches about the Elbow.