severe cases closely resembling infectious arthritis. The synovial membrane is especially affected, granulation tissue is often abundant, and ankylosis is very apt to result.

Neuropathic Arthritis.—In some cases acute inflammation of the finger joints appears to result from nervous influences. Marked trophic alterations of these joints may occur, of nervous origin, as in Charcot's tabetic arthropathy and in syringomyelia.

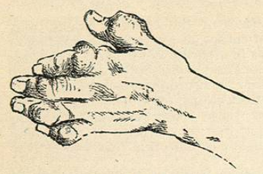

FIG. 2491.—Gouty Hand. (Meillet and Richer.)

Rheumatic Arthritis (acute and subacute) affects by preference the large joints of the body, among them the wrist; but exceptionally the small finger joints are the seat of articular rheumatism.

Chronic Rheumatism includes a rather indefinite class of cases which in their clinical features merge into or are sometimes difficult to differentiate from arthritis deformans. It occurs independently, or as a sequel of acute rheumatism. It is manifested by thickening of the fibrous structures of the joint, enlargement of the joint, stiffness, ankylosis (fibrous), ulnar deflection of the fingers, chronic synovitis, pain, slight creakiness of the joints. The finger joints may suffer from this condition, though the large joints are its more usual seats.

The treatment of the various inflammatory, infectious, gouty, and rheumatoid affections of the joints of the hand is the same as that of these forms of arthritis or constitutional disease in general. Simple inflammations require rest, sedatives, counterirritants, etc.; suppurating joints should be drained; rheumatism demands the appropriate local and systemic treatment.

Gout.—Next to certain joints of the foot, the joints of the fingers are the most common seats of gouty lesions. These consist of deposits of urates, at first in the articular cartilages, then in the synovial and fibrous structures of the joint, then in the tissues surrounding the joint. These deposits, when in sufficient amount, constitute "tophi" or "chalk stones," and produce characteristic nodular enlargements about the affected finger joints. The mobility of the joints may be impaired. At times the tophi may ulcerate out, or may cause damage to the articulation itself. Urates may be also deposited in the cutaneous or subcutaneous tissues of the palm, or in the tendinous structures. The treatment is that of gout in general.

Arthritis Deformans.—Under this designation is included a group of conditions which, while somewhat distinct in their clinical features, present common characteristics in the nature of the joint lesions. The finger joints are favorite seats for the different varieties of arthritis deformans, though other joints, especially the knees, are also subject to the disease. The characteristic pathological features of the lesions in these cases consist primarily in a proliferation of the cartilaginous structures of the joint. The central portions of these softened cartilages, exposed to pressure and friction, become eroded, leaving the bone bare; the exposed bone then becomes hardened or "eburnated." The marginal portions of the hyperplastic cartilages grow out into nodular masses about the margin of the joint; these outgrowths —"osteophytes"—become ossified. The ligamentous structures become thickened, subperiosteal bone formation is active, the muscles in the vicinity become atrophied. From the altered conformation of the ends of the bones deflections of the phalanges are brought about; the osteophytes limit the motion of the joint or may render it entirely immovable; the naked bony surfaces crepitate roughly.

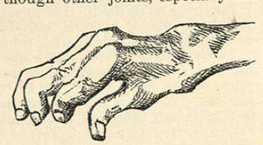

FIG. 2492.—Arthritis Deformans. (Meillet and Richer.)

The manifestations of rheumatoid arthropathy in the hand vary from the mild nodes of Heberden, or a still milder though characteristic ulnar deflection of the fingers, up to typical and extreme deforming and disabling joint lesions.

The typical and well-marked cases of arthritis deformans occur in both acute and chronic forms; while it usually develops in adults, especially in females, and most frequently during the third decade of life, an infrequent form of the disease occurs in children. The changes in the hand are often highly characteristic. The finger joints are enlarged and nodular; their mobility is decreased or they may be entirely immovable; they crepitate harshly; the phalanges are deflected laterally, backward, or forward. The wrist may also be involved. The deformity is unsightly, and the disability may be complete, the locked, distorted, and immovable fingers being incapable of any use. Both hands are affected; and several or all the joints are involved. The disease is progressive for a period, one joint becoming invaded after another, until a period of final arrest occurs. The fingers (all excepting the thumb) are usually deflected toward the ulnar side, at the metacarpophalangeal articulations, in a very characteristic manner; exceptionally radial deflection of the fingers is observed.

In severe cases a rather characteristic deformity may be manifested, consisting in a flexion of the proximal and terminal phalanges, and superextension of the middle phalanges (Fig. 2493).

FIG. 2493.—Arthritis Deformans; Radial Deflection of Fingers and Superextension of Middle Phalanges. (Original.)

Little can be accomplished in treatment of these conditions. The damage once done is irreparable, and the most that can be hoped for is arrest of the progress of the disease.

Heberden's Nodes (distinguished by William Heberden, 1782) are small nodular projections or osteophytes which occasionally develop on the fingers, particularly on the sides of the distal phalanges and distal joints. They are said to appear oftener in women, at about thirty to forty years of age. They are usually regarded as a mild manifestation of arthritis deformans, and while not curable are considered as of favorable prognostic significance inasmuch as when they occur the disease does not extend to other joints or produce serious consequences.

Ulnar Deflection of the Fingers at the metacarpophalangeal joints often occurs unassociated with any other evidence of rheumatoid articular disease, so that it may perhaps be regarded as a very mild form of arthritis deformans or rheumatoid disease. It is common in elderly persons, as if it were a senile change. It may also appear in earlier adult life as a consequence of acute or subacute articular rheumatism of the metacarpophalangeal joints. This condition, although but a slight deformity, presents a characteristic appearance; the little, ring, middle, and index fingers are slightly flexed, and bent laterally to the ulnar side at the metacarpophalangeal joints.

Changes in Extensibility of Metacarpophalangeal Joint of the Thumb at Different Ages.—In many cases the structures making up the metacarpophalangeal articulation of the thumb undergo progressive changes at different periods of life, such that while in childhood the proximal phalanx of the thumb is markedly lax and superextensible, in old age its extensibility may be diminished very much below the norm of the adult period. The condition of this joint is therefore to be considered in three periods—in childhood, in the adult, and in old age.

1. In young *childhood* in a large proportion of individuals the ligaments of the joint in question are very lax, so that the proximal phalanx can be superextended or bent backward at a marked angle, even to a right angle (see Fig. 2494). Usually the superextension can be accomplished by the free and unassisted action of the extensor muscles; occasionally the superextension can be brought about only by assistance or passive action. The position of superextension is a sort of subluxation of the joint, and the phalanx when extended goes back with a sudden slip. The condition is by the laity often called "double-jointedness." This laxity of the joint is very common in children up to the age of six or seven years, occurring to a greater or less degree in nearly a half of white children. After that age the superextensibility

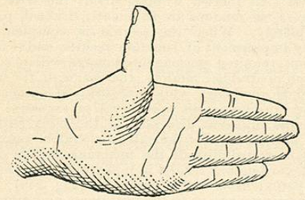

FIG. 2494.—Hand of a Boy Six Years Old, Showing Voluntary Superextension of Thumb. (Original.)

gradually diminishes, until about the age of puberty, when it usually has entirely disappeared. Occasionally, however, superextensibility of the thumb persists to maturity, especially in persons whose finger joints generally are unusually lax, and in those in whom this laxity is developed and maintained by such occupations as piano-playing.

The superextensibility varies in extent, from a slight increase to an extreme degree of laxity. Usually both thumbs are superextensible, though sometimes one thumb, especially the left, may be affected alone. The left thumb appears to be rather more subject to this peculiarity than the right, as shown by its being often superextensible to a greater degree than the right when both thumbs are involved, and by its being most subject when only one thumb is affected. The two sexes are about equally subject to this condition.

In an examination, by the writer, of the hands of 161 white children from three to fourteen years of age the following data as to this condition were found:

Age (years).	Thumbs not at all Superextensible.			One or Both Thumbs More or Less Superextensible.				
				Number.				
	Male.	Female.	Total.	Male.	Female.	Total.	Per cent.	Total.
3– 6	4	12	16	10	3	13	45	29
7–10	27	24	51	5	10	15	33	66
11–14	30	28	58	5	3	8	12	66
Total ...	61	64	125	20	16	36	22	161

Of the 36 cases in this series in which one or both thumbs were more or less superextensible, both thumbs were slightly superextensible in 6, and were markedly superextensible in 19; the left thumb alone was superextensible in 10; the right thumb alone was superextensible in 1—total, 36.

Among 73 colored children, 38 girls and 35 boys, aged from two to fifteen years, superextensibility of the proximal phalanx of the thumb was noted in only two instances (girls, aged ten), and that to a slight degree only. This would indicate that the peculiarity is less common in the negro race.

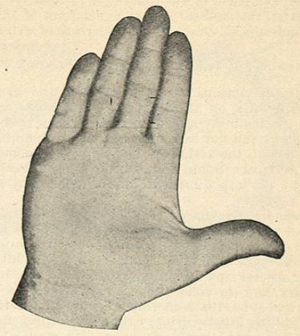

FIG. 2495.—Hand of a Man Aged Thirty-three, Showing Full Normal Adult Extension of Thumb. (Original.)

2. In the *adult* period the first phalanx of the thumb when fully extended normally lies in line with the metacarpal bone, or at an angle slightly short of this line (Fig. 2495).

3. In *old age* not infrequently the proximal phalanx of the thumb is very much decreased in extensibility, so that when fully extended it cannot be brought within a considerable angle (often not within forty-five degrees) of the line of the metacarpal bone extended) (Fig. 2496). With this, the distal phalanx is often considerably superextended and curved backward. The condition occurs alike in those who have or have not been subject to rheumatism, and in those who have or have not pursued laborious manual occupations.

FIG. 2496.—Hand of a Man Aged Sixty-Nine, Showing Full Extension (Much Diminished) of Proximal Phalanx of Thumb. This subject had been a clerk by occupation, doing no manual labor, and had not had rheumatism. (Original.)

The superextensibility of the thumb in childhood appears to be due to laxity of the ligamentous structures of the metacarpophalangeal joint. Its subextensibility in old age appears to result from shortening of the ligaments or alterations in the configuration of the hard parts of the joint, produced either by senile changes or perhaps by a mild and distinctive form of arthritis deformans.

Senile Joint Changes.—The finger joints in old age often exhibit alterations, which are partly due to mild rheumatoid lesions, partly to real senile changes. The finger joints often have a diminished range of mobility. They sometimes have an en-

larged appearance, partly from real enlargement, partly from atrophy of the soft tissues of the phalanges. Ulnar deflection of the fingers is frequently seen, without other material evidences of rheumatoid arthropathy. As just considered, the metacarpophalangeal joint of the thumb often undergoes a characteristic decrease of extensibility.

Affections of the Tendons and Tendon Sheaths.

Small fibromatous *tumors* occasionally develop on tendons, especially on those of the flexor muscles of the fingers, palpable as subcutaneous nodules moving with the tendons and not causing material trouble unless they interfere with the action of the tendon or become painful from pressure. Some forms of trigger finger are produced by the impediment to motion caused by such tendinous nodules.

Tenosynovitis.—One of the favorite seats of various forms of inflammation of the tendon sheaths is about the wrist, hand, and forearm. Infectious and suppurative inflammation is common in connection with whitlows and palmar abscess; pain is intense, early and free incision is necessary, and the consequences may be serious. Gonorrhœal tenosynovitis sometimes occurs about the hand, and syphilitic involvement of these structures may occur.

Acute non-suppurative tenosynovitis may occur in the hand or forearm, from occupation irritation, contusions or other traumatisms, or spontaneously from undeterminable causes. The symptoms are pain, swelling, friction and crepitation, effusion of fluid.

The treatment consists chiefly of rest and immobilization and sedative or counterirritant applications.

Chronic Tenosynovitis in all or nearly all cases is of tuberculous nature. Most of the cases occur in the forearm and hand. It presents a number of forms—a simple serous effusion into the thecal sac, an effusion with rice-grain bodies, or an exuberant granulating form. It occurs more especially in women, in the delicate and unhealthy, and in those with a family or personal tuberculous taint; manual work, like wringing clothes, sometimes predisposes to it. The onset is gradual and the course very chronic. Pain is not severe.

In the forms with effusion there is an elongated swelling along the course of the tendon, with fluctuation. If the "rice-grain" or "melon-seed" bodies are present, they can be felt and can be rubbed on the tendon or sheath with rough friction. The inflammation may be confined to a limited portion of the tendon, or may extend the entire length of the sheath and to other sheaths.

In the fungous granulating forms the tendon and sheath are involved in an exuberant granulation process, which causes irregular distention along the sheaths, with a peculiar feeling, but no fluctuation.

The site of tuberculous tenosynovitis is especially on the dorsal or palmar aspect of the wrist, though it may extend along the anterior or posterior surfaces of the digits. At the wrist, the annular ligaments passing over the tendon sheaths may cause a constriction in the swelling at that point, forming an hour-glass appearance, sometimes called "compound ganglion."

The tuberculous process may extend to neighboring joints and other tissues. The condition may simulate

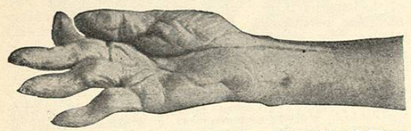

Fig. 2497.—Superextension Resulting from Non-Union of Flexor Tendons of Middle, Ring, and Little Fingers, Severed by an Incised Wound Twenty-Six Years Previously. (Original.)

lipoma, ganglion, chronic abscess, gumma, sarcoma; the diagnosis is made by the presence of fluctuation or rice bodies, the examination of aspirated fluid, and the tuberculous history. The treatment consists in rest, pressure, counterirritation, aspiration, injection of iodoform emulsion; incision with drainage; or incision, cleaning out the cavity, and immediate suture; or curettage, etc.

Ganglion. — This occurs as a small subcutaneous rounded hard swelling, containing a viscid fluid; it is most commonly situated on the back of the wrist, but it also occurs in the palm, fingers, and elsewhere. Exceptionally it may be due to a hernial protrusion of articular synovial membranes or tendon sheaths, or to enlarged bursæ, but usually it is a cystic formation developing in connection with the walls of the tendon sheaths, but not communicating with their cavity. It is usually of slow development and sometimes disappears spontaneously. A soft swelling or ganglion on the back of the wrist is sometimes present in chronic lead poisoning. Its treatment consists in rupture by firm pressure or a blow, or evacuation by aspiration or subcutaneous incision. If it recurs after this treatment the cyst and its wall should be excised.

Injuries.—In incised wounds about the wrist, hand, and fingers, the tendons are frequently divided, partially or completely. When the section is complete corresponding impairment of function results, and if the tendon is not reunited permanent damage will ensue. In non-union of divided tendons, the action of the muscles involved is abolished, while unrestrained action of the opposing muscles causes a habitual or excessive deflection, in the opposite direction, of the bony parts supplied. Thus, section of the extensor tendons causes flexion and inextensibility of the phalanges, while division of the flexor tendons results in inflexibility, extension, or even superextension of the phalanges (Fig. 2497).

The consequences, as to the usefulness and appearance of the hand, of non-union of severed tendons are so serious that in all wounds of this region particular care should be taken to determine if any tendons are divided; and if so, the ends should be sutured together with catgut and the parts afterward kept at rest until union is obtained.

Subcutaneous rupture of the extensor tendons inserted into the distal phalanges sometimes occurs, giving rise to the condition known as mallet finger.

Adhesions of digital tendons to their sheaths or surrounding tissues are not uncommon from tenosynovitis, especially from whitlow or palmar abscess, or from cicatricial involvement after healing of wounds. Adherent tendons cause a corresponding loss of mobility of the parts supplied by them, or even a greater or less immobility in normal or abnormal positions—the so-called "tendinous ankylosis." In conditions in which adhesions of the tendons threaten to result, attempts should be made to prevent such a consequence. During immobilization of the hand in fractures early and frequent passive movement of the fingers should be practised to obviate tendinous adhesions. After thecal inflammations and wounds similar exercise of the fingers may prevent adhesions.

After firm adhesions are once established it is difficult or impossible to free the tendons, though a faulty position of a finger might be improved by operative measures.

Mallet or Drop Finger is an uncommon condition in which the essential lesion is a subcutaneous rupture of the extensor tendon inserted into the distal phalanx of a finger. It is caused by violence, often slight and insignificant, such as catching the finger tip in the clothing, or a slight push in the direction of flexion on the end of the finger. The tendon is torn at or near its insertion into the base of the terminal phalanx. The rupture may be complete; or it may be partial, a thinning or fraying and stretching of the tendon. In consequence of the rupture the power of extension (except passively) of the distal phalanx is lost, and from unopposed action of the flexor the phalanx drops limply forward and stands flexed at an angle (up to a right angle) with the finger.

Immediately after the injury there may be some inflammatory symptoms; but as these subside the phalanx is left helpless and inextensible in a flexed position.

The condition is said to be sometimes curable by keeping the phalanx well extended by splints for three or

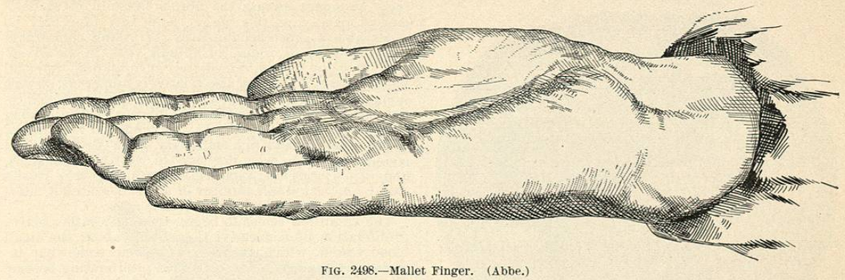

Fig. 2498.—Mallet Finger. (Abbe.)

four weeks. If this fails operation is necessary. A longitudinal incision is made over the back of the joint, and the ruptured extensor tendon exposed; the severed ends of the tendon are then to be sewed together, shortening them if necessary; or the proximal end may be advanced and sutured into the periosteum or into the skin near the root of the nail. After the latter procedure the nail is sometimes temporarily lost.

Affections of Connective-Tissue Structures.

Aside from inflammatory and infectious processes in these tissues, the fascial and ligamentous structures of the hand are subject to certain characteristic affections, namely, Dupuytren's contraction of the palmar fascia, contraction of digital fascia, hammer finger, and general palmar induration.

Dupuytren's Contraction of the Palmar Fascia.

This not uncommon affection consists in a hypertrophy of definite tracts of the palmar fascia, with shortening of the hypertrophied band, resulting in flexions or contractions of the phalanges and changes in the configuration of the palm.

While not previously entirely unknown, the true nature of this condition was first demonstrated by G. Dupuytren, whose original deliverance on the subject was given in 1831. Numerous studies of the disease have since been made, an extensive literature has been produced, and several hundred cases have been recorded. Its morbid anatomy and mechanism have been settled by numerous operations and post-mortem dissections, but its etiology is still obscure.

The primary seat of this affection is in the palmar fascia or aponeurosis, a knowledge of the anatomy of which is essential to an adequate understanding of the pathology and mechanism of Dupuytren's contraction. The palmar fascia is a triangular or fan-shaped expansion of firm fibrous tissue radiating over the metacarpus, with the apex of the triangle situated at the depression between the thenar and hypothenar eminences (the "interthenar depression"), where the fascia is continuous with the annular ligament of the wrist and the tendon of the palmaris longus muscle. Opposite the metacarpophalangeal articulations there is a well-marked transverse fibrous band, the "superficial transverse ligament of the palm"; at this point many of the longitudinal fibres in the fan-shaped palmar fascia terminate, leaving a few fibres to pass to each of the digits, where they are attached to the skin and fibrous investments of the phalanges. At the web of the fingers there is another transverse fibrous band, the "fibres of Gerdy," or the "superficial transverse ligament of the fingers." The palmar fascia is situated immediately beneath the skin of the palm, from which it is separated only by thin masses of fatty and areolar tissue. The fascia is intimately connected with the skin by numerous fibrous bands—a point to be borne in mind in connection with the mechanism of Dupuytren's contraction. Microscopically, the fascia consists of coarse longitudinal and transverse bundles of dense white fibrous tissue, which in places are connected with the corium by smaller fibrous bands crossing through the fatty layer which separates the fascia from the cutis. Among the fibres elongated connective-tissue cells are numerous, and minute blood-vessels penetrate and accompany the fibrous fasciculi (see Fig. 2499).

Dupuytren's contraction consists essentially of a hypertrophy or hyperplasia of limited longitudinal portions or fasciculi of the fascia of the palm and fingers, together with, usually, contraction or shortening of the hypertrophied band in a longitudinal direction. This condition results in (1) flexions or contractions of the phalanges of the fingers caused by the traction of the shortened bands;

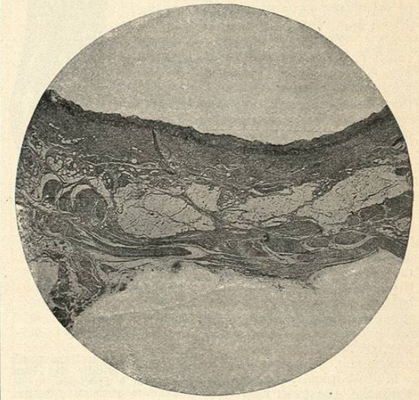

Fig. 2499.—Transverse Section of Normal Skin and Subcutaneous Tissues and Fascia from Right Palm, over Metacarpophalangeal Joint of Ring Finger, from Man Aged Seventy-eight Years, Showing Longitudinal and Transverse Bands of Fascia and Fibres Connecting them with the Cutis. Magnified 10 diameters. (Original.)

and (2) induration and changes in the surface configuration of the palm, caused mostly by traction on the small fibres connecting the band with the overlying corium,

or by the thickened and elevated tissues beneath lifting up the skin. Whether the lesion is a hypertrophy or a neoplasm has been a point of discussion. The flexor

FIG. 2500.—Transverse Section of Skin and Band of Contracted Fascia Leading to Little Finger, Right Palm. Magnified 10 diameters. (Author's case.)

tendons, which lie beneath the palmar fascia, are not in the least affected, though the bending of the fingers strongly suggests a muscular or tendinous pull. Prolonged malposition and immobilization of the joint in some cases produce changes in the affected articulations; involvement of the tendon sheaths has also been reported.

A few microscopical examinations of the lesion have been made, which afford some information as to its histology. The band causing the contraction, plainly visible to the naked eye, is a prominent rounded or oval longitudinal band of dense fibrous tissue, 2 to 5 mm. in diameter, belonging to the palmar fascia and situated in the subcutaneous tissue. The band may lie in contact with the cutis vera with nothing intervening, though the tissues of the corium and the band are usually distinctly marked off from each other without merging or being continuous together; or the band in places may be separated from the corium by an interval occupied by areolar and adipose tissue.

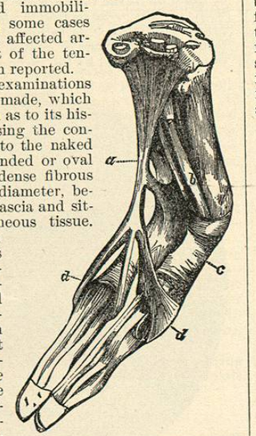

FIG. 2501.—Dissection of Dupuytren's Contraction of Middle and Ring Fingers, from a Specimen in St. Bartholomew's Hospital Museum. *a*, Contracted band of palmar fascia; *b*, flexor tendons; *c*, sheath of flexor tendons; *d*, insertion of contracted bands into base of middle phalanx. (Adams.)

Microscopically (Fig. 2500) the contracted band is seen to consist of a dense aggregation of longitudinal fasciculi of white fibres, among which are elongated fusiform connective-tissue cells and small vascular channels in greater or less abundance. The tissue is essentially identical with that of the normal palmar fascia, being a hypertrophic or hyperplastic development of the latter. The skin in some instances is rather thickened and indurated, but aside from this all the other elements of the skin and adjacent structures are unaffected.

In the early and developing period of Dupuytren's contraction the cellular and vascular elements are exceedingly abundant among the fibrous fasciculi of the contracted band. In this stage there may especially be observable a great accumulation of young connective-tissue cells, small, round, or spindle cells, in the adventitia of, or the tissues immediately surrounding, the small blood-vessels, which are also relatively numerous. Some young fasciculi are composed almost entirely of connective-tissue cells or fibroblasts, the fibrous elements being in process of formation. As the condition becomes of longer standing and in a stationary stage the vessels and connective-tissue cells decrease in relative abundance, and in old and long-established cases cells and vessels may be in very small number or altogether absent, leaving the fibrous band a dense sclerotic mass.

The condition seems to begin, then, as a rather active proliferation of connective-tissue cells about the small blood-vessels, which themselves become somewhat increased in number. The cells thus proliferating become fibroblasts and develop the fibrous fasciculi which constitute the contracted band. The process is therefore a fibrosis, limited to circumscribed longitudinal tracts of the palmar fascia, and is quite identical with the cirrhoses of the viscera or with the process often styled chronic interstitial inflammation. It is practically a hyperplasia or hypertrophy of longitudinal tracts of the palmar fascia, together with, usually, a longitudinal contraction of the affected tissue, the thickening being manifested in the transverse diameters.

Cases of Dupuytren's contraction may be in general divided into two clinical groups: 1. The ordinary typical cases in which there is contraction of one or more fingers together with the characteristic manifestations in the palm of the hand. The flexion of the fingers varies from marked deformity and disability to only slight limitation to the extensibility of the digit. This class, therefore, merges gradually into the next group without sharp dividing lines. 2. Cases in which the lesion is confined to the palm, there being hypertrophy of the palmar fascia and the characteristic thickening, induration, and altered conformation of the surface in the palm, but

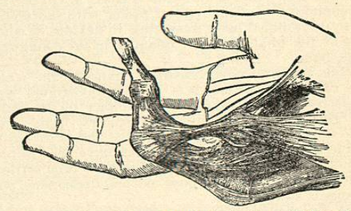

FIG. 2502.—Dissection of Dupuytren's Contraction of Little Finger, From a Specimen in King's College Museum. (Druitt.)

without contraction of the fingers. These cases are usually slight, yet they sometimes amount to considerable deformity.

The clinical picture is very characteristic. The hypertrophied bands occupy certain definite positions. Running from the direction of the interthenar depression, they cross the concavity of the palm longitudinally, in taut straight lines, as a bowstring is stretched across the concavity of the bow. The thickened and elevated bands form prominent ridges across the palm, very apparent to sight and feeling. The bands pass in direct and definite lines to the fingers, having a definite locus and relation with the metacarpal bones, and do not take the direction of the interspaces between the digits. In the fingers the band usually follows the mid-palmar line; but occasionally, especially in the little finger, the band

crosses the proximal phalanx obliquely, or lies toward one side. Ordinarily the bands in the palm do not branch, each finger having its band distinct from the others; but sometimes a band going to one finger divides near the metacarpophalangeal joint and sends a branch to an adjacent finger.

Besides the ridges formed by the elevated and thickened fascia bands, there are other characteristic alterations of the configuration of the surface of the palm (see Fig. 2503). Minute punctate depressions of the skin, pointing inward and often wristward, are common; they are caused by traction on bands connected with the cutis. Nodules like callosities, formed by indurations of the skin and fascia, are of frequent occurrence. The metacarpophalangeal articulations (especially of the ring finger) are favorite localities for these indurations and inversions of the skin, though they may occur anywhere over the proximal phalanges. The transverse line in the palm

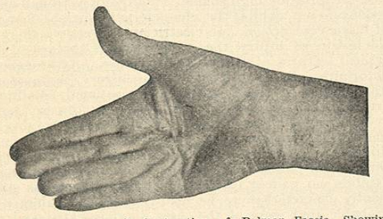

FIG. 2503.—Dupuytren's Contraction of Palmar Fascia, Showing Marked Changes in the Palm, with Slight Contraction of Ring and Middle Fingers. (Notice punctate depression of skin at distal end of proximal phalanx of middle finger.) (Original.)

over the metacarpophalangeal articulations is often much deepened by the flexion of the fingers. The traction sometimes produces tension or stretching of the skin.

The mode of distal termination of the bands varies somewhat. Many small fibres terminate in and are connected with the cutis, causing the characteristic depressions of the skin. In many of the cases in which the lesion is confined to the palm the bands terminate near the metacarpophalangeal joints, expending their force on the skin and subcutaneous tissues at those points instead of drawing on the fingers. Occasionally a thick and well-marked band proceeds some distance up a finger, yet (not being shortened) without producing any flexion of the phalanges. Many bands terminate by a general blending with the skin or subcutaneous fibrous investments of the finger, usually around the proximal phalanx; many others have a more or less distinct insertion, especially at the proximal end of the middle phalanx.

The contraction of the fingers is caused by the traction exerted by the shortened palmar bands, and consists in a limitation of the extensibility of the finger; within the limits allowed by the contracting band flexion and extension are unimpeded, but beyond them further extension is impossible. The degree of contraction varies from complete flexion of the finger into and against the palm to only slight limitation of the full extensibility of the finger. The contracting force may be exerted on any of the three phalanges, though almost always on the proximal or middle and only very infrequently on the distal phalanx. When the traction is exerted on the proximal phalanx, mostly by a general pull on the skin and fibrous investments, the finger is flexed as a whole on the metacarpophalangeal joint, the extensibility of the middle and terminal phalanges being unaffected. When the traction is on the middle phalanx, this is flexed on the proximal phalanx; and if, as commonly occurs, the band is sufficiently shortened, the proximal phalanx is also flexed on the metacarpus, although the band may not be connected with this phalanx. The distal phalanges are flexed and connected with the contracted band in only a very small proportion of the cases. Fingers adjacent to one strongly contracted are frequently slightly bent from traction of the fibres of Gerdy or the web of the fingers.

Either hand may be affected alone, or both hands may be involved together. In 184 cases collected by W. W. Keen, the right hand was involved alone in 58, the left

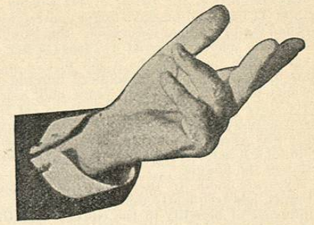

FIG. 2504.—Dupuytren's Contraction of Ring and Little Fingers. (Clarke.)

hand alone in 23, both hands in 103. In 49 cases examined by the writer the right hand was affected in 12, the left hand in 15, both hands in 22.

Any of the digits may be involved, but the thumb and index finger are rarely affected. The ring finger is much oftenest contracted, and the little finger in a large proportion of the cases; the middle finger is frequently involved, but not so often as the ring and little fingers. In 263 cases (214 collected by Keen, 49 observed by the writer) 572 fingers were affected in all, as follows: 12 thumbs, 24 forefingers, 93 middle fingers, 249 ring fingers, 194 little fingers.

One finger may be affected alone, or two or more fingers on the same hand may be contracted together. The commonest conditions are for the ring finger to be contracted alone, little finger alone, ring and little fingers, middle and ring fingers, in about the order stated. When two or more fingers on a hand are contracted, they are usually adjacent, though not always.

When both hands are affected, the contraction always or almost always begins in one hand before the other. Usually the two hands are affected to unequal degrees. Sometimes there is very little difference in the extent of the contraction in the two hands; in numerous other cases the hands are very unequally affected, one hand showing marked finger contractions while the other may exhibit only slight stigmata of the disease in the palm. The hand first affected is usually the one worse affected. The lesions are not exactly symmetrical in most cases, but have different locations in the two hands; thus, the ring finger of one hand and the ring and little fingers of the other may be the ones involved, or the ring finger of one and the middle finger of the other, and so on for a large number of possible combinations; still, in some cases the same digits are affected on the two hands. In the great majority of the bilateral cases, therefore, the two hands differ in the time of onset of the disease, the degree of the contractions, and the location of the lesions.

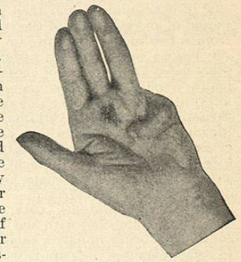

FIG. 2505.—Extreme Dupuytren's Contraction of Little Finger. (Original.)

As to the frequency of Dupuytren's contraction, William Anderson states that of 2,600 adults of the poorer