

SMITHSONIAN MISCELLANEOUS COLLECTIONS

VOLUME 85, NUMBER 10

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(WITH FIVE PLATES)

BY

GERRIT S. MILLER, JR.

Curator, Division of Mammals, U. S. National Museum



(PUBLICATION 3130)

CITY OF WASHINGTON
PUBLISHED BY THE SMITHSONIAN INSTITUTION
DECEMBER 19, 1931

The Lord Baltimore Press
BALTIMORE, MD., U. S. A.

HUMAN HAIR AND PRIMATE PATTERNING

By GERRIT S. MILLER, JR.,

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(WITH FIVE PLATES)

Few problems have caused more perplexity to anthropologists, physicians, and zoologists than those presented by human hair. Why is it that only some relatively small areas of the human skin are normally capable of bearing a hair growth dense enough to be in any way comparable with the fur of other mammals? Why do men have beards and women not? Why are beards better developed in some races than in others? What is the cause of baldness, and why is there no certain cure for it? Why does baldness commonly occur on the crown and rarely on the sides of the head? Why do we turn gray? Why does grayness usually show itself first on the temples or in the beard? Why does the moustache often remain dark after the beard has turned gray? Why do we have hairy eyebrows, and why, when there is a difference in color between the hair of the eyebrows and that of the head, are the eyebrows usually the darker of the two? Why is the hair of the scalp often different in quality from that of other parts of the body? Why are there several types of hair—kinky, curly and straight?

To all of these questions so many and such unsatisfying answers have been suggested that it would be a huge and useless task to try to list them. Variable and inconclusive though they are, most of the answers possess one quality in common, namely, they have in their background the tacit assumption that all these peculiarities of human hair are things that arise from man's special constitution and its reaction to the natural environment or to the artificial conditions that man has imposed upon himself. It has, for instance, been urged that the general bareness of the human skin comes from the widely prevalent habit of wearing clothes; that baldness comes from barbers and tight-fitting hats; that women have less baldness than men because women have for centuries taken better care of their scalps than men have; that graying hair is the result of a lessening bodily energy supposed to go with increasing civilization or "domestication;" that the axillary and pubic tufts of hair were once useful for babies to

cling to; that eyebrows exist for the purpose of keeping sweat from running down into the eyes; that men are bearded to protect their throats from cold weather; that women are beardless because they look better that way. All of which gives evidence of ingenuity if of nothing else.

But not one of the explanations that I have been able to find in print has taken into consideration the zoological possibility that many features of the human hair system may be generalized primate traits instead of specifically human developments. By this I mean the possibility that they may be characteristics that are forced on man because they are common property of the Primates, the animal group to which man pertains. Their explanation, in that event, would have to be made less in terms of human activities and requirements than in terms of the great heritage of characteristics that man shares with all his primate relatives. Each one of these creatures has modified his portion of this heritage in such a way as to make it his own; or, in more technical language, each one of the 800-odd kinds of living apes, monkeys, and lemurs has developed "specific" characters by which it can be distinguished from all the others while remaining none the less a primate among primates. That man should have done the same thing would be far from strange.

This paper is a brief summary of a study on which I have been engaged for several years with the result that I have become convinced that the chief peculiarities of human hair are best and most simply explained as special examples of primate "patterning."

WHAT IS MEANT BY "PATTERNING"

Patterning is familiar to every systematic zoologist because it is seen in every group of animals. It consists in the arrangement of (a) contrasted colored areas on the surface of the body, or (b) contrasted long and short outgrowths from the surface of the body, or (c) combinations of colors and outgrowths, in such a manner that the resulting patterns of color or form are sufficient to distinguish one related species from another.

Familiar examples of patterning are furnished by the color markings of butterflies, or of the American wood warblers, by the minute surface sculpture on the shells of some mollusks, and by the spiny outgrowths on the back and head of the different species of iguana and horned-toad. Among mammals, striking instances are provided by cats and squirrels with their diverse stripes, spots, mottlings, and plain colors, and by African antelopes with their stripes and spots as well as their maned necks, fringed throats and briskets, and tufted tails.

The making of patterns appears to be a process quite distinct from that by which a general harmonizing of animals with their natural surroundings has been effected. Nearly allied, pallid, desert species, for instance, may be distinguished from each other by details of individual pattern as obvious as those that serve to mark richly colored species living in humid forests. General types of color and surface may have their relations to the surroundings in which animals pass their existence; but the special patterns of the species that conform to any one type cannot be shown to have such relations. It may be plausibly argued that the blotched and spotted color schemes of arboreal warblers and the streaked color schemes of grass-living finches have something to do with the unlike surroundings in which warblers and finches pass their lives. But this argument would not apply to the differences between the patterns of Blackburnian and black-throated green warblers nesting together among the same ever-greens, nor to those between savannah and grasshopper sparrows living in one meadow. Still less would it be possible to explain, on grounds of special needs, why species of horned-toad differ from each other in the number and form of the spiny outgrowths on the head, or why one species of gnu has a fringe on the brisket and another has not. Patterning, therefore, seems to be something physiologically inherent in animals rather than something that the environment has imposed upon them.

PATTERNING IN PRIMATES

Though patterning occurs in all groups of mammals—even in rhinoceros, hippopotamus, elephant, and cetacean—it is among the primates that the tendency attains its greatest development. In no other group does it make such full use of its chief materials, namely, the color of the skin, the color of the hair, and the contrasts that can be obtained from differences in quality and length of hair. No better example of this process could be given than the one furnished by the head markings of monkeys grouped on Plate 1. The animals there represented are nearly related species that live under essentially uniform surroundings in the great African forest belt. No two of them have the same arrangement of dark and light areas on the head; three have conspicuous white stripes over the eye; one has a black stripe in the same place; in five the cheeks are white, while in three they are not white; one (fig. 2) is bearded, while seven are not; one (fig. 4) has a moustachelike mark of white in the skin of the upper lip; another has a boldly contrasted spot of fine white hairs on the nose. Other patterns in primates come from lengthening, shortening, and varying

the direction of growth of the hair on different parts of the crown, also from varying the length and quality of the hair on the chest, shoulders, tail, and legs, and from making contrasts, often more striking than the one seen in the white-lipped guenon shown on Plate 1, in the color of different portions of the skin itself. All of these elements of color and hair growth are combined and recombined in a variety that seems to be without end.

On no part of the primate form is patterning so conspicuously developed as on the head, where strikingly marked color designs of both hair and skin are profusely exhibited, and where tufts, beards, moustaches, whiskers, and crests are brought into varied contrast with areas of short hair and bare skin.

PATTERNING ON THE HUMAN HEAD

In conformity with this universal primate trait human patterning shows itself more conspicuously on the head than on the body or limbs.

The human head pattern is not exactly duplicated by any other primate, but all the elements that enter into it can be easily found in nonhuman members of the order. The usual head pattern of the young adult Caucasian is shown in Plate 2, Figures 1 and 2. Characteristics that both sexes have in common are the completely haired cranium, the bald forehead, nose, and upper median part of the cheeks, and the presence of a narrow transverse hairy strip on the forehead over each eye. The female's pattern differs from the male's in an extension of the bare area downward over the entire lower part of the face and sideways to the ears.

In most primates the forehead and face, except the region immediately bordering the eyes, nose and mouth, are thickly haired. The first step in the process of baring the forehead is shown by one of the Celebean macaques, *Magus hecki* (pl. 2, fig. 3). Other steps have been taken by some of the South American monkeys; while an essentially human forehead can be found in the orang (pl. 2, figs. 4, 6). The bare or nearly bare lower part of the face seen in the females of all human races, and in the males of those races in which the beard is slightly developed, is presaged by the very common occurrence among other primates of a short-haired, nearly bare area around the mouth (shown by all of the monkeys represented on pl. 1). Extensions of this bare area on the cheeks may be seen in the great apes. It is carried farther in some of the South American monkeys, culminating, apparently, in the "cotton head," *Oedipomidas oedipus* (pl. 2, fig. 5), which has reached a stage slightly more advanced than that of the human female.

Though a bare or nearly bare condition of the mouth area is the usual condition among nonhuman primates, it is not universal. Beards like those of the male Caucasian or Australian occur in the orang (pl. 2, fig. 6), in the bearded African guenon shown at the top of Plate 1, and in a South American monkey (*Pithecia chiropotes*) of which I have not been able to obtain a photograph. Moustaches are not common among primates. Even that of the full-bearded orang is poorly developed. But the South American *Mystax imperator* (pl. 2, fig. 7) goes far to make up for this deficiency. While neither moustache nor beard is peculiar to man the strong development of both together appears to be a human specialty.

Nothing exactly like the human eyebrows is known in other primates, but the brow region is one where patterns are made in great profusion. Sometimes these brow patterns take the form of light or dark stripes (as shown in pl. 1 and in pl. 4, figs. 10 and 13); sometimes they are made by lines of hair differing in quality and direction from that of the head (pl. 2, fig. 8), thus showing a near approach to the condition found in man. Human eyebrow hair, as is well known, often differs in color from the hair of the crown. In such cases (pl. 4, figs. 11, 12) it is usually darker than the crown hair, after the manner of the gray-cheeked mangabey (pl. 2, fig. 8) or the Himalayan langur (pl. 4, fig. 10); rarely if ever is it conspicuously lighter, after that of the white-browed gibbon (pl. 4, fig. 13).

This normal human pattern does not always remain constant throughout life. Changes of two kinds usually take place; and the courses of both kinds tend to follow lines that can be traced through the group of primates at large.

TURNING BALD

With arrival at full maturity a considerable percentage of human males undergo a modification of their hair pattern that serves to differentiate them still further from the females. The forehead line begins to rise, either uniformly along its entire extent (pl. 3, fig. 1), or, more commonly, by pushing back a blunt reentrant wedge on each side (pl. 3, fig. 4). Frequently a bare spot begins to form at the same time on the top of the crown (pl. 3, fig. 6), and the hair of the entire median part of the crown becomes sparse. These changes may continue until the bald forehead area has been carried back over the dome of the head, leaving a well-haired border extending around the sides and across the nape (pl. 3, fig. 8).

This series of maturity changes in the hair covering of the human male head has been the subject of endless speculation. By a few

writers it has been recognized to be, like the beard, a secondary sexual character,¹ but, so far as I am aware, no one has hitherto shown that it follows the lines laid down by the patternings of other primates. The uniform raising of the forehead line can be found as a specific character in the bald chimpanzee; it is exactly paralleled by the pattern of short and long hairs on the head of one South American monkey, *Pithecia monachus* (pl. 3, fig. 2), and by the color pattern of another, *Cebus hypoleucus* (pl. 3, fig. 3). The development of the two blunt wedges results in a pattern much like the one present in the Celebean black ape, *Cynopithecus niger* (pl. 3, fig. 5). The bald spot on top of the crown is an occasional character of the toque macaque, *Macaca pileata* (pl. 3, fig. 7). The completely developed human bald area (pl. 3, fig. 8) is perfectly outlined in the South American monkey known as *Cacajao rubicundus* (pl. 3, figs. 9 and 10). The long dark hair at the side and back of the head of this animal occupies the area that remains haired in normal human baldness, while the light hair on the median area corresponding with the human bald spot is so short and sparse that it does not conceal the skin of the scalp in the living animal (two have recently been on exhibition in the National Zoological Park). Finally it is to be noticed that the human bald area follows the outline of the dark cap of the West African gorilla (pl. 5, fig. 5) as well as that of a color pattern not infrequently seen in blond men. This pattern, (which appears to occur in women also, but is obscured by long hair) is produced by an obviously paler tint of the hair that grows on the bald-spot area. It is visible as a faint but accurate picture of the color pattern made by a bare scalp contrasted with dark side hair. At the Harvard commencement exercises of 1930 I saw it on the heads of seven of the young men awaiting the conferring of their degrees.

TURNING GRAY

Another change in the human hair that begins at or slightly after the attainment of full maturity is seen in the familiar process of turning gray; this may lead in the end to a stage when all the pigmented hairs of the entire body have been replaced by colorless ones.

This loss of color, like baldness, has given rise to conjecture without end. And, as in the case of baldness, its near relation to primate patterning seems to have passed unnoticed. Nevertheless, it can be

¹ The examination of many hundreds of photographs makes it appear probable that the males of races with strong beards tend to show the highest percentage of baldness, thus differentiating themselves most fully from the females.

shown to have the same tendency to follow the main lines of primate pattern making.

When gray hairs begin to replace the pigmented ones they do not appear uniformly all over the body. "A vigorous man just beginning to show a touch of gray on the temples" is an often-heard phrase that unconsciously recognizes this fact. When beards were common among us everyone knew how usual it was for them to turn gray before the scalp.

As they increase in numbers the gray hairs tend to form patterns. These are sometimes nothing more than faint sketches or suggestions. Often, however, they develop into striking color contrasts. The faint and fugitive human patterns are not always easy to correlate with the patterns of other primates, but the definite ones rarely present any such difficulty.

Eight of these well defined human color patterns with their primate homologues are shown on Plates 4 and 5.

The first and second (pl. 4, figs. 1 and 3), consisting of a white beard contrasted with a dark crown, are frequently seen. In the first the mouth area is white. In the second it is dark. Both occur in many species of monkey, two of which, the African *Erythrocebus pyrrhonotus* and *Cercopithecus lhoesti*, are shown in Figures 2 and 4. The identity is so obvious that it requires no comment.

The third pattern (pl. 4, fig. 5), consisting of a white chin beard sharply contrasted with dark whiskers and head, is less common. Sometimes the white involves the moustache. It is then exactly the same as the white area in the African monkey *Cercopithecus brazzae* (pl. 4, fig. 6). I have seen several examples of this human pattern with white moustache, but have not yet secured a photograph.

The fourth pattern (pl. 4, figs. 7, 8, 9) is merely a dark mark on the cheek margin of a gray beard accompanying a gray or bald head. Insignificant though this marking may seem, it is surprisingly common. On April 21, 1930, I visited the Jewish pushcart market district in New York City, one of the few convenient places where many full beards can now be seen, to look for this mark. I found it in no less than 47 out of 55 men with gray or white beards. The same dark line at the edge of the longer hair on the cheeks is found in many of the monkeys that have a partly bare median facial area. An example is shown in Plate 4, Figure 10, the Himalayan langur (*Pygathrix schistacea*). It may be easily observed in immature Japanese macaques, animals that are often exhibited in zoological gardens.

The gray human temple spot (pl. 5, fig. 1) is a common feature of primate color patterning. It is particularly well developed in the gelada baboon (pl. 5, fig. 2).

As they increase in size the temple spots often extend backward along the sides of the head until they cover the entire area that remains haired in normal baldness. The pattern thus formed—dark cap contrasted with grizzled sides and back of head (pl. 5, figs. 3, 4)—is a common one among non-human primates. It is particularly well developed in the West African gorilla (pl. 5, fig. 5. The specimen represented by this photograph is an unmounted skin with the head not filled out to natural form). Occasionally this pattern may be seen reversed. The grizzling is then confined to the area of the normal bald spot, while the hairs at the sides and back of the head remain dark. When this happens the color scheme of the cacajao monkey (pl. 3, fig. 10) is reproduced.

White locks situated on or near the forehead line (pl. 5, figs. 6, 7) are not uncommon, but on other parts of the head they are rare. They may be present without other signs of the graying process (as in fig. 6) or they may appear as a step in that process (as in fig. 7). In either event they are usually confined to some part of an area where patterning occurs in nonhuman primates (pl. 4, fig. 6, pl. 5, fig. 8¹).

PATTERNING ON OTHER PARTS OF THE HUMAN BODY

The process of turning gray usually begins on the head and extends gradually downward over the body. As it advances it often passes through a stage, particularly well represented in Figure 9 of Plate 5, in which the gray area ends abruptly at the middle of the chest, leaving the hair of the arms and lower part of the body dark. The general lines of a pattern found in an African colobus monkey, *Colobus polycomos*, and in an Asiatic macaque, *Macaca albibarbata* (pl. 5, fig. 10), are then closely followed.

Turning to other parts of the human body we find that the same correspondence with widely distributed primate tendencies holds good.

The pubic region is an area of pattern formation in widely separated nonhuman primates. Young chimpanzees have a white pubic patch contrasted with the black surrounding hair. It disappears by becoming black before the animals reach full maturity. Some species of gibbon have no pubic mark whatever. Others display a black spot

¹ The spider monkey represented in fig. 8 of pl. 5 has a band of white extending along the entire frontal border of the true head-hair. The forehead-hair is also white, but it differs from the head-hair in quality and in direction of growth. Before photographing this skin I darkened the forehead-hair with ink.

that stands out against its pale surroundings. Still another gibbon has the hair of this region so greatly lengthened that, in adult males, it may form a tassel reaching almost to the knees. A South American monkey (*Oreonax hendeei*) has a long yellow hair tuft in the male and two shorter tufts in the female. In both sexes the tufts are rendered very conspicuous by contrast with the dark belly and thighs. By specializing the hair of this region man has, therefore, merely followed one tendency of his tribe.

The last conspicuous hair-pattern feature of man is the tuft in the arm pit. This, perhaps, comes the nearest of all the patterns to being an exclusively human trait; I have not yet seen an exactly similar development in any other primate. But, on gently blowing the hair of the axillary region of a freshly dead African monkey, *Cercopithecus aethiops*, I once found that the hairs growing in the deepest part of the pit tended to separate themselves from the surrounding fur by a slight difference in quality and in the direction of growth. More recently I have been able to see, in several adult chimpanzees,¹ that these animals have a definitely specialized axillary tuft confined to the region of greatest glandular activity. To produce the human condition it would merely be necessary to suppress the long surrounding hair.

SOME OTHER FEATURES OF HUMAN PATTERNING

A few other points about human patterning require brief mention.

(a) The general bareness of the human body.

Why the human body lacks a protecting general coat of fur is a question that has been often asked and variously answered. A final explanation seems to be as remote now as ever; but it is possible to recognize the fact that human bareness is only an exaggeration of a tendency that is found in other primates,² and that it is no more essentially mysterious than the bare face of one tropical American monkey (pl. 2, fig. 5) when compared with the fully haired face of another (pl. 2, fig. 7). In neither instance can it be shown that a special need of the species is served by the bare skin; but in both it is evident that the tendency found throughout the primate group to form patterns by contrasting long-haired areas with short-haired areas has been carried to an extreme.

¹ At the Yale University Anthropoid Experiment Station, Orange Park, Fla., an opportunity for which I have to thank Professor Yerkes and Dr. Tinklepaugh.

² On this subject see Schultz, *Human Biology*, vol. 3, pp. 303-321, September, 1931, and *Sci. Monthly*, vol. 33, pp. 392-393, November, 1931.

The general distribution of longer and shorter hair on the body of gorillas rather closely coincides with the human scheme. By continuing the process along the lines marked out in this great ape a stage would eventually be reached in which the body would become bare while the arms and legs retained traces of their original coat.

(b) The different face pattern of men and women.

The sexual hair pattern on the human face is another subject of age-long speculation. No one has ever been able to show that its presence has aided man's career as a species. Equally impossible would it be to show that the analogous sexual patterns in other primates have given these species any advantage over their relatives that lack them. But it seems clear that in this respect man has developed in the same general way as the white-cheeked gibbon of Siam, the orangs of Borneo and Sumatra, the black howler monkey of South America, and the macaco lemur of Madagascar, all of which have sexes that differ from each other in appearance. That is to say, man and these other primates have followed a tendency that may crop out anywhere in the group of animals to which they all belong.

(c) Racial differences in hair pattern and in general color of the hair.

It is well known that not all races of man are exactly alike in hair pattern. Some have better developed eyebrows, beards, pubic patches, or axillary tufts than others; some appear to be not as subject as others to grayness and baldness. Racial tendencies toward darker or lighter colored hair are also well known. These racial characteristics have never been satisfactorily explained on the basis of the special needs of different peoples. On the other hand, as examples of the slight differences that are everywhere found among races of primates nearly related to each other they are readily understood.

The differences between the two races of orang, for instance, are of this nature. The United States National Museum contains 6 males and 6 females of the Sumatran orang, 6 males and 10 females of the Bornean race, all adult or nearly adult. These two series show the same kind of differences that are shown by races of men. In the first place, the beards of the males are much better developed than those of the females. Then, when the beards of the Sumatrans are compared with those of the Borneans they are at once seen to be larger, so much so that an adult male from either island can usually be recognized at once by this feature alone. Finally there is a general difference in the color of the hair on body and head, this being more tawny in the Sumatran race, more mahogany brown in the Bornean.

These two races of oranges inhabit separate parts of one climatic zone, exactly as Caucasians and Mongolians inhabit opposite ends of another. Therefore the differences in hair growth can be no more attributed to the influence of unlike natural surroundings in the second instance than in the first. But it seems clear that the two races of orang and the two races of men are both in early stages of species differentiation, and that the manner of their differentiating is one that is common to the whole primate group.

(d) Total graying.

Often, though not invariably, the process of turning gray culminates in a stage of complete whiteness. But even when a human being has turned gray over the entire body or even has lost all hair color he has done nothing that is essentially new or peculiar for a primate. Light gray or nearly white species of primates have arisen in both Asia and South America. These animals are not albinistic nor in any way individually abnormal. Their near relatives, living in the same regions, are richly colored; and there is nothing to indicate that either light or dark has any advantage over the other. General graying and whitening in man seems likely to be nothing more than another example of human submission to a rule that some other primates have followed. Therefore the strong tendency present in the "white race" of man for the hair to lose its color at an early age may be part of a racial process of depigmentation that has already almost whitened the skin and that may be destined, in the future, to bring about permanent whitening of the hair as well.

CONCLUSION

For the present I wish to avoid detailed discussion of the published attempts to explain those peculiarities of human hair that have just been passed in review. Most of the authors who have considered the subject have done so from the view-point that these peculiarities must have originated from conditions (pathological or cultural) or needs (physiological or esthetic) that pertain exclusively to man. That this view-point is wrong seems to be sufficiently indicated by the evidence here selected from the large mass that I have assembled. This evidence points to the probability that man has these characteristics because, as a primate, he cannot avoid them. They are common property of the great group of mammals to which he pertains, and neither he nor any other member of this group can wholly escape from the tendencies imposed on all of them by their primate heritage. With regard to no nonhuman primate can it be shown that the possession of any

special assortment of these characteristics makes a species better, more efficient, or more at ease in the world than one that has another assortment. So also with man.

The similarities that I have shown to exist between some hair characteristics of man and those of particular monkeys and apes must not be supposed to indicate any special relationship between man and these other primates. When superficial features of this kind are common to a whole group they will often appear in almost identical form in two animals whose relationship is shown by their anatomical structure to be remote.

EXPLANATION OF PLATES

All figures greatly reduced, not to scale

PLATE 1

Color patterns on the heads of eight species of African guenon (*Cercopithecus*). From Elliot, after Pocock.

PLATE 2

The human head-hair pattern and its characteristics as they occur in other primates.

- FIGS. 1, 2. Young adult Caucasian.
 FIG. 3. Partly bare forehead of a Celebean macaque (*Magus hecki*).
 FIG. 4. Bare forehead of an orang.
 FIG. 5. Bare face of a "cotton head" (*Oedipomidas oedipus*).
 FIG. 6. Beard of an orang.
 FIG. 7. Moustache of a marmoset (*Mystax imperator*).
 FIGS. 8, 8a. Eyebrows of a mangaby (*Cercocebus albigena*).

PLATE 3

Types of human baldness and the corresponding conditions in other primates.

- FIG. 1. Raised human forehead line.
 FIG. 2. A South American monkey (*Pithecia monachus*) with hair pattern corresponding with the raised human forehead line.
 FIG. 3. A South American monkey with color pattern corresponding with the raised human forehead line.
 FIG. 4. The two reentrant forehead wedges in man.
 FIG. 5. The two reentrant forehead wedges in the Celebean crested macaque (*Cynopithecus niger*).
 FIG. 6. Bald spot at middle of crown—human.
 FIG. 7. Bald spot at middle of crown—toque macaque (*Macaca pileata*).
 FIG. 8. Complete, normal, human bald crown area.
 FIGS. 9, 10. Nearly bald crown area in a South American monkey (*Cacajao rubicundus*).

PLATE 4

(a) Human color patterns formed during the process of turning gray and the corresponding patterns in other primates.

FIG. 1. White face contrasted with dark head in man.

FIG. 2. White face contrasted with dark head in an African monkey (*Erythrocebus pyrrhonotus*).

FIG. 3. White face contrasted with dark mouth area and dark crown in man.

FIG. 4. White face contrasted with dark mouth area and dark crown in an African monkey (*Cercopithecus lhoesti*).

FIG. 5. White chin and lower lip contrasted with dark face and head in man.

FIG. 6. White chin and mouth area contrasted with dark face and head in an African monkey (*Cercopithecus brassae*).

FIGS. 7, 8, 9. Dark area at edge of light cheek hair in man.

FIG. 10. Dark area at edge of light cheek hair in an Asiatic monkey (*Pygathrix schistacea*).

(b) Eyebrow patterns, human and simian.

FIGS. 10, 12. Dark eyebrows contrasted with light head hair.

FIG. 11. Dark eyebrows contrasted with hair that has turned white.

FIG. 13. White eyebrows contrasted with black head (white-browed gibbon, *Hylobates hoolok*).

PLATE 5

Human color patterns formed during the process of turning gray and the corresponding patterns in other primates (continued).

FIG. 1. The human gray temple area.

FIG. 2. The gray temple area in the gelada baboon (*Theropithecus gelada*).

FIGS. 3, 4. The human gray temple area extended around the head.

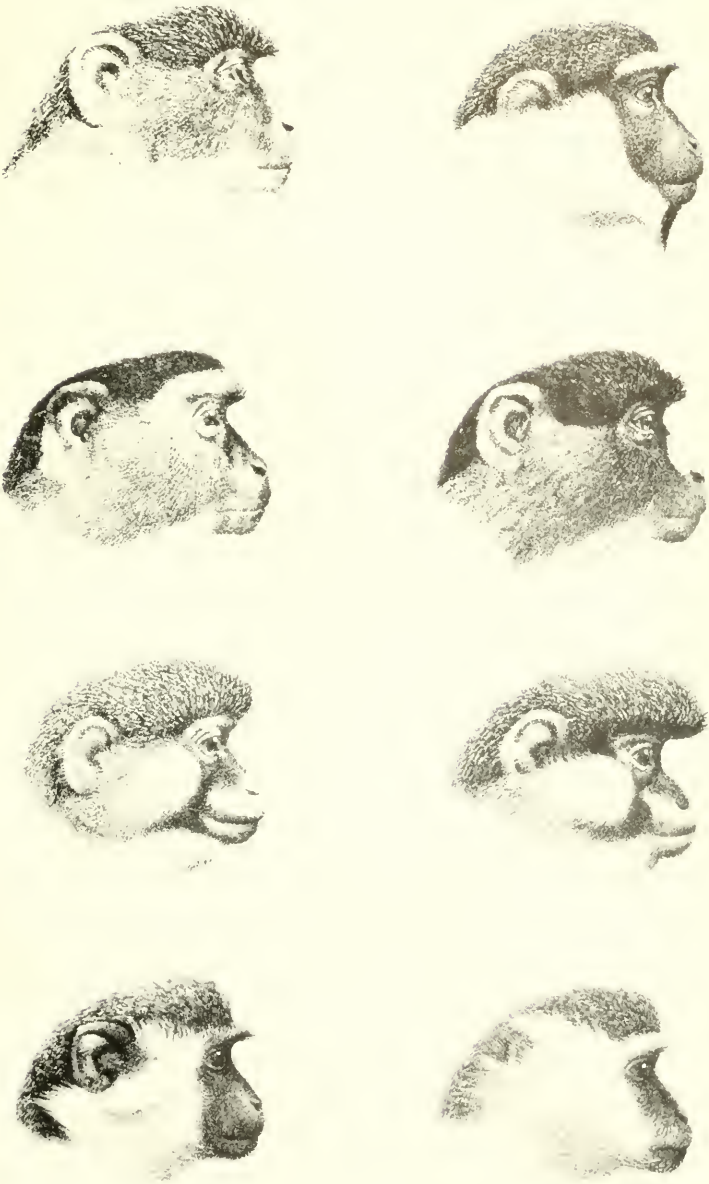
FIG. 5. Color pattern on the head of the East African gorilla.

FIGS. 6, 7. White locks on the human forehead line.

FIG. 8. White stripe along the forehead line in a South American spider monkey (*Ateles hybridus*).

FIG. 9. Gray area extending downward from head to middle of chest in man.

FIG. 10. Gray area extending downward from head to middle of chest in an Asiatic monkey (*Macaca albibarbata*).



Patterning on the heads of eight species of African monkey.
(For explanation see p. 12.)



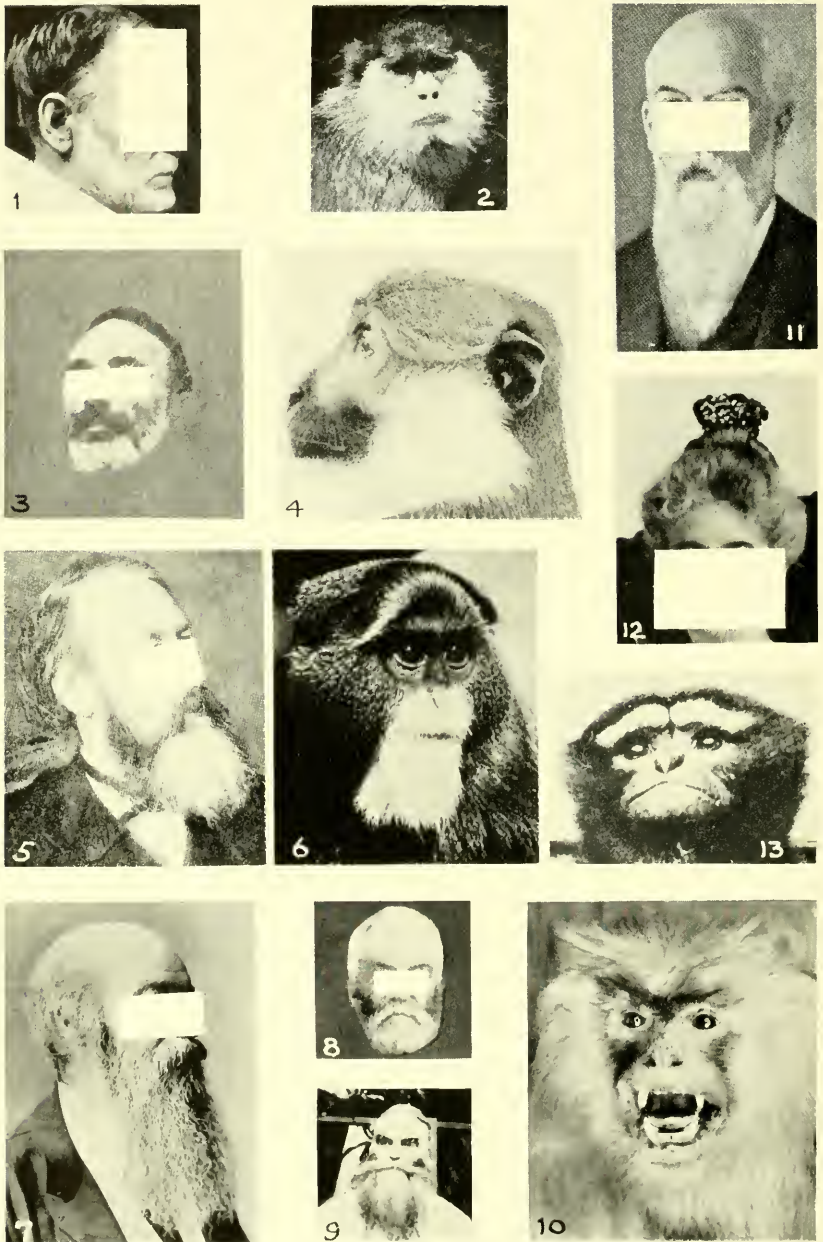
Human face patterns compared with the analogous patterns of five kinds of nonhuman primates.

(For explanation see p. 12.)



Human baldness patterns compared with the analogous patterns of five kinds of nonhuman primates.

(For explanation see p. 12.)



FIGS. 1-10.—Human grayness patterns compared with the analogous patterns of four kinds of nonhuman primates.

FIGS. 10-13.—Eyebrow patterns, human and simian.

(For explanation see p. 13.)



Human grayness patterns compared with analogous patterns of four kinds of nonhuman primates.

(For explanation see p. 13.)