

HAIR.

HAIR, including bristles, wool, fur, &c., is a modification of the Epidermis (q. v.), and consists essentially of nucleated particles. An ordinary hair consists of a *shaft* and a *bulb*. The shaft is that part which is fully formed, and projects beyond the surface. If we trace it to the skin,

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we find it rooted in a follicle in the cutis or true skin, or even in the connective or cellular tissue beneath it. This follicle is bulbous at its deepest part, like the hair which it contains, and its sides are lined with a layer of cells continuous with the epidermis. The layer (*b*) in fig. 1, according to Todd and Bowman (*Physiological Anatomy*, vol. i. p. 417), 'resembles the cuticle in the rounded form of its

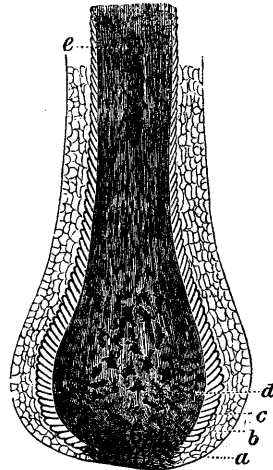


Fig. 1.

Magnified section of bulb of a small black human hair.

a, basement membrane of the follicle; *b*, layer of epidermic cells resting upon it; *c*, layer of imbricated cells, forming the outer lamina, or *cortex*, of the hair; *d*, more bulky cells containing pigment; *e*, a mass of cells in the axis of the hair, loaded with pigment.

deep cells, and the scaly character of the more superficial ones, which are here in contact with the outside of the hair (*c*). The hair grows from the bottom of the follicle, and the cells of the deepest stratum gradually enlarge as they mount in the soft bulb of the hair, which owes its size to this circumstance. If the hair is to be coloured, the pigment cells are also here developed. It frequently happens that the cells in the axis of the bulb become loaded with pigment at one period, and not at another, so that, as they pass upwards in the shaft, a dark central tract is produced, of greater or less length, and the hair appears here and there to be tubular (*e*). The shaft is much narrower than the bulb, and is produced by the rather abrupt condensation and elongation into hard fibres of the cells, both of those which contain pigments and those which do not. If the tissue is softened by acetic acid, these fibres may be readily seen under the microscope; they seem to be united into a solid rod by a material similar to that which cements the scales of the cuticle. The central cells, when filled with pigment, have less tendency to become fibrous than those lying more externally; and hence some writers have described the centre as a *medulla*, in distinction from the more fibrous part of the shaft, which they term the *cortex*. (This tubular character is constant in the hair of many animals, but is very variable in human hair, and even in the same hair at different parts of its length.) The term *cortex* or *bark* is more correctly applied to the single outermost layer of cells which overlap one another, and cause the sinuous

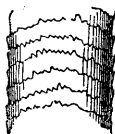


Fig. 2.

Surface of human hair, magnified.

transverse lines which are seen on examining a hair under the microscope.

In some hairs, especially those which act as tactile organs in some of the lower animals (as, for instance, in the whiskers of the various cats); a true papilla, furnished with nerves and capillaries, projects into the hair-bulb, and an approach to this papillary projection may often be seen in human hairs.

The hairs, like epidermis, are thus seen to be organised, and to maintain a vital, although not usually a vascular connection with the body. The colour of hair seems to depend on the presence of a peculiar oil, which is of a sepia tint in dark hair, blood-red in red hair, and yellowish in fair hair. This oil may be extracted by alcohol or ether, and the hair is then left of a grayish yellow tint. The chemical composition of hair closely resembles that of horn, and will be described in the article **HORN**Y TISSUES.

Hair is extremely strong and elastic, and hence its uses for the construction of fishing-lines, the stuffing of cushions, balls, &c. Amongst its other physical properties, we may mention that, when dry and warm, it is easily rendered electrical, and that it is extremely hygroscopical; readily attracting moisture from the atmosphere, and no doubt from the body also, and yielding it again by evaporation when the air is dry. Hairs elongate very considerably when moist—a property of which Saussure availed himself in the construction of his hygrometer, in which a human hair, by its elongation and contraction, according as the atmosphere is moist or dry, is made to turn a delicate index.

Hairs are found on all parts of the surface of the human body, except the palms of the hands and the soles of the feet; they differ, however, extremely in length, thickness, shape, and colour, according to situation, age, sex, or race. The differences dependent on situation, age, and sex, are so obvious that we shall pass them over without notice, and proceed to the most important differences dependent on race. With respect to the quantity of hair that grows on the human body, there are great differences in different races. The Mongols, and other northern Asiatics who are similar to them, are noted for the deficiency of their hair and for scanty beards, and the same character is ascribed to all the American nations; while, on the other hand, among the *Ainos*, or in the Kurilian race, there are individuals who have the hair growing down the back, and covering nearly the whole body. The northern Asiatics and the Americans have generally straight lank hair, while Europeans have it sometimes straight and flowing, and occasionally curled and crisped. Negroes present every possible gradation, from a completely crisp, or what is termed woolly hair, to merely curled, and even to flowing hair; and a similar observation holds regarding the natives of the islands in the great Southern Ocean. As there is a generally diffused opinion that the head of the African is covered with a species of wool instead of with true hair, we may mention that all true wools which have been examined microscopically (as merino wool, the wool of the tiger, rabbit, bear, seal, and wolf-dog, which were investigated by the late Mr Youatt), present a more or less sharply serrated or jagged surface, while hairs present merely an imbricated appearance. This characteristic of wool is shewn in fig. 3, where *a* represents a fibre of merino wool, viewed as a transparent, and *b* as an opaque object. 'Hairs of a negro, of a mulatto, of Europeans, and of some Abyssinians, sent to me (says Dr Prichard) by M. d'Abbadie, the celebrated traveller, were, together with the wool of a southdown sheep, viewed both as transparent and opaque bodies. The filament of wool had a very rough and irregular surface;

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the filament of negro's hair, which was extremely unlike that of wool and of all the other varieties mentioned, had the appearance of a cylinder, and the colouring matter was apparently much more

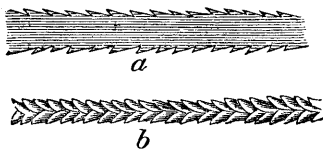


Fig. 3.
Fibre of Wool.

abundant than in the others.' It is in consequence of the above named difference between hair and wool that, although the former will entangle to a certain degree, it will not felt into a compact mass, which is the characteristic property of good wool.

The grayness of hair in advanced life results from a deficient secretion of pigment. Well-authenticated cases are on record in which the hair has grown gray or white in a single night, from the influence of fear, distress, or any variety of strong mental excitement. It is not easy to explain this phenomenon. Vauquelin suggested that it might result from the secretion at the bulb of some fluid (perhaps an acid), which percolates the hair, and chemically destroys the colouring matter.

The chief use of the hair, and particularly of the fur of various mammals which is especially developed in the winter, is to protect the body from external cold. Except on the scalp, and on the throat, this cannot be considered as applying to man. What, then, are the uses of the hair on the face, and especially on the upper lip? We shall answer this question with an extract from an article 'On the Use of the Hair' in *The Lancet* for November 3, 1860: 'Mr Chadwick, who has done so much for sanitary reform, tells us that he was once very much struck by seeing some blacksmiths who wore beards, with their moustaches discoloured by a quantity of iron dust which had accumulated amongst the hairs. Turning it over in his mind, it struck him that had not the dust been so arrested by a natural respirator, it must have found its way into the lungs, where it could not have been otherwise than productive of evil consequences. He hence rightly advised that the razor should be discarded by labourers in all dusty trades—such as millers, bakers, masons, &c.; by workmen employed in grinding iron or steel; and by travellers on dusty roads. In hot, sandy countries, the use of the beard is soon discovered; and travellers in Syria and Egypt find it necessary to defend their mouths against the entrance of the hot air of the desert. But not against dust alone is the facial hair a protection; it is the best barrier against cold air, biting winds, and wheezy fogs that a Northman can obtain. . . . According to Mr Chadwick, the sappers and miners of the French army, who are remarkable for the size and beauty of their beards, enjoy a special immunity against bronchial affections.' In corroboration of the last-named fact, we may mention another of a still more striking character. During the long-continued search for Franklin's expedition, a transport vessel, the *North Star*, was frozen up during one of the severest arctic winters on record, in Wolstenholme Sound. The crew maintained their health perfectly during all the trials to which they were exposed. On their return to England in the early summer, they shaved off the hair that had been growing around the mouth and throat for the last eight or nine months, and within a week every man was on the sick list with some form of bronchial or pulmonary disorder.

The length to which the hair of the head may grow normally, especially in women, is very considerable. In the 'Hair Court' of the International Exhibition (1862), there was a beautiful specimen of jet-black hair (British, we believe) measuring 74 inches.

Cases occasionally occur where there is an abnormal abundance of hair of considerable length in women, on parts where the hair is usually little more than down. A hairy lady, named Julia Pastana, supposed to be a Mexican, was some years ago exhibited in London. Her embalmed body was exhibited also in that city in 1862, and we extract the following remarks from a memoir on her in *The Lancet* for May 3 of that year: 'The ears, and all parts of the face except the eyes, were covered with hair of different lengths. The beard was tolerably thick, the hairs composing it being straight, black, and bristly, the part of it which grew on the sides of the chin hanging down like two plaits. . . . The upper portion of the back of the neck and the hinder surface of the ears, were covered with hairs. On the shoulders and legs, the hairs were as abundant as they are occasionally seen on very powerful men.'

Dr Chowne has described similar but less marked cases of hairy women in *The Lancet* for 1843.