Man's face and mimic language

Hjortsjö, Carl-Herman

Lund, 1970

V The mimic muscles of the face

urn:nbn:at:at-ubi:2-7727

V The mimic muscles of the face

The description given in Chapter III has shown how strongly individually varying can the anatomical shape of the facial soft parts and organs be. It was also pointed out in the Introduction that this anatomical shaping can be so effective that it can give life to the appearance. But the really living, dynamic, facial expression is determined by another factor: the play of features, i.e. the changes in the form and appearance of the facial soft parts and organs produced by the facial mimic muscles. These changes often occur extremely rapidly, and from the standpoint of time, they usually precede the spoken word. In the present work, we will primarily dwell on the mimic muscles of the face.

General principles

In the main, the mimic musculature (see Fig. 29) is arranged around the facial orifices (eye-sockets, nasal cavity, mouth opening, and the auditory canals) in the form of circular running muscle fibres, which at contraction act constricting on the opening in question. In anatomy, this type of muscle is called sphincter. Other muscle fibres radiate from the surroundings towards the opening and at contraction can produce an expanding or pulling of the opening in the direction of each muscle. These muscles are anatomically known as dilatators (or dilators).

The mentioned changes in shape are made possible by the mimic muscles never having both origin and attachment on the skeletal basis. Both origin and attachment are either situated in the soft parts or the origin is on the skeletal basis and the attachment in the soft parts. The origin is to be regarded as more or less fixed, whereas the attachment at the contraction of the muscle moves towards the origin.

Most mimic muscles exercise their main effect on a certain organ structure. Most beautiful is the above-described muscle arrangement around the mouth opening. In man, this is the only facial orifice where the functional principles of the mimic musculature is fully retained. They have largely become lost at the other orifices. This refers particularly to the ears, which

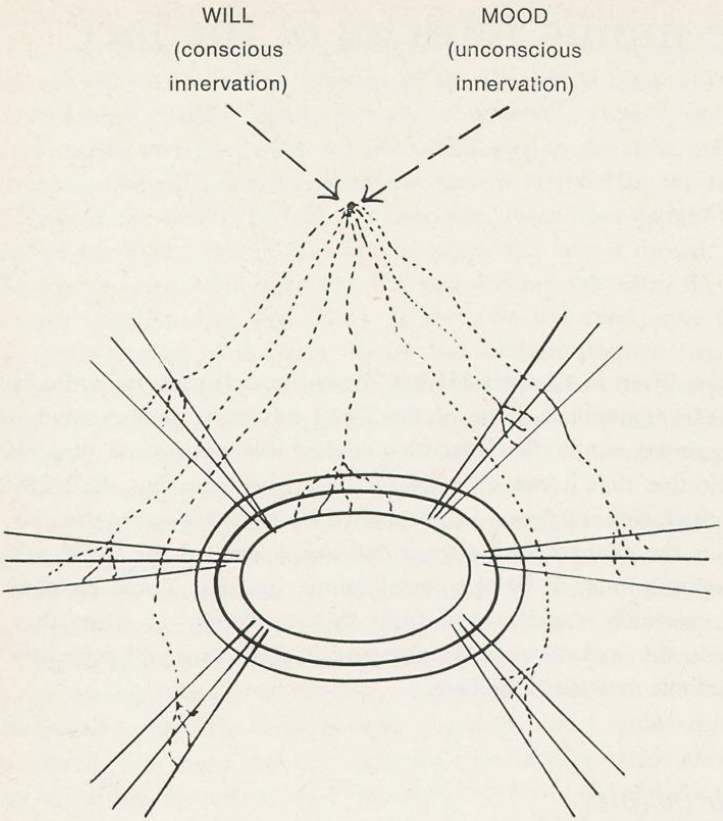

Fig. 29. Schematic presentation of the fundamental arrangement of the mimic musculature around an organ opening in the face.

can neither be constricted nor be expanded, and the nasal opening where the ability to constrict and to expand is extremely limited. The palpebral fissure can be constricted, but only insignificantly expanded.

Some mimic muscles, however, lack direct relation to any organ orifice in the face because they, instead, attach superficially in the skin, either at the place of an existing skin furrow (for instance, the nasolabial furrow; see above, Fig. 15) or at some other place. At their contraction, such muscles pull the skin region in question in direction towards their origin, whereby the possible skin furrow is deepened, displaced, or changed in form. Small skin depressions or skin hollows (cf. below, "the dimple") can also appear at the muscle's attachment in the skin. However, the soft parts situated between the muscle's origin and attachment are also affected. They can be pressed together, bulging, furrowed, folded, or displaced in their entirety. If the latter occurs, soft part regions can also be affected in

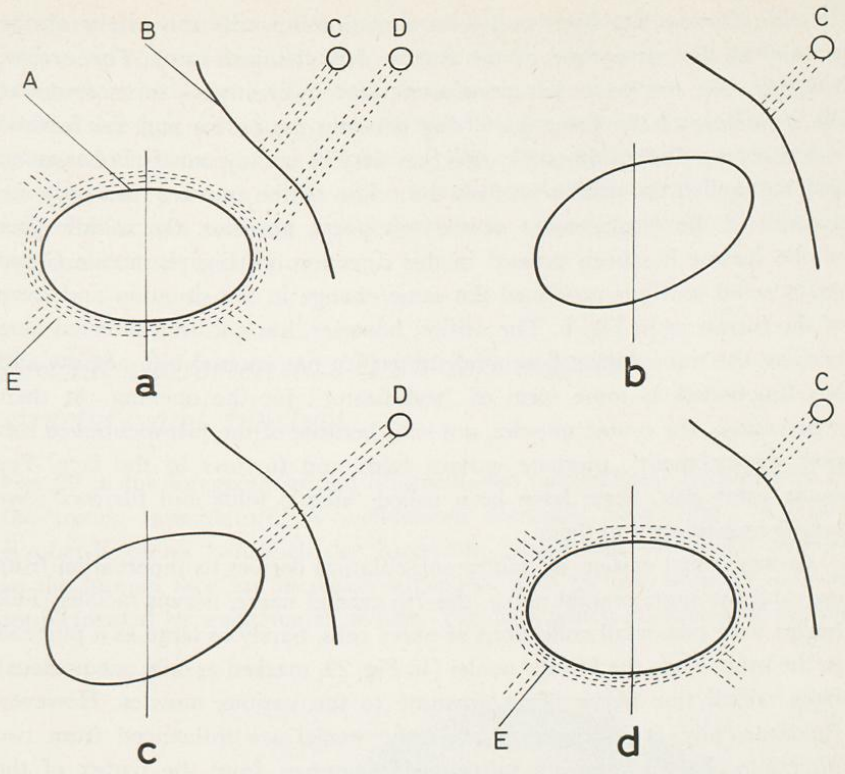

Fig. 30. Schematic presentation of a mimic muscle play (see text).

various ways in the surroundings. Both stretchings and compressings with further changes caused by these can appear. Such soft part displacements play an extremely important role as side effects of the direct muscle effects, but strangely, these have earlier hardly attracted any attention. With the aid of a schematic drawing, a muscle play is shown here, as it has fundamental interest for future analyses.

In Fig. 30 a, A is an orifice and B a skin furrow. The orifice is surrounded by musculature E, consisting of a sphincter and a few indicated dilatators. A muscle C runs from its origin (marked with a circle) in direction towards the orifice, but does not reach this; instead, it attaches itself in the skin furrow. Another muscle D runs parallel to C, but passes the skin furrow without attaching itself in this and reaches the orifice, where it attaches itself. This muscle D is thus one of the real dilatators of the orifice. In Fig. b, only muscle C has acted, with the result that the middle part of

the skin furrow has been pulled in direction towards the origin of the muscle, at the same time as the furrow has changed form. The orifice, however, has not been left unaffected, but indirectly — on account of the stretching of the tissue part lying between the orifice and the furrows — has been pulled in the same direction. In Fig. c, only muscle D has acted and has pulled the orifice towards the origin of the muscle. Indirectly, on account of the displacement of the soft parts, however, the middle part of the furrow has been pressed in this direction. In Fig. d, muscle C has again acted and has produced the same change in the situation and form of the furrow as in Fig. b. The orifice, however, has not been affected here because the musculature E around the orifice has entered into activity and has functioned as some form of "stabilizator" for the opening. At their contractions, the mimic muscles, not least because of the just-mentioned soft part displacements, produce various folds and furrows in the face. For many years past, these have been called "mimic folds and furrows"; we return immediately to them.

As mentioned earlier, all mimic musculature derives its innervation from one and the same cranial nerve, the 7th cranial nerve, nervus facialis. This begins with two small collections of nerve cells, barely as large as a pinhead in the brain stem, the facialis nuclei (in Fig. 29, marked as only one nucleus) from which fine nerve fibres emanate to the various muscles. However, fundamentally, it is important that the nuclei are influenced from two directions. Partly, they are influenced by nerves from the cortex of the brain, wherein the conscious nerve impulses originate. It is thus possible, for instance, consciously to shape the mouth in various ways and to mime different facial expressions. Partly, the nuclei are influenced by different mental centres where the emotions are experienced. The slightest change of mood therefore characterizes purely automatically and unconsciously the mimicry, unless we consciously — i.e. by an act of will — try to check and break the emotionally produced impulses. This matter concerning the influence of various emotional conditions on the mimicry, however, has already been discussed in the Introduction.*

When the innervation of the muscles ends — whether this occurs consciously or unconsciously — the muscle contractions also end and the thereby produced mimic expression disappears. In children and youths, the furrows and folds created by the play of facial features also fade away and become smoothed out owing to the general elasticity of the skin in younger ages. But the older the person becomes, the more these qualities of the skin are lost. To this is added certain tissue replacements at the places of the furrows and folds. Their tendency to remain therefore becomes increasingly obvious with the passage of time. To the extent that a certain

* The neuro-anatomical basis of emotional life has been analysed in detail by the Swede Folke Löfgren (1961, 1967).

mimicry, which can have been produced by a certain mood, has particularly often marked a face, the folds and furrows created by the mimicry in question, which tend to become increasingly permanent, can therefore endow the face with an expression that is a reminiscence or reflex of the mood which is most often dominating. This fact, well known to all prominent portrait painters, is naturally of the greatest importance in connexion with the artist's difficult and delicate task of endeavouring to obtain a personality interpretation.

Special characteristics with reference to structure and function

Fig. 29 in the foregoing section illustrates the fundamental arrangement of the mimic musculature. A well-known textbook plate (Fig. 31, from Rauber-Kopsch's Lehrbuch der Anatomie) shows how the mimic muscles in the human face are in reality arranged. This picture, however, will be supplemented by a schematic picture (Fig. 32), which illustrates the course

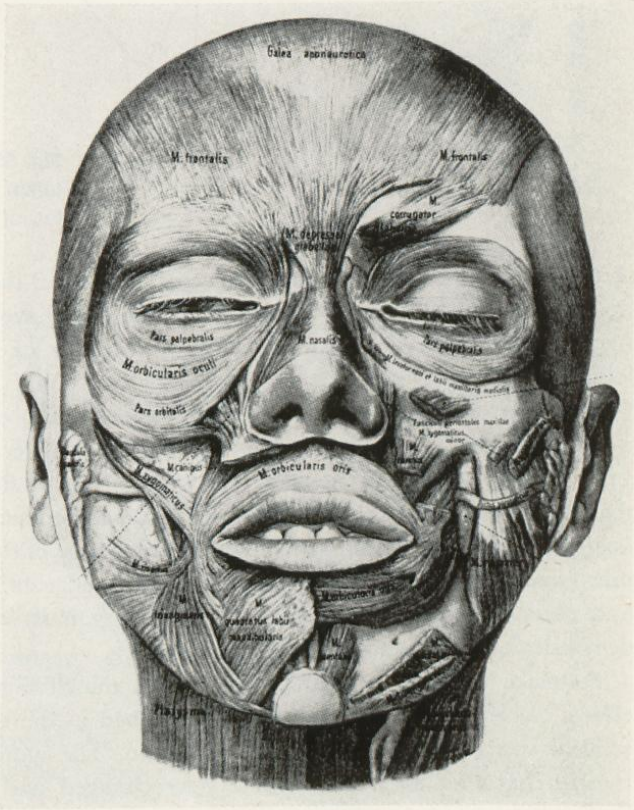

Fig. 31. The mimic muscles of the face (according to A. Rauber & Fr. Kopsch 1955).

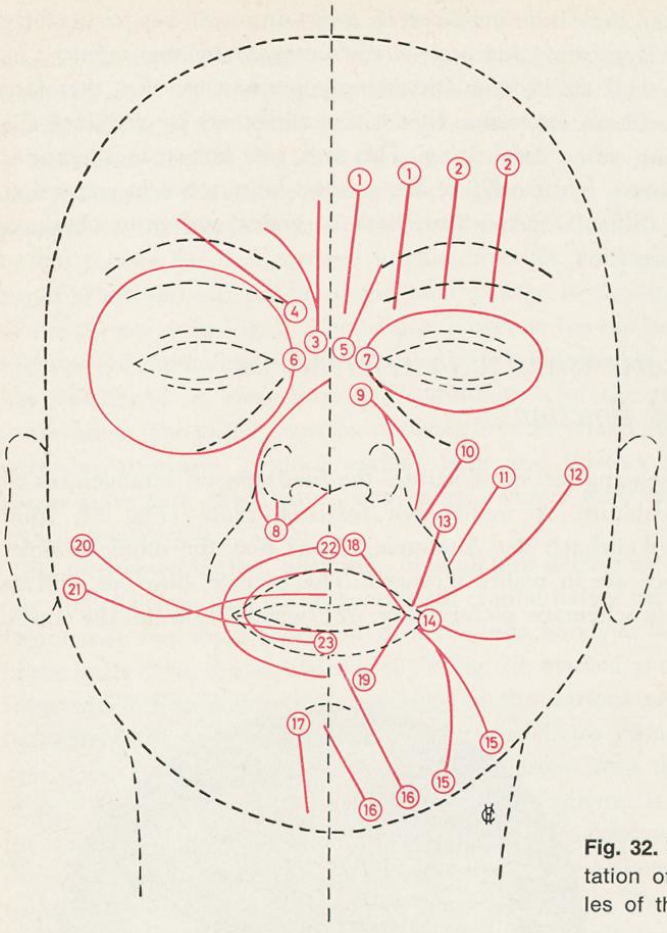

Fig. 32. Schematic presentation of the mimic muscles of the face.

of the various muscles (in red). The small circles on the drawing indicate the more or less fixed points where the muscles have their origin. The figure within each circle agrees with the number of the muscle in the following survey.

Most anatomical textbooks usually present a group classification of the mimic muscles. For instance, they mention the muscles of the roof of the skull, of the eye, of the nose, of the mouth, and of the external ear. In the following, the author has deliberately abandoned such or similar classification, because at the mimic analysis, the recording of the above-mentioned side effects is often as important as the knowledge of the main function and main effect of a muscle on a certain organ structure. This will be demonstrated in numerous ways in the following.

To make the matter clearer, the various muscle functions and muscle effects of each individual muscle are described in the text under the anatomical structures and regions they refer to. The names of the different muscles have on several occasions been changed and unfortunately not

always for the better. Below, the most usual names are used, but to avoid misunderstanding and for the use of the expert, the Latin names are put in parentheses. (The abbreviation "m" means musculus.) A few mimic muscles (among others, the platysma, the lacrimal part of the sphincter muscle of the eye, the muscle of the neck, m. occipitalis, and the muscles of the external ear) will not be discussed as they lack interest in the present context. It must also be borne in mind that considerable individual – both anatomical and functional – variations exist. For instance, some of the muscle contractions that certain persons are able to perform cannot be done by others. Therefore, what follows must be understood with some reservation and interpreted as an attempt to describe both positively known and in most persons at least theoretically conceivable muscle functions and muscle effects.

The author readily admitts that the problem he was faced with was rather difficult when the formulation of the task had reached this stage. How could a written account of the muscle functions and muscle effects be illustrated to make them clear and photogenic to the reader? The question was particularly justified, because the primary objective of the entire muscle analysis was to try to develop a certain system of "mimic letters".

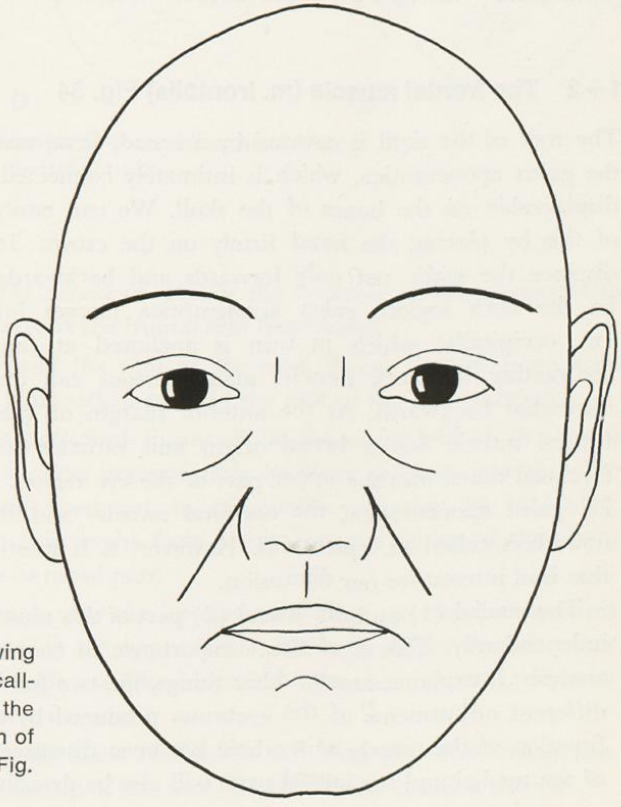

Fig. 33. Schematic drawing of frontal view of face, called "Victor", which is the basis of the presentation of the muscle effects in Fig. 34–39.

After much and varied experimenting, the author decided to consistently base his schematic illustrations on one and the same frontal picture of the face, whereon only more important facial details were marked. This picture (see Fig. 33) has in all the following discussions been called "Victor"; as can be seen, it is a simplification of that earlier shown in Fig. 15 (cf. also the table in Fig. 14).

At the description of the various muscles in the following, reference will be made to these figures:

Fig. 34 (muscles No. 1– 2);
Fig. 35 (muscles No. 3– 7);
Fig. 36 (muscles No. 8–10);
Fig. 37 (muscles No. 11–15);
Fig. 38 (muscles No. 16–19);
Fig. 39 (muscles No. 20–23).

Each of these figures contains pictures designated a and b. One a-picture is identical with "Victor". The details affected by the muscle involved are indicated by a broken line. No other violence has been carried out on "Victor", if we ignore the changes produced by the muscle marked in red. Each b-picture shows how these changes – if they occurred as isolated phenomena – affected the appearance of "Victor".

1+2 The frontal muscle (m. frontalis) Fig. 34

The roof of the skull is covered by a broad, firm, and sinewy membrane, the galea aponeurotica, which is intimately connected with the scalp, but displaceable on the bones of the skull. We can easily convince ourselves of this by placing the hand firmly on the crown. It is then possible to displace the scalp, not only forwards and backwards, but also sideways. In the neck region, galea aponeurotica merges into the neck muscle (m. occipitalis) which in turn is anchored at the occipital bone. By contracting the neck muscle, many persons can draw the entire scalp somewhat backwards. At the anterior margin of galea aponeurotica, the frontal muscle has a broad origin and radiates from there across the forehead down into the upper part of the eye region. The entire structure, i.e. galea aponeurotica, the occipital muscle, and the frontal muscle, is nowadays called m. epicranius. However, it is mostly the frontal muscle that is of interest for our discussion.

The medial (1) and the lateral (2) part of this muscle can work relatively independently. This is of great importance in connexion with the mimic analysis; it explains, among other things, the two fundamentally completely different adjustments of the eyebrows produced by the muscle. After the function of the muscle as a whole has been discussed, the special function of the medial and the lateral parts will also be described.

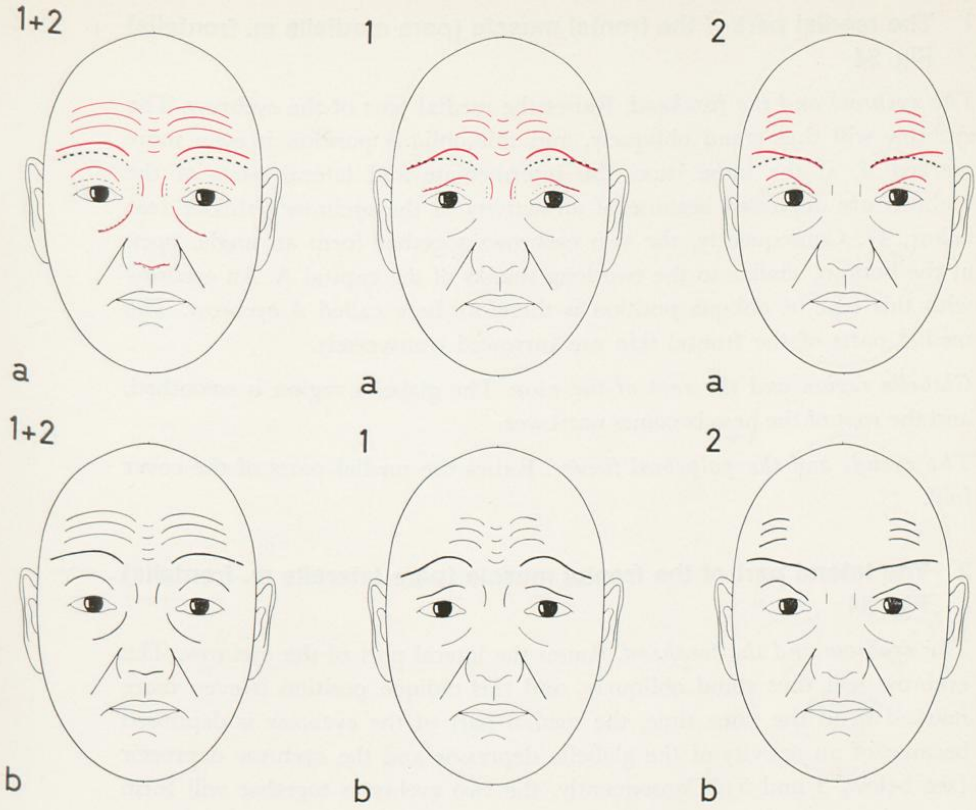

Fig. 34. Schematic presentation of the effect produced by the frontal muscle (m. frontalis, 1+2):
the medial part, 1:
the lateral part, 2.

The eyebrow and the forehead. Raises the eyebrow without appreciably changing its form. Furrows the frontal skin transversely.

The glabella region and the root of the nose. Raises the soft parts here. The glabella region is smoothed out and the root of the nose narrows.

The eyelids and the palpebral fissure. Pulls the cover fold of the upper eyelid upwards and renders imperceptible its lower revulsion margin. The palpebral fissure itself need not, in connexion with this, be expanded. Sometimes, however, this results from a simultaneous raising of the entire upper eyelid and also its tarsal part.

The infraorbital triangle and the infraorbital furrow. At extreme upwards pulling of the soft parts in the upper facial region, the upper medial corner of the infraorbital triangle can also be pulled somewhat upwards, whereby the infraorbital furrow is deepened.

The nasal region. For the same reason, the skin over the nasal bridge can be stretched down to the tip of the nose, which thereby is raised a trifle.

1 The medial part of the frontal muscle (pars medialis m. frontalis) Fig. 34

The eyebrow and the forehead. Raises the medial part of the eyebrow. The eyebrow will thus stand obliquely, and this oblique position is even more marked if, at the same time, the intermediate and lateral parts of the eyebrow are depressed because of an activity of the eyebrow wrinkler (see below, 4). Consequently, the two eyebrows together form an angle, open at the bottom, similar to the two long shanks of the capital A. An eyebrow with this type of oblique position is therefore here called A-eyebrow. The medial parts of the frontal skin are furrowed transversely.

Glabella region and the root of the nose. The glabella region is smoothed, and the root of the nose becomes narrower.

The eyelids and the palpebral fissure. Raises the medial parts of the cover fold.

2 The lateral part of the frontal muscle (pars lateralis m. frontalis) Fig. 34

The eyebrow and the forehead. Raises the lateral part of the eyebrow. The eyebrow will thus stand obliquely, and this oblique position is even more marked if, at the same time, the medial part of the eyebrow is depressed because of an activity of the glabella depressor and the eyebrow depressor (see below, 3 and 5). Consequently, the two eyebrows together will form an angle, open at the top, similar to the two shanks of the capital V. An eyebrow with this type of oblique position is therefore here called V-eyebrow. The lateral parts of the frontal skin are furrowed transversely.

The eyelids and the palpebral fissure. Raises the lateral parts of the cover fold.

3 The glabella depressor (m. procerus or m. depressor glabellae) Fig. 35

Originates in the upper part of the nasal bridge and radiates in the shape of a fan upwards into the glabella region.

The eyebrow and the forehead. Can co-operate at the depressing of the medial parts of the eyebrow. Can also bring the eyebrows closer to each other.

The glabella region and the root of the nose. Depresses the skin over the glabella region. The root of the nose becomes broader at the same time as one or more transverse furrows are produced over the root of the nose. In the literature, such a transverse furrow has sometimes been called "champion pucker". If the eyebrows have been brought closer to each other, an indication of vertical furrows can sometimes be noted.

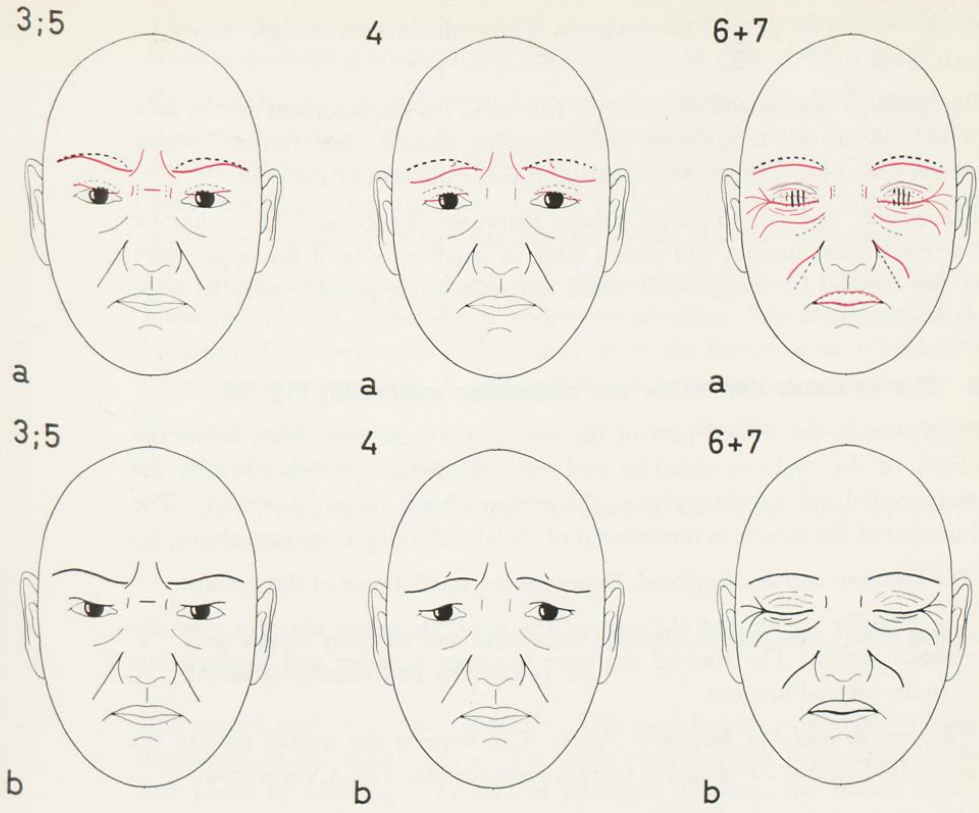

Fig. 35. Schematic presentation of the effect produced by
the glabella depressor (m. procerus or m. depressor glabellae, 3);
the eyebrow depressor (m. depressor supercilii, 5);
the eyebrow wrinkler (m. corrugator supercilii, 4);
the sphincter muscle of the eye (m. orbicularis oculi, 6+7);
the orbital part, 6;
the eyelid part, 7.

The eyelids and the palpebral fissure. If the muscle is able to depress the medial parts of the eyebrow, the soft parts lying underneath are also pressed downwards. The medial part of the cover fold is also depressed. Its revulsion margin, in that event, will run parallel with a V-eyebrow.

4 The eyebrow wrinkler (m. corrugator supercilii) Fig. 35

Originates in the lateral part of the root of the nose and radiates obliquely upwards to the skin of the forehead above the middle part of the eyebrow.

The eyebrow and the forehead. Depresses the middle and possibly also the lateral part of the eyebrow, which has an upward directed concavity. In connexion with this, there is a slight depression, the eyebrow depression,

above the middle part of the eyebrow. The eyebrows are brought closer to each other.

The glabella region and the root of the nose. By displacement of the soft parts from the side towards the glabella region, one or more vertical furrows are produced here; these extend down towards the root of the nose.

The eyelids and the palpebral fissure. Depresses the cover fold so that its lower revulsion margin will screen large or smaller parts of the upper part of the fissure. Its margin will stand horizontally or possibly parallel with an A-eyebrow.

5 The eyebrow depressor (m. depressor supercilii) Fig. 35

Originates in the lateral part of the root of the nose, somewhat below the origin of the eyebrow wrinkler and rises obliquely upwards towards the most medial part of the eyebrow, the eyebrow head (caput supercilii). The function of the muscle is reminiscent of the glabella depressor (see above, 3).

The eyebrow and the forehead. Depresses the medial part of the eyebrow.

The glabella region and the root of the nose. Depresses the skin over the glabella region. The root of the nose becomes broader and is given one or more vertical furrows.

The eyelids and the palpebral fissure. Can depress the medial part of the cover fold so that its revulsion margin runs parallel with a V-eyebrow.

6+7 The sphincter muscle of the eye (m. orbicularis oculi) Fig. 35

A short, firm, connective tissue ligament, the palpebral ligament, extends from the bony part of the root of the nose towards the inner corner of the eye. This ligament is the origin of a very large number of muscle fibres which surround the eye-socket in concentric circles. These fibres together form a round lamina or plate, which represents a muscular framework in the eyelids and their immediate surroundings. The muscle fibres belonging to the eyelids themselves are called the eyelid part (see below, 7) whereas the muscle fibres lying peripherally of it are the orbital part (see below, 6). The muscle has also a third part situated medially but deeper in, the lacrimal part; this, however, is of no interest in this discussion. The muscle mainly acts constricting on the palpebral fissure similar to a sphincter muscle. In connexion with this, the soft parts in the immediate surroundings are pulled towards this fissure in a manner seen in more detail below.

6 The orbital part of the sphincter muscle of the eye (pars orbitalis m. orbicularis oculi) Fig. 35

The eyebrow and the forehead. Can at strong effect depress the eyebrow, especially its lateral part.

The glabella region and the root of the nose. Can at extreme effect depress the skin over the glabella region and broaden the root of the nose.

The eyelids and the palpebral fissure. Contracts the palpebral fissure, and at extreme activity, this becomes tightly screwed up and is covered and surrounded by compressed soft parts. In connexion with this, furrows and folds, the lateral eye furrows, "crow's foot", appear at the lateral corner of the eye, radiating fanlike towards the temple and down the cheek.

The infraorbital triangle and the infraorbital furrow. Raises the infraorbital triangle, especially its upper lateral corner. The lower part of the infraorbital furrow is also raised, which gives the furrow a more horizontal course at the same time as its upwards directed concavity is emphasized.

The nasolabial furrow. At extreme effect, the nasolabial furrow can also be somewhat raised and deepened.

The mouth opening and the lips. At extreme effect the upper lip can be somewhat raised.

7 The eyelid part of the sphincter muscle of the eye (pars palpebralis m. orbicularis oculi) Fig. 35

The eyelids and the palpebral fissure. This muscle part produces the rapid depressing of the tarsal part of the upper eyelid, which is involved in the first phase of blinking. The second phase of blinking, the return of the tarsal part to its initial position, is produced by a special muscle, the levator of the upper eyelid (m. levator palpebrae superioris; cf. the vertical sections through the eye in Fig. 17 above). This muscle, however, does not belong to the mimic muscles. At an increased activity in the eyelid levator, the palpebral fissure can also be dilated beyond the normal (cf. above). If the eyelid part is contracted more slowly, the fissure is closed by a depressing of the upper and a raising of the lower eyelid margin. This occurs, for instance, when we screw up our eyes to protect them from the sun.

8 The nasal muscle (m. nasalis) Fig. 36

The muscle originates in the anterior lower part of the upper jaw, more precisely in the region above the lateral incisor and the canine. From there, the muscle fibres rise upwards and merge into three muscle portions. The largest of these runs laterally upwards, close to the nasal wing; higher up, it curves medially and combines across the nasal bridge with the corresponding muscle portion on the other side. It has therefore been called pars transversa. The other two smaller portions attach themselves at the lower part of the nasal wing and the nasal septum, respectively, and have therefore been called pars alaris and pars septalis, respectively. The effect of

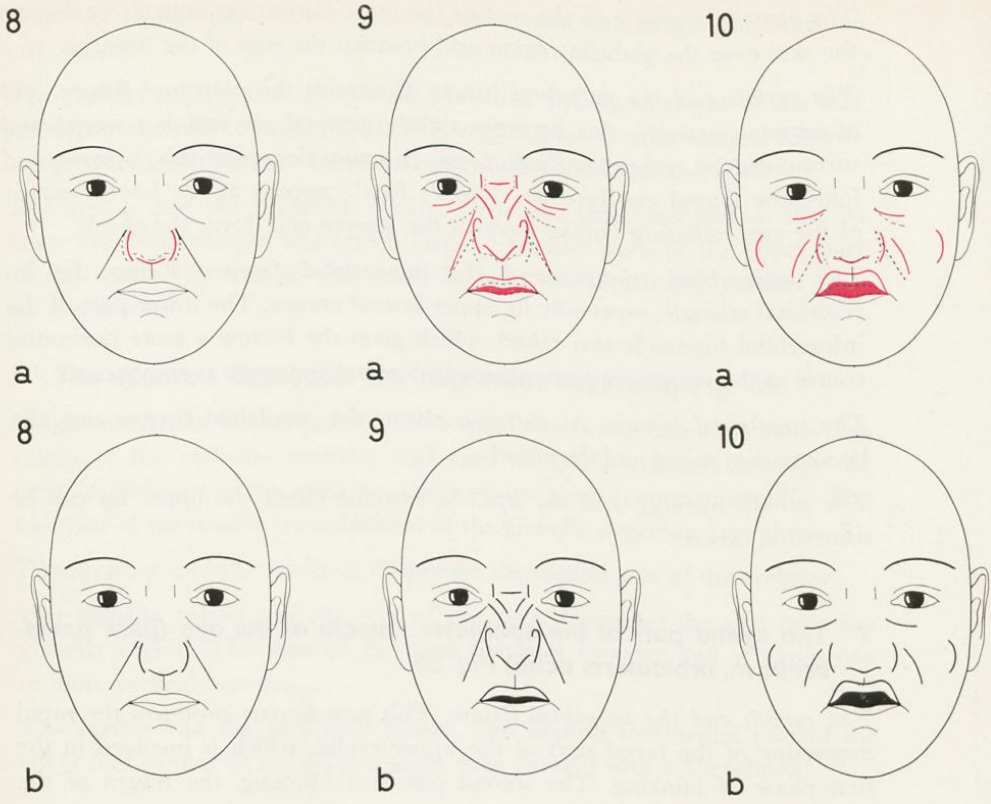

Fig. 36. Schematic presentation of the effect produced by
the nasal muscle (m. nasalis, 8);
the upper lip and the nasal wing levator (m. levator labii superioris alaeque nasi, 9);
the upper lip levator (m. levator labii superioris, 10).

the muscle is restricted to the nasal region, but is of no particular importance in man.

The nasal region. In man, pars transversa lacks the ability to constrict the nasal opening. However, it presses the nasal wing medially. The width of the nostril is reduced at the same time as the posterior nasal wing furrow is deepened. The two smaller portions depress the nasal wing and the lower part of the nasal septum, respectively.

9 The upper lip and the nasal wing levator (m. levator labii superioris alaeque nasi) Fig. 36

In earlier nomenclatures, this muscle has been called caput angulare of m. quadratus labii superioris. The muscle originates in the frontal process of the upper jaw, somewhat below the palpebral ligament mentioned in connexion with the sphincter muscle of the eye. From its origin, the muscle

fibres run downwards in the form of an arc and attach themselves in the lower margin of the nasal wing and in the upper part of the nasolabial furrow.

The glabella region and the root of the nose. The root of the nose broadens somewhat. Transverse furrows are formed. (See otherwise under the nasal region.)

The infraorbital triangle and the infraorbital furrow. The upper medial corner of the infraorbital triangle is pulled upwards. The infraorbital furrow is also raised and deepened.

The nasolabial furrow. Raised and deepened.

The nasal region. The muscle fibres that attach themselves in the nasal wing pull this upwards. But the accuracy of the old concept that the nostril is always dilated by this muscle activity can be disputed. In connexion with the raising of the infraorbital triangle, "nasal bridge swellings" occur at the side of the nasal bridge. Immediately below the root of the nose, folds and furrows are formed on the nasal bridge; these radiate in fanshape upwards. The most lateral of these furrows delimits "the nasal bridge swellings" upwards-medially.

The mouth opening and the lips. When the nasolabial furrow is raised and deepened, the lateral parts of the upper lip can also be raised (unless this is counteracted by the sphincter muscle of the mouth, see below, 23). The middle part of the upper lip also can be raised.

10 The upper lip levator (m. levator labii superioris) Fig. 36

In earlier nomenclature, the muscle has been called caput infraorbitale of m. quadratus labii superioris. It originates somewhat below the middle part of the lower margin of the eye-socket and runs downwards and somewhat medially and attaches itself in the middle part of the nasolabial furrow.

The infraorbital triangle and the infraorbital furrow. Influenced by the nasolabial furrow (see below) the infraorbital triangle is somewhat raised and curved forwards.

The nasolabial furrow. The upper and middle part of the furrow is pulled upwards-laterally at the same time as the furrow is deepened and gets a medially directed concavity.

The nasal region. The lower part is somewhat increased in breadth.

The mouth opening and the lips. Influenced by the nasolabial furrow, the lateral parts of the upper lip are also pulled upwards-laterally. Its middle part is raised too. An angular bend of the lower part of the upper lip contour is produced. The mouth is opened a little. The now mentioned change in position and form of the upper lip can be prevented by the sphincter muscle of the mouth (see below, 23).

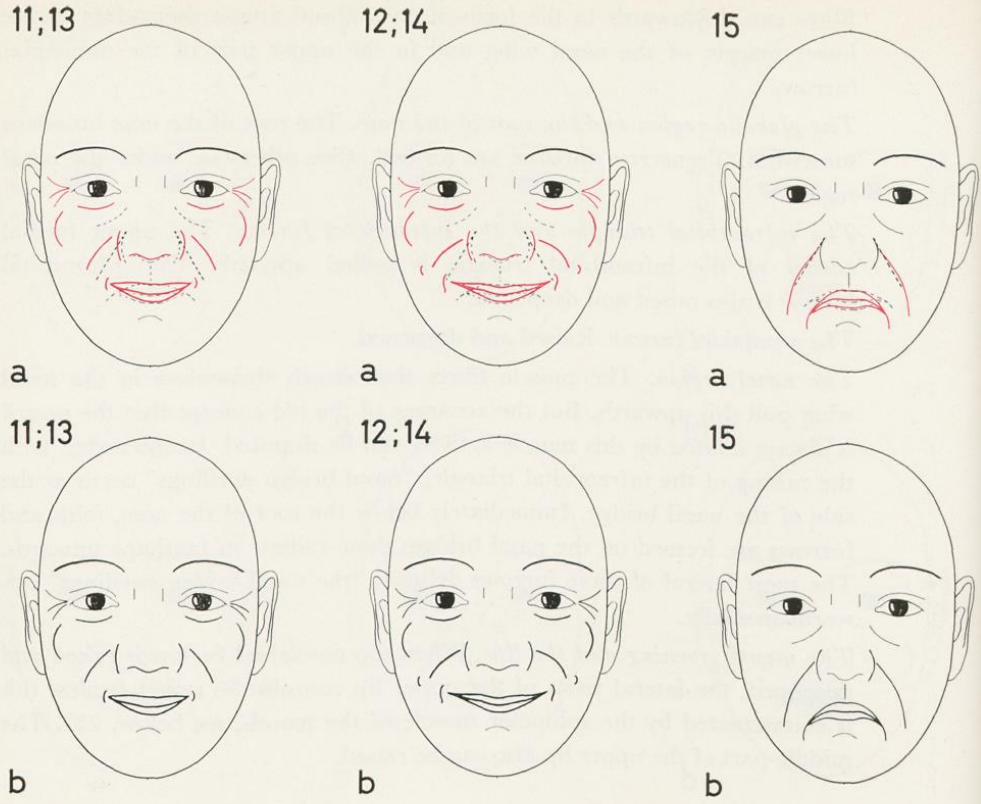

Fig. 37. Schematic presentation of the effect produced by
the lesser zygomatic muscle (m. zygomaticus minor, 11);
the levator of the angle of the mouth (m. caninus, 13);
the greater zygomatic muscle (m. zygomaticus major, 12);
the smiling muscle (m. risorius, 14);
the depressor of the angle of the mouth (m. triangularis, 15).

11 The lesser zygomatic muscle (m. zygomaticus minor) Fig. 37

In earlier nomenclature, this muscle has been called caput zygomaticum of m. quadratus labii superioris. The muscle begins laterally of the former: it has its origin in the anterior part of the zygomatic bone and thereafter runs obliquely downwards-medially to the lower part of the nasolabial furrow.

The eyelids and the palpebral fissure. Through the upwards pressure of the infraorbital triangle (see below) the muscle contributes to the creation of the lateral eye furrows.

The infraorbital triangle and the infraorbital furrow. Influenced by the nasolabial furrow (see below) the infraorbital triangle is pressed upwards

and curved forwards. The infraorbital furrow is deepened and becomes horizontal.

The nasolabial furrow. The lower part of the furrow is pulled laterally-upwards. The mouth opening increases in breadth and deepens.

The nasal region. The lower part of the nose increases in breadth. Possibly in connexion with this, the nostrils can be expanded.

The mouth opening and the lips. Influenced by the lower part of the nasolabial furrow, the mouth angle can be pulled laterally-upwards (unless this movement effect is counteracted by the sphincter muscle of the mouth, see below, 23). The mouth opening increases in breadth and is given an upwards directed concavity. The median groove on the upper lip (philtrum) becomes shallow or is smoothed out completely.

12 The greater zygomatic muscle (m. zygomaticus major) Fig. 37

The muscle runs from the outside of the zygomatic bone to the lateral angle of the mouth.

The eyelids and palpebral fissure. Being pulled upwards-laterally by the lateral angle of the mouth, the infraorbital triangle becomes pressed upwards (see below) whereby the muscle contributes to creating lateral eye furrows.

The infraorbital triangle and the infraorbital furrow. The infraorbital triangle is pressed upwards and curved forwards. The infraorbital furrow is deepened and has a horizontal course.

The nasolabial furrow. The lower part of the furrow is pulled laterally-upwards and deepened.

The nasal region. The lower part of the nose is increased in breadth. Possibly the nostrils, in connexion with this, can be expanded.

The mouth opening and the lips. The lateral angle of the mouth is pulled laterally-upwards. The mouth opening increases in breadth and is given an upwards directed concavity. The depression at the mouth angle is deepened. The groove on the upper lip (philtrum) becomes shallower or is completely smoothed out.

13 The levator of the angle of the mouth (m. caninus) Fig. 37

In more recent nomenclature, the muscle is called m. levator anguli oris. It originates in a depression on the front of the upper jawbone, somewhat below the origin of the upper lip levator (10), runs medially-downwards, and attaches itself at the angle of the mouth.

The nasolabial furrow. Raises and deepens the lower part of the furrow.

The mouth opening and the lips. Pulls the angle of the mouth upwards and somewhat laterally.

14 The smiling muscle (m. risorius) Fig. 37

Originates in the angle of the mouth, runs in a weakly-arched course laterally, and attaches itself only superficially in the infraorbital triangle, somewhat lateral of the nasolabial furrow. The name is somewhat misleading: the muscle has no greater importance in the mimicry of smiling.

The infraorbital triangle and the infraorbital furrow. Under tension, the muscle produces a small depression, the dimple, where it is attached.

15 The depressor of the angle of the mouth (m. triangularis) Fig. 37

In more recent nomenclature, the muscle is called m. depressor anguli oris. Its origin is broad in the margin of the lower jaw, lateral of the chin boss and rises towards the angle of the mouth.

The nasolabial furrow. The lower part of the furrow is deepened and extended downwards.

The mouth opening and the lips. Pulls the angle of the mouth downwards and gives the mouth opening a curve with a downwards directed concavity. Deepens the depression at the angle of the mouth.

16 The lower lip depressor (m. depressor labii inferioris) Fig. 38

In more recent nomenclature, the muscle is called m. quadratus labii inferioris. It originates in the same way as m. triangularis (15) and is partly covered by this. The muscle fibres thereafter rise upwards-medially to the lower lip. The most medial fibres connect with the corresponding muscle fibres on the other side in the middle of the chin.

The nasolabial furrow. The lower part is extended somewhat downwards and deepened.

The mouth opening and the lips. Pulls the lower lip downwards and somewhat laterally, whereby the lip is tightened. The mouth is opened slightly at the same time.

The chin. Smooths out the soft parts over the chin boss and increases them in breadth. Extends, but at the same time reduces the depth of, the chin-lip furrow.

17 The chin muscle (m. mentalis) Fig. 38

The muscle originates in the front part of the lower jaw, somewhat below the incisors. From there, the muscle runs downwards and attaches itself in the skin of the chin.

The mouth opening and the lips. By raising the soft parts over the chin boss (see below) the muscle also presses the lower lip upwards.

The chin. The soft parts over the chin boss are tightened to a rounded swelling, which is raised upwards. Thereby, the chin-lip furrow is also emphasized.

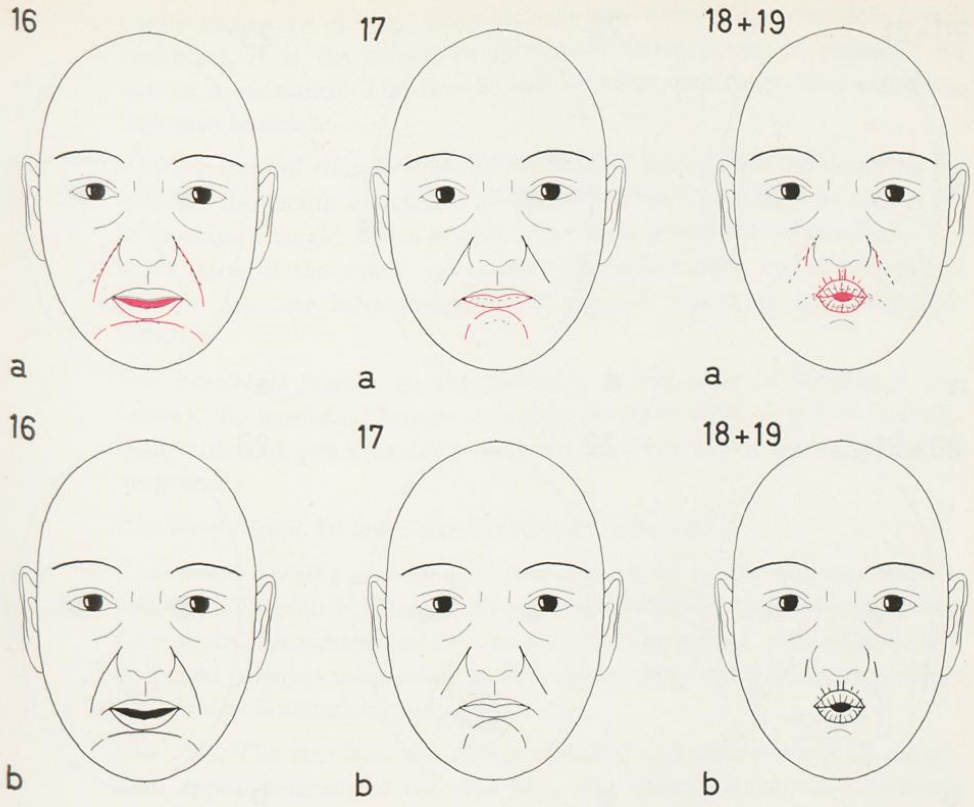

Fig. 38. Schematic presentation of the effect produced by
the lower lip depressor (m. depressor labii inferioris, 16);
the chin muscle (m. mentalis, 17);
the incisive muscles of the upper and lower lips (mm. incisivi labii superioris et inferioris, 18+19).

18+19 The incisive muscles of the upper lip and the lower lip (mm. incisivi labii superioris, 18, et inferioris, 19) Fig. 38

Originate in the front of the upper jaw and the lower jaw, respectively, from a small region above and below the lateral incisor and attach themselves at the angle of the mouth.

The nasolabial furrow. Because of the effect on the mouth opening (see below) the lower part of the nasolabial furrow is weakened or completely smoothed out.

The mouth opening and the lips. Pulls, at co-operation, the angle of the mouth medially. The mouth opening becomes small and rounded, as when pronouncing the vowel in the word fool. The median groove on the upper lip (philtrum) is emphasized.

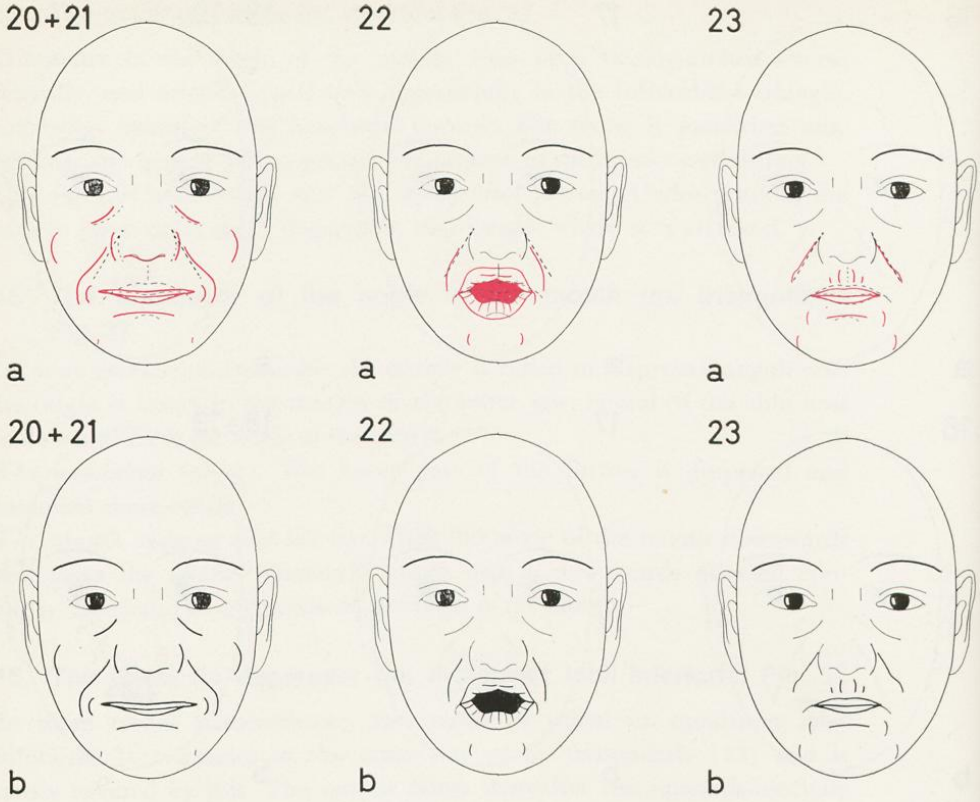

Fig. 39. Schematic presentation of the effect produced by
the cheek muscle (m. buccinator, 20+21);
the lower lip part, 20;
the upper lip part, 21;
the sphincter muscle of the mouth (m. orbicularis oris, 22+23);
the lip part, 22;
the marginal part, 23.

20+21 The cheek muscle (m. buccinator) Fig. 39

The muscle has a broad origin lying far back in the deepest parts of the cheek, more precisely in the vicinity of the teeth lying farthest back in the upper and lower jaws, and in a special connective tissue ligament (ligamentum pterygomandibulare). From here, the muscle fibres run as a broad band towards the mouth opening, where they merge into the latter's circular musculature (see below). The upper muscle fibres (20) merge into the lower lip; the lower muscle fibres (21) merge into the upper lip. The muscle represents a muscular framework in the chin and thereby also in the lateral wall of the cavity of the mouth. It plays an important role in retaining food between the rows of teeth during chewing. It is

highly important at, e. g., glass blowing and trumpet blowing. When it is expanded, it is the mouth cavity's most active power in expelling air against a resistance. The muscle has therefore sometimes been called the "trumpet muscle".

The infraorbital triangle and the infraorbital furrow. The influence on the angle of the mouth affects the nasolabial furrow (see below) as well as the infraorbital triangle, which is pressed backwards and curved outwards. The inner parts of the cheek are tensed. The upper parts of the infraorbital triangle and the infraorbital furrow do not appear to be appreciably affected.

The nasolabial furrow. By the influence on the angle of the mouth (see below), the nasolabial furrow, especially its lower parts, is pulled laterally-backwards and gets a medially open angular bend at the same time as it is deepened.

The nasal region. Its lower part is increased in breadth.

The mouth opening and the lips. The angle of the mouth is drawn laterally and slightly upwards. The mouth opening is thereby extended at the same time as the lips tighten and become thinner. The mouth angle depression is deepened, whereas the median groove on the upper lip (philtrum) becomes shallower or is completely smoothed out.

The chin. The skin over the chin is stretched and sometimes small depressions appear laterally of the chin boss. The chin-lip furrow is broadened, but at the same time becomes less marked.

22+23 The sphincter muscle of the mouth (m. orbicularis oris) Fig. 39

With its muscle fibres arranged in concentric circles around the mouth opening, the muscle closely resembles the sphincter muscle of the eye (6+7). The part of the muscle that belongs to the red parts of the lips is called the marginal part (pars marginalis, see below, 23) whereas the part situated peripherally of it in the skin parts of the lips is called the lip part (pars labialis, see below, 22). The muscle fibres of the lip part together form a muscular plate, which extends in the main in a plane standing vertically, parallel with the frontal plane of the face. The muscle fibres of the marginal part in the upper lip and in the lower lip form a band that stretches from one angle of the mouth to the other in the horizontal plane. Moreover, small, fine, muscle fibres (musculi recti) are present in the lips and run from the skin part of the lip obliquely downwards-backwards (in the upper lip), as well as upwards-backwards (in the lower lip), to the mucous membrane. They are responsible for finer changes in the shape of the lips; however, they will not be discussed more fully here.

In the main, the muscle contracts the mouth opening in a sphincterlike manner; it is also able in other ways to change its form and appearance. It is of fundamental importance that the muscle, through its tension, is able to counteract the change in shape of the mouth opening, which dilatators acting from outside could create. When, for instance, it is pointed out in the foregoing that m. zygomaticus minor by pulling the lower part of the nasolabial furrow laterally-upwards also pulls the angle of the mouth in this direction, the latter effect fails to appear if m. orbicularis oris is brought into function (cf. also above, Fig. 30 d). If the lips are to be put under tension, the angle of the mouth must be kept in place by the dilatators attached there being brought into action. This explains the side effects on the nasolabial furrow and the chin that can be produced by pars marginalis (see below).

22 The lip part of the sphincter muscle of the mouth (pars labialis m. orbicularis oris) Fig. 39

The nasolabial furrow. Its lower part is extended and carried medially.

The mouth opening and the lips. Constricts the mouth opening. Tightens the skin parts of the lips. If the red parts of the lips are not tensed, they shoot out in a funnel-shaped way as when pronouncing the word flirt. If the red parts are somewhat tensed, the mouth takes on the appearance as when pronouncing the word fool.

23 The marginal part of the sphincter muscle of the mouth (pars marginalis m. orbicularis oris) Fig. 39

The nasolabial furrow. A slight depression appears at its lower part, caused by the increased tension in the tissue.

The nasal region. If the upper lip is rolled inwards under the upper incisor margin (see below), the lower soft parts of the nose are pulled downwards.

The mouth opening and the lips. Constricts the mouth opening. Tightens the red parts of the lips as when pronouncing the consonant P. Can at somewhat extended mouth opening "roll in" the tensed lips between the rows of teeth. Depresses the upper lip and raises the lower lip, and increases the height of the upper lip. Small furrows appear on the upper lip.

The chin. Smoothed out through simultaneous tension, probably in m. triangularis and in the lower lip depressor (cf. above).

* *
*

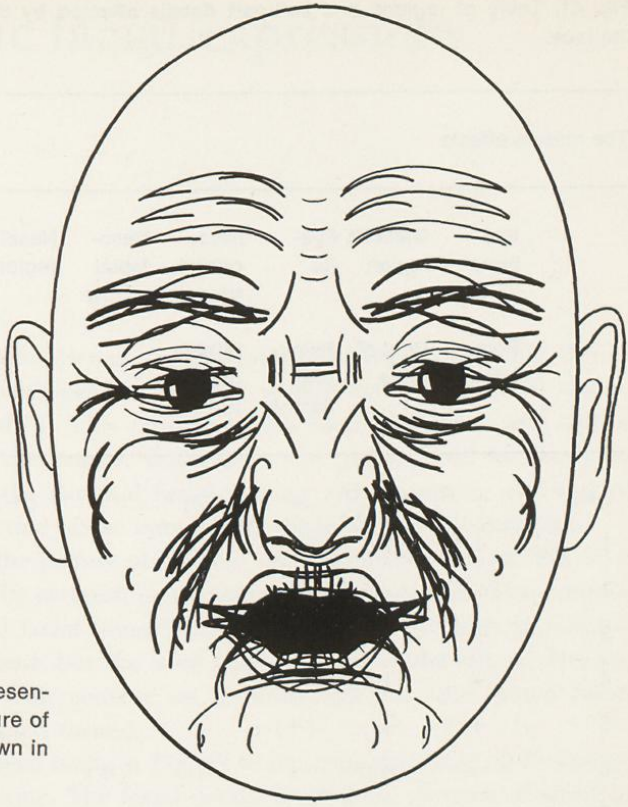

Fig. 40. Schematic presentation in a single picture of all muscle effects shown in Fig. 34–39.

In a highly varied manner, the different mimic muscles can thus influence the facial picture and its various details. This is beautifully illustrated if the muscle effects now described and shown in the figures 34–39 are combined into one single picture. This has taken place in Fig. 40, which was obtained by superimposing all the figures. However, it must be pointed out that the muscle effects marked on all the drawings are only intended to show what each muscle can, in the main, produce. Thus they must not be interpreted either as "maximum effects" or "minimum effects". Naturally, they only illustrate a purely static condition and not a dynamic one.

Fig. 41 presents a table from which can be seen the regions and facial details affected by the various mimic muscles.

Fig. 41. Table of regions and soft-part details affected by the mimic muscles of the face.

The muscle affects	Eye-brow	Glabella region	Eye-lid	Infra-orbital triangle	Naso-labial furrow	Nasal region	Mouth opening	Chin
	Fore-head	Root of nose	Palpe-bral fissure	Infra-orbital furrow			Lips	
1+2	+	+	+	(+)		(+)		
1	+	+	+					
2	+		+					
3	+	+	(+)					
4	+	+	+					
5	+	+	(+)					
6	+	(+)	+	+	(+)		(+)	
7			+					
8						+		
9		(+)		+	+	+	(+)	
10				+	+	+	+	
11			+	+	+	+	+	
12			+	+	+	+	+	
13					+		+	
14				+				
15					+		+	
16					+		+	+
17							+	+
18+19					+		+	
20+21				+	+	+	+	+
22					+		+	
23					(+)	(+)	+	+