

---

On the anatomy of the breast, by Sir Astley  
Paston Cooper, 1840

Rare Medical Books

---

1840

## On the anatomy of the breast - Of the areola

Sir Astley Paston Cooper , Bart.

Follow this and additional works at: <https://jdc.jefferson.edu/cooper>



Part of the [History of Science, Technology, and Medicine Commons](#)

[Let us know how access to this document benefits you](#)

---

### Recommended Citation

Cooper, Sir Astley Paston , Bart., "On the anatomy of the breast - Of the areola" (1840). *On the anatomy of the breast, by Sir Astley Paston Cooper, 1840*. Paper 8.

<https://jdc.jefferson.edu/cooper/8>

This Article is brought to you for free and open access by the Jefferson Digital Commons. The Jefferson Digital Commons is a service of Thomas Jefferson University's [Center for Teaching and Learning \(CTL\)](#). The Commons is a showcase for Jefferson books and journals, peer-reviewed scholarly publications, unique historical collections from the University archives, and teaching tools. The Jefferson Digital Commons allows researchers and interested readers anywhere in the world to learn about and keep up to date with Jefferson scholarship. This article has been accepted for inclusion in On the anatomy of the breast, by Sir Astley Paston Cooper, 1840 by an authorized administrator of the Jefferson Digital Commons. For more information, please contact: [JeffersonDigitalCommons@jefferson.edu](mailto:JeffersonDigitalCommons@jefferson.edu).

## OF THE AREOLA.

THE circle of skin which surrounds the base of the nipple has that name.

It is of a circular form, and is nearly upon a level with the surrounding skin.

The nipple springs out from it near its centre before lactation, but below the centre in lactating women.

It forms a smooth surface until the period of puberty, and then it has little eminences and tubercles upon its surface.

The diameter of the areola in a child is about half an inch. At puberty, and in young women, it is an inch ; during lactation, it is two inches or more ; and although, in after age, its colour diminishes, its diameter remains almost the same, excepting in very old persons, in whom it disappears.

The colour of the areola is rather darker than that of the nipple, but it varies in infancy, at puberty, in lactation, and in old age.

In the infant it is of a pinkish red ; at puberty, of a darker red ; in lactation, it becomes of a very dark colour, approaching that of the negro skin ; in age it remains dark, but in old age it sometimes loses its colour, which becomes

like that of the surrounding skin. This change of colour in the areola, in pregnancy, is of use both to the medical man, and to the female herself, in conveying information of her pregnant state, and is therefore much relied upon as a sign of that change in the uterus; but I have known a diseased and excited state of the uterus after marriage, when that organ had become enlarged, but not impregnated, produce a swelling of the breasts, and a discoloration of the areola; so that it is not an invariable criterion.

The change of colour, in the areola, which occurs in gestation, is attended with an increase of the size of the breast, and often with a secretion from the nipple. The cause of the change of colour I shall hereafter consider.

The areola is composed of the common integuments, somewhat modified.

Its *cuticle* is thin, like that of the nipple. It has a firm adhesion to the areola, because it passes between the papillæ, and into the wrinkles and folds of the cutis; and it therefore separates by putrefaction less readily than that of the surrounding skin, but more easily than that of the nipple.

It is thin, that it may not interfere with the sensibility of the cutis behind it. Like the cuticle of the nipple, it becomes, in women of light complexion, very frequently abraded, from the irritation of the child's lips, and a change

in the mother's own secretions, and those in the mouth of the child.

The anterior surface of the cuticle of the areola takes on the forms of the parts behind it; but its posterior surface is reticulated in larger and smaller meshes, which are received between the folds of the true skin.

*The rete mucosum* of the areola might have its existence doubted in infancy, on account of its want of colour; but as the age advances, the areola darkens, and the colouring matter becomes very apparent even through the cuticle.

Its peculiar arrangement is readily distinguished, by raising the cuticle of the areola by maceration, spreading it in alcohol, which fixes it, and then by viewing it, by means of a slight magnifying power, a dark reticular texture may be perceived, placed upon the edges of the folds of the cuticle, and upon its inner surface; and to this deposit upon the reticulated surface of the cuticle, its own reticular appearance is probably owing.

If the cuticle, with its lining of *rete mucosum*, be separated in water, the *rete mucosum* may be washed off in flakes of different sizes.

If the areola be steeped in alcohol, and the cuticle be then raised, the *rete mucosum* will be chiefly left upon the cutis.

The deposit of this substance does not appear to be reticulated, but that character it derives from the form of the inner side of the cuticle, as above mentioned; but it seems to be deposited in small flakes, the aggregation of which produces a sheet of colouring matter.

The quantity of rete mucosum secreted must depend greatly upon the quantity of blood determined to the part. As soon as the influence of the uterus and ovaria is felt by the breasts, and they swell from more blood being determined to them, the rete mucosum is more largely secreted, and the colour of the areola and nipple becomes darker.

When the pregnant state of the uterus enlarges the breast, by increasing the flow of blood to it, the rete mucosum increases in quantity; but still more in lactation, when the nipple and areola are greatly excited, the depth of colour is the greatest, and the best opportunity is afforded of observing the colouring matter.

As the circulation declines in age, the rete mucosum diminishes in the areola.

The menstrual secretion has, from the change thus produced upon the breast, some influence upon the colour of the nipple and areola.

The effect of a hot climate by determining large quantities of blood to the skin, produces also a greater quantity

of rete mucosum, and the change of complexion which climate produces, depends upon the greater or less circulation in the integuments, and accounts for the lightness of complexion in the northern parts of Europe, and its darkness in those who visit the south of Europe, or the East and West Indies.

The tanning which exposure to the sun in the summer of our climate occasions, is depending upon a similar cause.

With respect to the secretion of the rete mucosum, it is probably thrown out by the highly vascular surface of the cutis, not separated in the common state of the skin, but very visible under great determinations of blood to the cutis.

When I first visited the Museum of St. Thomas's Hospital, which was in the year 1784, there were three beautiful preparations, made by a Mr. Baynham\*, of a vascular membrane, upon the cutis. They were made from subjects which had died of the small-pox, and which he injected; and when he had raised the cuticle and rete mucosum, he found a separable, delicate, but distinctly vascular membrane, upon the surface of the cutis, and between it and the rete mucosum; these preparations, I believe, are still in the museum, but an unusual determination of blood to the skin is required, to render the membrane separable and demonstrable.

\* Mr. Baynham was a demonstrator of anatomy to Mr. Else, predecessor to Mr. Cline at St. Thomas's Hospital.

*Of the Cutis of the Areola.*

When the areola is examined with attention after the separation of the cuticle and rete mucosum, its surface is found to be covered with papillæ like those of the nipple, but of smaller size, although still extremely distinct. They are smallest at the circumference of the areola, but gradually increase in size as they approach the nipple.

They are disposed in circles, their bases fixed in the cutis, and the apex of each is directed towards the nipple, so that they are opposed to the papillæ of the lips of the child.

They are very vascular and sensitive bodies.

Their use is three-fold. First, they give a greater adhesion to the infant's lips in sucking; and secondly, they add to the sensibility and sympathies of the areola with the mammary gland; thirdly, they form a surface which is embraced by the child, and received into its mouth, so that the large lactiferous tubes behind the areola are emptied by the pressure of the lips of the infant.

The areola is, therefore, to be considered as an extension of the nipple, the base of which latter is lost in the former; its structure is very similar to that of the nipple, or mamilla.

The areola is a very vascular structure, and its arteries

are the same as those supplying the nipple, being derived—first, from the axillary artery; secondly, from the internal mammary artery between the second and third cartilages; and thirdly, from the internal mammary artery between the cartilages of the fourth and fifth ribs, beside other smaller branches. They most minutely divide upon the papillæ of the areola.

The *veins* form an ellipsis on the areola, and around it, which receives the branches of the nipple and areola, and then they pass into the larger veins, as those of the nipple.

When minutely injected, the veins form a most beautiful net-work.

The *absorbents* of the areola take the same course as those of the nipple into the axilla, and they pass into the anterior mediastinum, chiefly between the second and third, and fourth and fifth cartilages of ribs.

The *nerves* are the same as those which are distributed to the nipple, *viz.*, the fourth and fifth posterior from the direct dorsal branches, and the fourth anterior or reflected nerve, to the anterior part of the areola, this nerve passing through the intercostal muscles between the cartilages of the ribs: the second and third anterior nerves send filaments, also, upon the internal mammary branches, which descend towards the areola, and the third posterior dorsal sends a branch upon



the arteries descending to the breast from the axillary artery.

The areola, then, is to be considered as a part of the nipple, and a continuation of the organ of sucking. It, as well as the nipple, is received into the child's mouth, and is compressed by its lips and gums, and is drawn forward by them to compress and elongate the milk tubes. The larger milk tubes and reservoirs are placed behind the areola; and here, where the milk is collected, the compression is most effectual in emptying them, and in forcing out the accumulated secretion. So soon as the milk already formed is removed, the draught furnishes a fresh supply, and so it continues until that draught ceases.

#### *Of the Tubercles of the Areola.*

At the base of the nipple, and upon the surface of the areola, numerous tubercles appear in the skin; often they are placed upon the circumference of the areola, where it joins the smooth skin.

In these there are orifices very visible to the naked eye.

The orifices vary in number from one to five.

The tubercles perform three offices: first, they discharge from their little springs a lubricating secretion; secondly, they

add to the firmness of adhesion of the child's lips ; and thirdly, they give greater sensibility to the areola, and sympathetically excite a larger secretion from the mammary gland.

It is a curious circumstance that such excellent anatomists as Morgagni, Meckel, and others, should have thought that the orifices in these tubercles had communication with the lactiferous tubes, and that the milk could be squeezed through them, and therefore in this way that the milk might be in part discharged ; but that this opinion is not true, let any one satisfy himself, by grasping the nipple between his fingers, and then pressing upon the mammary gland ; no fluid but a small drop of mucous matter will escape from the tubercles, either in the living or the dead subject. When the breast is in a state of lactation, the fluid issuing from these tubercles is whiter than after lactation has ceased.

Secondly. Let him examine the areola and nipple when it has become putrid, and he will see numerous little glands around the base of the nipple, and behind the areola, which are rendered distinct from being discolored by the putrefaction. These glands are small and lobulated : they vary in size from that of a small to a large pin's head, but are of an oval form.

Thirdly. I am able to force injection into these glands through their external openings, and I have beautiful pre-

parations of them thus injected, and not one of them communicates with the lactiferous tubes.

Fourthly. A fascia separates entirely these glands from the lactiferous tubes.

They are, therefore, only mucous glands, formed to lubricate the nipple and areola, and to defend them from the friction of the child's lips, and the irritation of its secretions.

Those glandular tubercles which surround the nipple upon the areola, are more evolved than those situated at a greater distance.

These glands are very much enlarged in lactation, and pour out a fluid, which is coagulated by alcohol, and its appearance is like that of white of egg. The fluid they secrete has a tendency to lessen that excoriation which, when it does occur, renders suckling almost an agony.

If a breast be subjected to putrefaction, these glands are so darkened, as to become readily distinguishable on the internal surface of the cutis.

The glands are extremely vascular: they are lobulated and cellular. Each orifice opens into an arborescent vessel, or vessels. (*See Plate.*)

The *Skin* around the areola, and which covers and forms the surface of the breast, is particularly smooth, and gene-

rally very white ; and the cause of this in each is the fascia of the breasts being received into, and intermixed with, the cutis, so that it is rendered smoother than elsewhere, whilst the glistening fibres of the fascia increase its whiteness.

It is in this way, also, its firmness is increased ; and thus it is enabled to resist injuries.

A very few straggling hairs appear on it, as well as a slight down of finer hair.

A number of sudatory glands are perceptible upon the surface of the skin, from which much perspirable and mucous matter can be squeezed ; for if the breast be gently wiped dry, and then compressed, it will continue to perspire largely after being several times dried : this is more especially the case if the cuticle has been separated by putrefaction ; indeed, it is but little observable without it.

These pores often contain a fine hair, but they also secrete a fluid to cover the surface of the breast.

If the cuticle be raised by maceration and putrefaction, it is drawn out from these pores, into which the rete mucosum also enters, and which leaves them of a dark colour.

After the separation of the cuticle and hairs, I can throw coloured fluids into them, so as to make beautiful preparations. (*See Plate.*) :

The orifices lead to little glands, which are placed in the

cutis itself, appearing like the heads of small pins within the meshes of the true skin.

They differ from those of the areola, which project a little under the cutis, whilst these are buried in it, but the pore which they contain leads into an arborescent duct and gland. In the plates may be seen these sudatory glands injected, dividing into several branches, sometimes from two to five.

Thus, then, at the base of the nipple and areola, there are *areolar* mucous glands; but in the skin around, a smaller *cutaneous* set pour out a similar secretion, and from or near the same orifices small hairs proceed.

---