lowish, highly albuminous serum.* If the blister be unbroken this is present; but if the cuticle be broken evidence of the existence of the blister is found upon the sides and the parts adjacent. The blister produced post mortem usually contains air only, but if its contents are fluid they are not a true serum. The cuticle in such blisters is elevated by the vaporization of the fluids of the tissues beneath it by the heat applied. It is possible in some conditions to produce such blisters immediately after death. Leuret† and Champouillon,‡ succeeded in producing in dropsical subjects, a few hours after death, blisters containing a reddish fluid, slightly albuminous; but such blisters could be distinguished from true blisters produced ante mortem. Wright publishes similar experiences. The experiments of Woodman and Tidy§ lead them to corresponding conclusions, while Chambert, Taylor,‖ Jastrowitz,¶ and others conclude that, while blisters having fluid contents can sometimes be produced within twenty-four hours after death, such blisters lack the essential features characteristic of those produced during life. An extended series of experiments, in this direction, has led the writer to adopt the conclusion that *a true blister cannot be produced post mortem.*

A more important anatomical feature of the burn than the blister is the condition of the skin surrounding the burn. The skin of the burned part appears dry and parchment-like, of a dusky red color, and is surrounded by an area of grayish-white skin bounded by a deeply marked *red line.* The general redness of the burn is transient, disappearing under pressure, but the *red line is permanent* and does not disappear under pressure, and remains after death. This *line of redness* is developed during life, and is essentially a vital process, thus becoming of great significance from a medico-legal point of view.**

Vesication and the formation of the *line of redness* are vital processes, requiring time for their development; yet the absence of these conditions requires a most careful scrutiny of the circumstances attending the burning, as to the existence of shock or profound insensibility, before the adoption of a decision that the burns noted are post mortem.

In cases of multiple burns upon the same body, the question of simultaneous production can be decided by the presence of the same symptoms in all.

Spectroscopic investigation of the condition of the blood in burns thus far has failed to develop constant or purely characteristic appearances. Lack of uniformity in changes noted, in such examinations, and the limited series recorded have not yielded sufficiently positive results upon which to decide questions which may arise.††

Some of the spectroscopic analyses of the blood, in such cases, have shown the presence of dark bands in the spectrum, not encountered in that of normal blood; such bands, however, have not been uniformly noted. Many modifying considerations must be entertained in such examinations, such as the differing intensity of the heat, the length of exposure to it, as well as other elements of variation.

Wertheim‡‡ calls attention to the increased number of leucocytes and the presence of melanin and hæmoglobin. With these observations, those of Hoppe-Seyler agree. Ponfik, §§ on the contrary, is doubtful of the constant presence or the significance of these conditions. Seliger and others have noted appearances similar to those described by Wertheim.

The bright color of the blood observed by Falk ‖‖ and others is contrary to that noted by some observers who have described it as being of a dark, venous hue. These differing conditions may, in some cases at least, be explained by the mode of death. When the fatal issue has resulted from suffocation, caused by the deprivation of oxygen and by the respiration of the products of combustion, the color of the blood would be dark or venous; while in case of death by apnœa, induced by an atmosphere containing an excess of carbon monoxide, the color of the blood would probably be bright or arterial.

Spontaneous Combustion.—The possibility of the occurrence of "spontaneous combustion" of the human body has been occasionally discussed, and a number of cases have been popularly reported. Its serious consideration here, as a scientific fact, is not entertained. The term "spontaneous combustion" is a misnomer. The burning of the body cannot be accomplished without contact with fire.

The possibility of an "increased combustibility" of the human body, under certain conditions, has been recently maintained, and that, under such circumstances, the application of flame causes its rapid combustion. Dr. Hava, of New Orleans, has urged the existence of such a condition.* His experiments on animals and one or two cases observed in the human subject, apparently sustaining his position, have led him to claim the possibility of "an increased combustibility" of the human body, as the result of a gradual, progressive, and constant accumulation of carbon monoxide for many years, and its consequently rapid combustion on exposure to flame.

Enoch Vine Stoddard.

BURSÆ, LIST OF.—A knowledge of the exact location of bursæ is of great importance with reference to diagnosis. Unfortunately the subject has been somewhat neglected by descriptive anatomists. While some bursæ have received names and are accurately described, others are but seldom mentioned, and authors differ as to their nomenclature. In the following list, which has been carefully compiled from various sources, an endeavor has been made to describe and name all the bursæ which have been found in the human body, omitting only those which are merely accidental. The figures show the situation of the principal bursæ in the most important surgical regions.

HEAD.—*Bursa galeæ capitis.* Between the aponeurosis of the occipito-frontalis and the pericranium, directly over the occipital protuberance.[1] Only in aged subjects.

B. sacculi lachrymalis. Between the lachrymal sac and the internal palpebral ligament.[2] Rare.

B. trochlearis oculi. In the pulley of the superior oblique. Constant.

B. capsulæ oculi. Between the capsule of Tenon and the globe of the eye. Usually imperfect. Hyrtl[3] cites cases of effusion into the sac.

B. circumflexi palati (Rosenmüller). Where the tendon of the tensor palati turns around the hamular process.

Bursæ masstericæ. There appear to be several bursæ between the masseter and the subjacent structures. Rosenmüller mentions one between the two portions of the masseter, and one between the masseter and the external pterygoid. Hyrtl[4] mentions one between the muscle and the temporo-maxillary articulation. Nancrede supposes that these may become continuous, and when inflamed form a cystic tumor reaching to the base of the skull.

B. spinæ sphenoideæ. Hyrtl[5] states that when the temporo-maxillary joint is unusually large a bursa occurs between the spine of the sphenoid and the joint capsule.

B. anguli mandibuli. Subcutaneous over angle of the jaw. Rather rare.

B. sublingualis. Between the tongue and the mucous membrane, outside the genio-glossus. Frequently called Fleischmann's bursa, from its discoverer.[6] Some deny its existence.[7] Tillaux has frequently found it, and believes that acute ranula is caused by a rupture of Wharton's duct into it.[8]

B. præmentalis (Fig. 1060). Subcutaneous at lower border of the symphysis of the chin. Quite constant.[9]

NECK.—*B. digastrici posterior* (Rosenmüller). Between the posterior belly of the digastric and the sterno-mastoid.

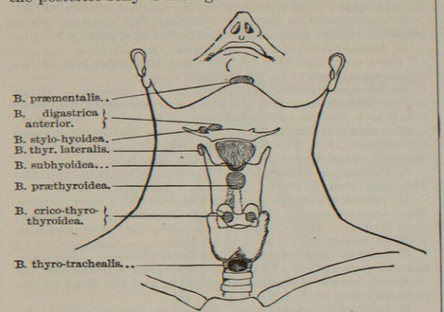

FIG. 1060.—The Principal Bursæ of the Neck, in Front.

B. digastrici anterior (Rosenmüller) (Fig. 1060). Where the tendon of the digastric passes through the fascia binding it to the hyoid bone, or through the stylo-hyoid muscle.

B. stylo-hyoidea (Fig. 1060). Under the insertion of the stylo-hyoid and the hyoid bone.

B. suprahyoidea (Verneuil). Between the upper surface of the hyoid bone and the genio-hyo-glossi. Rare.

B. subhyoidea (Fig. 1060). Between the hyoid bone + combined insertion of sterno-hyoid, omo-hyoid, and stylo-hyoid muscles, and the thyro-hyoid membrane. Larger in men than in women. Often called Boyer's bursa.

B. sterno-hyoidea (Rosenmüller). Between the insertion of the sterno-hyoid and the hyoid bone.[10]

B. præthyroidea (Fig. 1060). Between the skin and the upper part of the thyroid cartilage in old subjects. Often wanting.

B. thyroidea lateralis (Gruber[11]) (Fig. 1060). Between the inferior constrictor and the greater cornu of the thyroid cartilage. Found in five cases out of fifty.

B. crico-thyro-thyroidea (Calori[12]) (Fig. 1060). Between the lateral lobes of the thyroid body and the crico-thyroid.

B. thyro-trachealis (Calori) (Fig. 1060). Between the isthmus of the thyroid body and the trachea. Usually single and median; there may be one on either side. Most common when the pyramid of the thyroid body is well developed, especially when it is attached to the hyoid bone.

B. musculi thyroidei. Between the levator thyroidei, when that muscle is present, and the thyroid body. Calori figures one in a case of goitre.

B. omo-hyoidei. Between the sterno-mastoid and the middle tendon of the omo-hyoid. Mentioned by Nancrede, but not generally noticed by authors.

Bb. aortico-tracheales (Calori). Between the aorta and the trachea. A large one extends from the origin of the innominate to the left carotid, and from the upper border of the arch to the bifurcation of the trachea. A second one is described as posterior to this, also a small one which extends between the left carotid and the trachea. Some one of these was found in thirteen out of forty examinations. If the pericardium extends upward, the large aortico-tracheal bursa is small.

B. vertebræ prominentis. Between the skin and the spinous process of the seventh cervical vertebra. Nancrede states that this is quite large, and may inflame from pressure of a heavy overcoat.

TRUNK.—*B. subclavia* (Rosenmüller). Within the fibres of the rhomboid ligament.[13] Not constant. May simulate a costo-clavicular articulation, of which, indeed, it seems to be the beginning.

B. submammaria. Between the mammary gland and the pectoralis major. Rare, but interesting, as it may be involved in a case of mammary abscess.

B. anguli sterni. Subcutaneous over the angle between the first and second pieces of the sternum. In carpenters and cabinetmakers.

B. hyper-xiphoidea. Subcutaneous over xiphoid cartilage. Usual in shoemakers and rachitic children.

B. suprapubica. Beneath the pubic attachment of the rectus abdominis. Duval[14] reports that inflammation of this has been known to occur as a sequel to croupous pneumonia. Not mentioned by authorities generally. Schreger mentions a subcutaneous bursa at the side of the suspensory ligament of the penis.

B. costæ primæ. Between the muscles of the back and the tuberosity of the first rib. Mentioned by Nancrede. It is probably rare, as the principal authorities omit it.

B. sacralis (Luschka). Over spinous process of fourth or fifth sacral vertebra, or over the articulation of the sacrum and coccyx. Usual in old subjects.

B. coccygea (Luschka). Between tip of coccyx and sphincter ani. Common.[15]

B. phrenico-hepatica anterior (von Brunn[16]). Between the left lateral ligament of the liver and the under surface of the diaphragm in front. Found in 31 cases out of 64. Its enlargement might simulate a diaphragmatic hernia.

B. phrenico-hepatica posterior (von Brunn). Between the same structures behind. Found in 2 cases out of 64.

SHOULDER.—*B. trapezii.* Between the aponeurotic part of the trapezius and the base of scapular spine (3 times in 12, Synnestvedt).

B. latissimi dorsi. Between the latissimus dorsi and the inferior angle of the scapula. Recent observers (Henle, Heineke, Synnestvedt) do not find this.

B. spinæ scapulæ;

B. supracromialis. These are subcutaneous, found in those who carry burdens.

B. infrascapularis. Between the inferior angle of the scapula and the chest wall. Usually between subscapularis and serratus magnus. May be of considerable size, and by crepitation, when inflamed, simulate crepitant râles or pleuritic fremitus.[17]

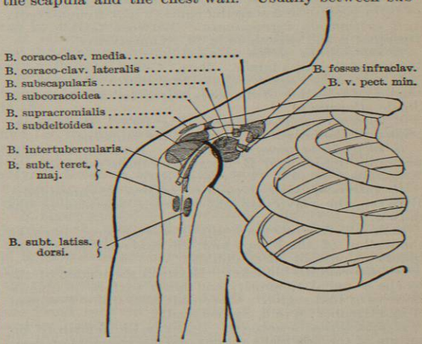

FIG. 1061.—The Principal Bursæ about the Shoulder.

B. subdeltoidea (Fig. 1061). Between the under surface

* Kossack: Friederich's Blätt. f. gericht. Med., 1877, Heft iii., 210.
† Annales d'hygiène, 1835, ii., 387.
‡ Annales d'hygiène, 1846, i., 320.
§ "Forensic Medicine," 1877, p. 886.
‖ "Medical Jurisprudence," Am. ed., 1880, p. 408.
¶ Vierteljahrsch. f. gericht. Med., Bd. xxxvi., Heft i., 1880.
** Casper: "Forensic Medicine," iv., 299.
†† Schjerning-Eulenberg's Vierteljahrs. f. gericht. Med., xli., 44.
‡‡ Wien. med. Presse, 1868, pp. 309-605.
§§ Berliner klinische Wochenschrift, 1876, No. 17; 1877, No. 46.
‖‖ "Die Verbrennungen und Verbrühungen."

* The New Orleans Medical and Surgical Journal, April, 1894.

of the acromion + structures arising therefrom (lateral portion of coraco-acromial ligament, deltoid muscle) and the capsular ligament of the shoulder joint.[18] Constant. Many authors describe the upper part of this bursa separately as *B. subacromialis*. This portion may be separate, but it usually communicates, and the whole should be considered as a single large multilocular bursa. Rarely communicates with the joint. Its inflammation may simulate dislocation of the biceps tendon (Nancrede).

B. coraco-brachialis (Monro). Between the lateral part of the subscapularis and the short head of the biceps + coraco-brachialis. Sometimes communicates freely with B. subdeltoidea. Also known as B. subcoracoidea.

B. coraco-brachialis minor (Gruber). Under a rare muscle, which arises from the anterior and internal part of the coracoid process.

B. fossæ infraclavicularis (Gruber) (Fig. 1061). Between two layers of the coraco-clavicular fascia (costo-coracoid membrane), in front of the coracoid process. Frequent (1 in 3), more common in women.

B. coraco-clavicularis media (Gruber) (Fig. 1061). Between the conoid and the trapezoid ligaments. Frequent (1 in 2). May simulate a coraco-clavicular articulation.

B. coraco-clavicularis lateralis (Gruber) (Fig. 1061). Between the coracoid process and the trapezoid ligament. Occasional (1 in 5).

B. subtendinea pectoralis minoris. Under insertion of pectoralis minor. Rare (1 in 30 or 40, Gruber).

B. vaginalis pectoralis minoris (Gruber) (Fig. 1061). Around tendon of pectoralis minor. Rare (1 in 10).

B. subscapularis (Fig. 1061). Between the subscapularis and the neck of the scapula. Constant. It always communicates with the joint, and may properly be considered as a diverticulum of the capsule.

B. subcoracoidea (Gruber) (Fig. 1061). Between the upper edge of the subscapularis and the B. subscapularis.[19] Found 10 out of 12 times (Synnestvedt); in two of these cases it communicated with B. subscapularis.

B. subtendinea subscapularis (Synnestvedt). Between the tendon of the subscapularis and the capsule (2 times in 18).

B. intertubercularis (Henle[20]) (Fig. 1061). Surrounding the tendon of the long head of the biceps in the groove of the humerus. Constant. Always communicates with joint cavity, and should be considered as a diverticulum of the capsule.

B. infraspinata (Rosenmüller). Between upper edge of infraspinatus and scapular spine (2 in 3, Synnestvedt).

B. subtendinea infraspinata. Between tendon of infraspinatus and capsule (4 in 14, Synnestvedt).

B. subtendinea teretis minoris (Gruber). Under the tendon of the teres minor. Rare.

B. subtendinea teretis majoris (Fig. 1061). Between the tendon of insertion of the teres major and the latissimus dorsi. Constant.

B. subtendinea latissimi dorsi (Fig. 1061.) Between the tendon of the latissimus dorsi and the humerus.

B. subtendinea pectoralis majoris. Between tendon of pectoralis major and B. intertubercularis + tendon of latissimus dorsi (4 in 12, Synnestvedt).

B. intermuscularis pectoralis majoris (Synnestvedt). Between the clavicular and thoracic portions of the muscle.

Elbow.—*B. radio-bicipitalis* (Rosenmüller). Between the tendon of the biceps and the inner surface of the radius. Constant, often double.

B. ulno-radialis (Jancke). Between the tendon of the biceps + radial tuberosity and outer surface of ulna + muscles of that region. Of considerable size. Frequent (1 in 4, Gruber; 3 in 6, Synnestvedt).

B. subtendinea brachialis. Between the tendon of insertion of the brachialis anticus and the coronoid process. Rare. The older anatomists (Fourcroy, Jancke, Koch) describe a bursa between the brachialis anticus and the interosseous ligament.

B. flexoris digitorum sublimis (Gruber). In the tendon of origin of the flexor sublimis, or between it and the pronator radii teres. Very rare (1 in 200).

B. palmaris longi. Between the origin of the muscle and the joint capsule. Very rare.

B. subcutanea olecrani (Camper). Between the skin and the periosteum of the olecranon. Constant in adults.

B. subtendinea olecrani. Above the olecranon, and in front or at the side of the triceps tendon. Frequent (3 in 5); constant in old subjects.

B. intratendinea olecrani. Within the tendon of the triceps. Quite frequent (7 in 12, Synnestvedt).

B. humero-tricipitalis. Between the anterior surface of the triceps and the fat covering the lower end of the humerus. Rare (1 in 12, Synnestvedt).

B. retro-epitrochlearis. Between the triceps + ulnar nerve behind, and the posterior surface of the internal condyle + median surface of capsule in front. Very rare.

B. anconei (Rosenmüller). Between the anconeus and the capsule (1 in 4 or 5). May communicate with B. extensoris carpi ulnaris or with joint (Henle).

B. epicondyli (Schreger). Between the skin and the external condyle of the humerus. Rare (1 in 60).

B. extensoris carpi ulnaris (Jancke). Under origin. May extend under the extensor communis. Frequent (1 in 3 or 4). May communicate with the joint and also with B. anconei.

B. extensoris carpi radialis brevioris (Monro). Between the common origin of the extensor carpi radialis brevior + the extensor communis digitorum and the head of the radius (1 in 6 or 7).

B. epitrochlei (Schreger). Between the skin and the inner condyle of the humerus. Rather frequent (1 in 5).

Wrist and Hand.—*B. ulnaris subcutanea.* Over styloid process of ulna. Not constant (3 in 11, Synnestvedt).

B. radialis subcutanea. Over styloid process of radius. Rather rare.

B. dorsalis carpiea subcutanea. Schreger found this in 2 cases.

B. vaginalis extensoris carpi ulnaris (Fig. 1062). A small sheath. Reaches to the base of metacarpale V.

B. v. extensoris minimi digiti (Fig. 1062). A small and separate sheath.

B. v. extensorum communis et indicis (Fig. 1062). Large. Extends farther toward the fingers on the ulnar side.

B. v. extensoris longi pollicis (Fig. 1062). Runs obliquely across the next.

B. v. extensorum carpi radialorum (Fig. 1062). In groove on back of radius. Single above, divides below.

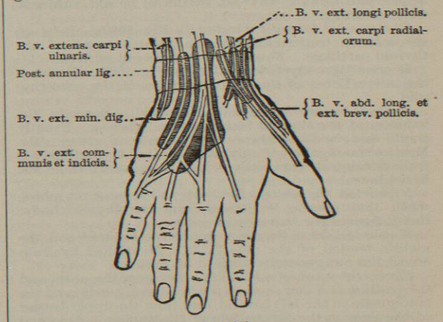

Fig. 1062.

B. subtendinea extensoris carpi radialis longioris. Under the tendon at its insertion into metacarpale II. (4 in 20, Synnestvedt).

B. subtendinea extensoris carpi radialis brevioris. Under the tendon at its insertion into metacarpale III. (18 in 20, Synnestvedt).

B. vaginalis abductoris longi et extensoris brevis pollicis (Fig. 537).—Surrounds these tendons from the dorsal surface of the radius to the outer edge of the wrist.

B. subtendinea flexoris carpi ulnaris (Fig. 1063). Under the tendon at its insertion into pisiform (6 in 30 Synnestvedt).

B. tendinosa ulnaris (Michon) (Fig. 1063). The usual arrangement of this extensive sheath is to surround the tendons of both the superficial and deep flexors as they

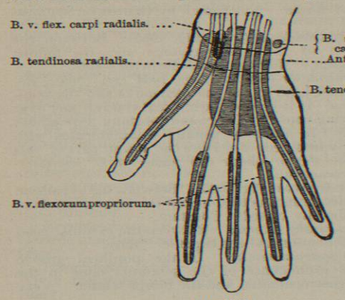

Fig. 1063.

lie in the wrist and palm, sending a diverticulum downward upon the tendons of the little finger. Schüller[21] describes this bursa as double, the sheath for the tendons of digits IV. and V. being separate from those of digits II. and III. Holden[22] reports a case in which this bursa communicated with the wrist joint. It does not usually communicate with the radial bursa,[23] but many varieties are found.[24]

B. vaginalis flexoris carpi radialis (Fig. 1063). In the groove of the trapezium.

B. tendinosa radialis (Michon) (Fig. 1063). Extends from an inch above the anterior annular ligament to the base of the second phalanx of the thumb, upon the tendon of the flexor longus pollicis.

Bb. dorsales subcutaneæ. Between the skin and the extensor tendons on the ulnar side over the metacarpo-phalangeal joint (Synnestvedt found them in digit I., 40 per cent.; digit II., 53 per cent.; digits III. and IV., 66 per cent.; digit V., 27 per cent.).

Bb. dorsales subtendineæ.—Between the tendons and the capsules of the metacarpo-phalangeal joints. Quite constant. Frequently communicate with joint. When not found a diverticulum of capsule takes the place (Theile, Synnestvedt).

Bb. volares articuli-metacarpo-phalangei. Between the skin + subcutaneous fat and the flexor tendon with its fibrous sheath. Found by Schreger in all the digits, by Synnestvedt only in digits I., II., and III.; most frequent in digit III.

Bb. volares phalangis primæ. Between the skin and subcutaneous tissue and the flexor tendon with its sheath in front of the first phalanx. Found by Synnestvedt in but two instances, in digit II. and digit III.

Bb. vaginales flexorum propriorum (Fig. 1063). Special sheaths for the flexor tendons of digits II., III., and IV.

Bb. intermetacarpo-phalangea. Between the heads of metacarpales II., III., IV., and V.

Bb. interossea. Between the tendons of the interossei muscles and the metacarpo-phalangeal joints. Gruber[25] finds two sets of these, one under the part of the tendon that extends to the dorsal aponeurosis, the other under the part which communicates with the phalanx.

B. metacarpea ulnaris (Synnestvedt). Between the skin and the head of the fifth metacarpal. Found in 8 out of 15 cases.

Bb. phalangea dorsales. Over the articulations. Quite constant over the first series; less so over the second.

Hip.—*B. iliaca anterior.* Subcutaneous over the anterior superior spine of the ilium.

B. subiliaca (Hyrtl). Under the tendon of the ilio-psoas, covering the ilio-pectineal tubercle, the anterior surface of the pubis, and the capsule of the hip joint. This large and constant bursa is sometimes multilocular and frequently (6 in 14, Synnestvedt) communicates with the hip joint.

B. subtendinea iliaci. Between the tendon of insertion of the ilio-psoas and the femur. Not constant.

B. subtendinea pectinei. Between the insertion of the pectineus and the femur + lowest fascicles of the iliacus. Frequent (8 in 14, Synnestvedt).

B. trochanterica superficialis. Subcutaneous over the trochanter major. Usually small, but sometimes multilocular. Rather frequent (4 in 13, Synnestvedt).

B. trochanterica profunda. Between the tendon of the gluteus maximus and the posterior and external portions of the great trochanter. Large and constant; frequently multilocular.

Bb. gluteo-femorales. One or more between the tendon of the gluteus maximus and the femur. Quite constant.

B. gluteo-fascialis. Between the tendon of the gluteus maximus and the origin of the vastus internus. Constant.

B. glutei medii anterior. Between the anterior portion of the tendon of the gluteus medius and the great trochanter. Nearly constant (12 in 15, Synnestvedt).

B. glutei medii posterior. Between the posterior portion of the tendon of the gluteus medius and the pyriformis. Usual (10 in 15, Synnestvedt).

B. glutei minimi. Between the gluteus minimus and the anterior surface of the great trochanter. Large and nearly constant (14 in 15, Synnestvedt).

B. supra-acetabularis. Between the reflected tendon of the rectus and the upper edge of the acetabulum (5 in 16, Synnestvedt).

B. pyriformis. Under the distal insertion of the muscle Infrequent (3 in 12, Synnestvedt).

B. gemellorum (Synnestvedt). Between the gemelli and the joint capsule. Found once only. It communicated with B. circumflexa.

B. ovalis obturatoris interni. Between the tendon of the obturator and the gemelli. Rather frequent (5 in 13, Synnestvedt). Communicates sometimes with B. circumflexa.

B. circumflexa obturatoris interni. Between the muscle and the lesser sciatic notch.

B. subtendinea obturatoris interni. Between the tendon and the capsule of the hip joint. Rare. May communicate with last (Quain).

B. obturatoris externi (Synnestvedt). Between the obturator externus and the joint capsule. Infrequent (2 in 18).

B. quadrati femoris. Between the quadratus femoris and the trochanter minor + tendon of ilio-psoas. Constant.

B. subcutanea tuberis ischii. This is described by some (Hyrtl, Nélaton) as directly under the skin over the tuberosity of the ischium. It is probably rare. The three following are often mistaken for it:

B. musculi glutei in tubere ischii. Between the lower border of the gluteus maximus and the tuberosity of the ischium (5 in 12, Synnestvedt.)

B. semitendinoso-bicipitalis in tubere ischii. Between the tendon of the united semitendinosus and biceps and the tuberosity. Constant.

Bb. semimembranosæ in tubere ischii. Two of these are found between the tendon of the semimembranosus and the quadratus femoris. One is quite constant (9 in 12), the other infrequent (2 in 12, Synnestvedt).

B. iliaca posterior. Subcutaneous over the posterior superior spine of the ilium.

Knee.—*B. condyli interni;*

B. condyli externi. Subcutaneous bursæ over the projecting condyles (Figs. 1064 and 1065).

B. præpatellaris subcutanea (Fig. 1064). In the sub-

cutaneous connective tissue in front of the patella. This is quite common (18 in 20, Synnestvedt; 165 in 400, Gruber), and is usually confounded with the next. It may be of considerable size.

B. præpatellaris subfascialis. Between the fascia in front of the patella and the aponeurosis of the extensors. Not so frequent (9 in 20, Synnestvedt; 23 in 400, Gruber).

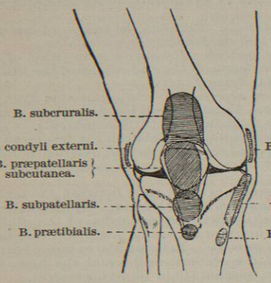

FIG. 1064.—The Principal Bursæ in Front of the Knee.

B. præpatellaris subaponeurotica. Between the aponeurosis and the anterior surface of the patella. Found in 9 out of 20, Synnestvedt; 23 in 400, Gruber; 10 out of 12, Schreger. This division of the præpatellar bursæ is that of Gruber. The three here described rarely coexist, and when they do, they usually communicate.

B. subcruralis (Fig. 1064). Between the tendon of the extensor quadriceps and the lower part of the anterior surface of the femur above the patella. This is always present, and invariably communicates with the joint, except occasionally in very young children.

B. intermuscularis extensoris cruris. Between the tendons of rectus and the cruræus. About an inch above the patella. Rare (2 in 55, Synnestvedt).

B. patellaris externa. Between lateral expansions of the tendons of the quadriceps femoris and the patella. Rare.

B. patellaris lateralis interna. In a similar situation on the inner side. Synnestvedt mentions two varieties, one superficial and one deeper.

B. præligamentosa. Between the fascia and the ligamentum patellæ. (Found by Synnestvedt in 6 out of 15.)

B. prætibialis (Fig. 1064). Between the fascia and the tuberosity of the tibia. Usual in old subjects.

B. subpatellaris (Fig. 1064). Between the ligamentum patellæ and the anterior surface of the tibia. Constant and large. May occasionally communicate with the joint, though Synnestvedt has never seen this, and thinks the reported cases erroneous.

B. subtendinea sartorii. Between the tendon of the sartorius and the internal condyle of the femur. Rather rare (2 in 15, Synnestvedt).

B. sub ligamento interno (Synnestvedt). Between the internal lateral ligament and the capsule (11 out of 21).

B. tibialis interna (Fig. 1064). Between the expansion of the lower internal ham-string tendons (semitendinosus, gracilis, sartorius), and the long internal lateral ligament.[26] Constant. It occasionally blends with B. gastrocnemialis interna, and through that communicates with the joint.

B. tibialis subcutanea (Schreger). Subcutaneous over upper end of tibia. Not found by Gruber or Synnestvedt.

B. tendinis poplitei. Between the external lateral ligament and the tendon of the popliteus. Not constant (5 in 16, Synnestvedt). Occasionally communicates with joint.

B. tendinis bicipitis (Fig. 540). Between the external lateral ligament and the tendon of the biceps. Nearly constant (21 in 26, Synnestvedt; 191 in 200, Gruber). It occasionally communicates with the joint. The external popliteal nerve is in relation to it.

B. subtendinea tensoris fasciæ latæ (Synnestvedt). Between the ilio-tibial band and the capsule. Found in 3 out of 19, once communicating with joint.

B. fibularis subcutanea (Schreger). Subcutaneous over upper end of fibula. Not found by Gruber or Synnestvedt.

B. supracondyloidea interna (Fig. 1065). Between the inner tendon of the gastrocnemius and the femur. Nearly constant. May communicate with joint.

B. gastrocnemialis interna (Figs. 1064 and 1065). Between the inner head of the gastrocnemius and the semimembranosus. It is behind the internal condyle and over the neighboring capsule. Large and constant. Sometimes multilocular. In adults it usually communicates with the joint. Synnestvedt describes the lower part of this as a separate bursa, under the name of *B. semimembranoso-gastrocnemialis.*

B. semimembranosa (Fig. 1065). Between the expansion of the semimembranosus tendon and the inner condyle of the tibia. Usually closed. Constant.

B. gastrocnemialis externa. Between the external head of the gastrocnemius and the capsule. Rare.

B. bicipito-gastrocnemialis. In the popliteal groove between the prominence of the sesamoid bone in the head of the gastrocnemius and the biceps tendon. Very rare.

B. poplitea (Fig. 1065). Between the popliteus and the joint capsule + external tuberosity of tibia. This always communicates with the joint, and is properly a diverticulum of the capsule, occasionally (1 in 10, Lenoir) it also communicates with the cavity of the superior tibio-fibular articulation.

ANKLE AND FOOT.—*B. malleoli externa ;*

B. malleoli interna. Subcutaneous over the malleoli. Not constant. External more frequent.

B. vaginalis extensoris longi digitorum ;

B. v. extensoris longi hallucis ;

B. v. tibialis antici (Fig. 1066). Around the tendons of these muscles. Not infrequently the sheath of the ex-

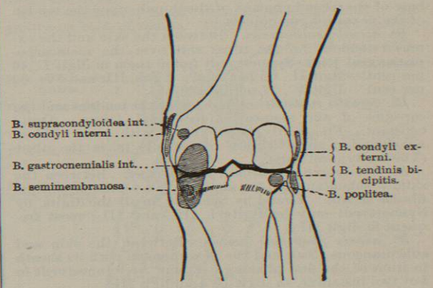

FIG. 1065.—The Principal Bursæ Behind the Knee.

tensors extends somewhat higher up than is shown in the figure.

B. sinus tarsi (Gruber). Between the fascia which binds down the extensor longus digitorum and the head of the astragalus. Quite frequent (5 in 12, Synnestvedt; 97 in 174, Gruber). May communicate with joint.

Bb. sub musculo pedæo. Under the extensor brevis digitorum. Usually two. Found by Synnestvedt 2 in 16.

B. tarsiea subcutanea (Schreger). On dorsal surface of foot.

B. vaginalis tibialis postici (Fig. 1067). Surrounds the tendon as it lies back of the internal malleolus.

B. v. flexoris longi digitorum ;

B. v. flexoris longi hallucis (Fig. 1067). Surround the tendons behind the internal malleolus and extend into the sole.

B. postcalcanea superficialis. Between the tendon and the deep fascia. Not constant.

B. postcalcanea profunda (Fig. 1067). Between the tendon and the posterior surface of the calcaneum. Constant. Has cartilage on two of its walls, viz., over the bone, and a thin layer coating the anterior surface of the tendon.

B. subcalcanea (Lenoir[27]). Between the inferior surface of the calcaneum and the plantar fascia. Constant.

B. subtendinea tibialis antici (Fig. 1066). Under the tendon at its insertion upon cuneiforme I. (5 in 12, Synnestvedt).

Bb. abductoris minimi digiti (Synnestvedt). One between the abductor and the sesamoid bone of the peroneus longus; another between the muscle and the tuberosity of metacarpale V. Rare.

B. subtendinea peronei tertii (Hyrtl) (Fig. 1066). Under the tendon at its insertion upon head of metacarpale V. Not constant.

B. subtendinea extensoris longi hallucis. Between the tendon and the head of metacarpale I. Small and rather rare.

B. vaginalis anterior extensoris longi hallucis (Fig. 1066). Over metatarso-phalangeal joint I. About one inch long.

B. v. peronei. Sheathes the peroneal tendons behind the external malleolus. Single in the middle, it divides above and below.

Bb. dorsales subcutaneæ. Several of these are described by Schreger and Synnestvedt. One over cuneiforme I., one over head of metacarpale I., and occasionally over other projections.

Bb. dorsales subtendineæ (Synnestvedt). These occur in similar situations as those of the hand, and agree with them in form and size.

B. vaginalis peronei longi. Sheathes the tendon as it lies in the groove of the cuboid. A small bursa is some-

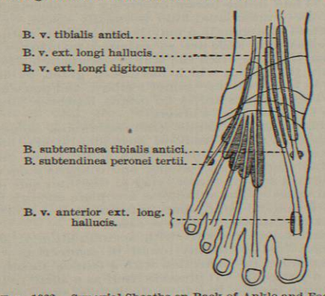

FIG. 1066.—Synovial Sheaths on Back of Ankle and Foot.

times found under the tendon where it turns around the outer side of the cuboid, and another under its insertion upon metatarsale I.

Bb. plantaris metatarso-phalangei (Schreger). These occur at the articulations.

B. plantaris in capitulo ossis metatarsi I. (Lenoir);

B. plantaris in capitulo ossis metatarsi V. (Lenoir). These are well-known bursæ between the skin and the points of greatest pressure.

Bb. intermetatarso-phalangeæ. These are usually found in old subjects, between the toes, in the region of the metatarso-phalangeal joints. The three inner are most constant (No. 1, 95 per cent.; No. 2, 98 per cent.; No. 3, 95 per cent.; No. 4, 28 per cent., Gruber). Occasionally communicate with joints.

Bb. interossea. Between the interossei and the metatarso-phalangeal joint. Rarely communicate.

Bb. lumbricalium. Under the lumbricales and laterally to them. Rare.

B. abductoris minimi digiti. Between the abductor of

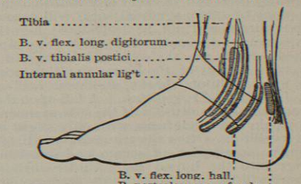

FIG. 1067.—Synovial Sheaths of Inner Side of Foot.

the little toe and the head of metatarsale V. Rare (1 in 14, Synnestvedt).

Bb. phalangea dorsales (Schreger). These are not so constant as those of the hand.

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