white substance of Schwann, penetrate into the corpuscle, where the axis cylinders, dividing, end in some way un­known. The cor­puscles do not con­tain any soft core, but are apparently built up of irregu­lar septæ of con­nective tissue, in the meshes of which the nerve fibrils end in ex­pansions similar to Merkel’s cells. Dr Thin describes simple and com­pound corpuscles according to the number of nerve fibres entering them. These bodies are found abun­dantly in the palm of the hand and sole of the foot, where there may be as many as 21 to every square millimetre (1 mm. = 1/25 inch). They are not so numerous on the back of the hand or foot, mamma, lips, and tip of the tongue, and they are rare in the genital organs. “ Kollmann describes three special tactile areas in the hand :—(1) the tips of the fingers, with 24 touch corpuscles in a length of 10 mm.; (2) the three eminences lying on the palm behind the slits between the fingers, with 5∙4-2∙7 touch-corpuscles in the same length ; and (3) the ball of the thumb and little finger, with 3∙1-3∙5 touch corpuscles. The first two areas also contain many of the corpuscles of Vater or Pacini, whilst in the latter these corpuscles are fewer and scattered. In the other parts of the hand the nervous end­organs are much less developed ” (Landois and Stirling).

(3) *The Corpuscles of Vater or Pacini.—*These, first described by Vater so long ago as 1741, are small oval bodies, quite visible to the naked eye, from to of an inch long and to of an inch in breadth, attached to the nerves of the hands and feet. They can be readily demonstrated in the mesentery of the cat (fig. 8). Each corpuscle consists of 40 to 50 lamellae or coats, like the folds of an onion, thinner and closer to­gether on approaching the centre. Each lamella is formed of an elastic material mixed with delicate con­nective tissue fibres, and the inner surface of each is lined by a single continuous layer of endothelial cells. A double-contoured nerve fibre passes to each. The white substance of Schwann becomes continuous with the lamellae, whilst the axis cylinder passes into the body, and ends in a small knob or in a plexus. Sometimes a blood­vessel also penetrates the Pacinian body, entering along with the nerve. Such bodies are found in the subcutaneous tissue on the nerves of the fingers and toes, near joints, attached to the nerves of the abdominal plexuses of the sympathetic, on the coccygeal gland, on the dorsum of the penis and clitoris, in the meso-colon, in the course of the intercostal and periosteal nerves, and in the capsules of lymphatic glands (William Stirling).

*Physiology of Touch in Man.—*Such are the special end­organs of touch. It has also been ascertained that many sensory nerves end in a plexus or network, the ultimate fibrils being connected with the cells of the particular tissue in which they are found. Thus they exist in the cornea of the eye, and at the junctions of tendons with muscles. In the latter situation “ flattened end-flakes or plates ” and “ elongated oval end-bulbs ” have also been found (Sachs, Rollett, Golgi). A consideration of these various types of structure show that they facilitate inter­mittent pressure being made on the nerve endings. They are all, as it were, elastic cushions into which the nerve endings penetrate, so that the slight variation of pressure will be transmitted to the nerve. Probably also they serve to break the force of a sudden shock on the nerve endings.

*Sensitiveness and Sense of Locality.—*The degree of sensitiveness of the skin is determined by finding the smallest distance at which the two points of a pair of compasses can be felt. This method, first followed by Weber, is em­ployed by phy­sicians in the diagnosis of nervous affections involving the sensitiveness of the skin. The following table shows the sensitiveness in millimetres for an adult, whilst the corresponding numbers for a boy 12 years of age are given within brackets (Landois and Stirling, after Weber): Millimetres.

|  |  |  |
| --- | --- | --- |
| Tip of tongue | 1∙1 | [1∙1] |
| Third phalanx of finger, volar surface | 2-2∙3 | [1∙7] |
| Red part of the lip | 4∙5 | [3∙9] |
| Second phalanx of finger, volar surface | 4-4∙5 | [3∙9] |
| First phalanx of finger, volar surface | 5-5∙5 |  |
| Third phalanx of finger, dorsal surface | 6∙8 | [4∙5] |
| Tip of nose | 6∙8 | [4∙5] |
| Head of metacarpal bone, volar | 5-6∙8 | [4∙5] |
| Ball of thumb | 6∙5-7 |  |
| Ball of little finger | 5∙5-6 |  |
| Centre of palm | 8-9 |  |
| Dorsum and side of tongue ; white of the lips ; metacarpal part of the thumb | 9 | [6∙8] |
| Third phalanx of the great toe, plantar surface, | 11∙3 | [6∙8] |
| Second phalanx of the fingers, dorsal surface... | 11∙3 | [9] |
| Back | 11∙3 | [9] |
| Eyelid | 11∙3 | [9] |
| Centre of hard palate | 13∙5 | [11∙3] |
| Lower third of the fore-arm, volar surface | 15 |  |
| In front of the zygoma | 15∙8 | [11∙3] |
| Plantar surface of the great toe | 15∙8 | [9] |
| Inner surface of the lip | 20∙3 | [13∙5] |
| Behind the zygoma | 22∙6 | [15∙8] |
| Forehead | 22∙6 | [18] |
| Occiput | 27∙1 | [22∙6] |
| Back of the hand | 31∙6 | [22∙6] |
| Under the chin | 33∙8 | [22∙6] |
| Vertex | 33∙8 | [22∙6] |
| Knee | 36∙1 | [31∙6] |
| Sacrum (gluteal region) | 44∙6 | [33∙8] |
| Fore-arm and leg | 45∙1 | [33∙8] |
| Neck | 54∙1 | [36∙1] |
| Back of the fifth dorsal vertebra ; lower dorsal and lumbar region | 54∙1 |  |
| Middle of the neck | 67∙7 |  |
| Upper arm; thigh; centre of the back | 67∙7 [31∙6-40∙6] |  |

These investigations show not only that the skin is sensitive, but that one is able with great precision to distinguish the part touched. This latter power is usually called the *sense of locality,* and it is influenced by various conditions. The greater the number of sensory nerves in a given area of skin the greater is the degree of accuracy in distinguishing different points. Contrast in this way the tip of the finger and the back of the hand. Sensi­tiveness increases from the joints towards the extremities, and, as pointed out by Vierordt, sensitiveness is great in parts of the body that are actively moved. The sensibility of the limbs is finer in.