

alike in magnetic and in diamagnetic phenomena the attractive influence of magnetic energy is alone concerned. But in the former case the action of the external is sufficient to overcome the resistance of internal energies. In the latter case it is insufficient, and the traction acts in such a way as to reduce the conflict of forces to the lowest possible level.

IV. BEAUTY IN THE EYES OF AN EVOLUTIONIST.

By F. RAM.

AMONGST the new departures in Philosophy consequent on the discovery, by Mr. Darwin, of the way in which Evolution was effected by means of Natural Selection, it seems inevitable that some change in the older prevalent ideas connected with æsthetics must eventually be included.

Although most persons assume that Beauty, where it exists, is immanent, and is the same *semper et ubique*, difference of opinion on any point being attributed to more or less good taste, such an assumption has not been left undisturbed in the minds of men of a speculative disposition, by whom the question whether Beauty is an absolute quality, or one relative to certain conditions, has been discussed at least since the time when philosophy flourished in Greece. The conclusions arrived at by the best-known writers on the subject are found, however, on examination, to be very conflicting; and I believe that it may safely be said that no satisfactory result has been arrived at by them. One prominent theory is that Beauty resides in "fitness,"—that is, the fitness of the admired object to its place in Nature. This theory, taken as a universal truth, appears to me to be quite untenable, for it implies that we can see no beauty in any object until we have acquired so much knowledge respecting it, and its surroundings, that its fitness is evident to our understanding; which presupposes either an altogether incredible amount of knowledge and capacity of

discernment in the mind of the admiring spectator, or else that he is indifferent to the appearance of most of the objects that present themselves to his sight. Nevertheless I think that it may be shown, to all those who believe in Evolution and in Sexual Selection, that the "fitness" theory is true as regards all those beauties which in either sex most impress the minds of the other sex, such beauties being the outward visible signs of certain qualities of body and mind which make an individual to be one of the fittest to survive in its environment.

From the Darwinian theory, that the struggle for existence results in the survival of the "fittest," it appears to follow also that the number of descendants springing from those who, through their superior fitness, survive, must be greater than the number of those deriving descent from the less fit, and also—and this is the fact upon which, I think, that a sound theory may be built—that wherever Sexual Selection prevails (that is to say, wherever either sex can exercise choice in mating) those whose æsthetic taste delights most in the outward indications of the possession, by the other sex, of qualities which go to make up the "fittest," will have more descendants than those whose fancy is better pleased with indications of the possession of qualities which make a person *less* fit. And thus, since the taste will in either case be inherited, there will be a general tendency, generation after generation, to bring the æsthetic taste of a community into strict harmony with the characters of body and mind most proper to the environment.

The environment to which any type of beauty is thus correlative will not of *necessity* be that in which a race is living. It must be that in which its ancestry lived in the past time, during which the taste was being formed; but there will not be this discordance where the whole community has lived in the same environment for many generations. In other circumstances, such as the change of environment caused by permanent migrations, a corresponding change of taste must be in process.

It is well known that the different races of mankind do not agree in their ideas of Beauty. This fact is readily explicable on the supposition that the various environments are the foundations on which the various tastes are built. For those who love to see in the opposite sex those outward indications of the possession of characters which have little value in the struggle for existence, and *mate accordingly*, will have *fewer* descendants than those who fall in love with the visible signs of the possession of such qualities as are pre-eminently useful in the environment.

That this theory must be true as regards every important point can hardly, I think, be doubted by anyone who believes in Evolution by Natural and Sexual Selection. For, supposing that there were any such thing existing as perfect unconditioned self-beauty, the human mind would surely be unable to detect it, unless such beauty is in correlation to the human qualities adapted to the surroundings. Let us take bodily proportion as an illustration of this fact. Say that in man the proportion of stature to chest measurement should be as 7 to 4, and that an artist with a perfect eye for beauty would admire these and dislike other proportions. If they are not also the proportions most likely to lead to success in the struggle for existence, it follows that those individuals who admire the proportions that are so, and *mate accordingly*, will leave more descendants, *inheriting their taste*, than those who have a better artistic eye, and mate accordingly. In the end these latter strains with the correct taste will dwindle in number, generation after generation, down to extinction; for they will not be able to contend with those who have the taste which is bad in an æsthetic point of view, but good in the purely material one.

I believe therefore that—at least as regards all those principal points of beauty in a human being which most attract the attention of the opposite sex, and the charms of which most engage the pen and pencil of artist and poet—a general *Law of Beauty* may be stated thus:—

The visible signs of the possession of those qualities of body and mind which have tended in the environment of a race to the production of the largest number of descendants constitute Beauty among that race.

So that in an unaltered environment it might safely be affirmed of one hundred persons, of whom it could be foretold that they would have one million descendants after a given lapse of time, that they have a higher average of beauty (in the eyes of the same race) than one hundred other persons who would have one thousand descendants only within the same time; and that the latter are more beautiful than those from whom eventually few or none will derive descent. This law is limited to the beauty of humanity, as perceived by each race, and to the beauty (in the eye of its own species or variety) of such animals as have had Sexual Selection working amongst them.

If there had never been any Sexual Selection, but men and women had always been joined together on some other system,—say, in order of birth,—the theory would have had

no foundation whatever. And indeed in that case there would have been no Beauty,—that is to say, none of those aspects which now in either sex principally attract and delight the eye of the other sex would have been gazed upon with any special admiration.

It must be remembered that man is *practically* a machine, and that his beautiful body is adapted to a work-a-day world. To hear most people talk on the subject, one might suppose that the “human face divine” was made up of “flesh” placed on the bones for the purpose of making up a countenance, whereas it is really composed of muscles which are required to move the jaws. Again, as regards the proportionate dimensions of the body: man’s heart and lungs fill his chest, and they and his whole respiratory system must be adapted to the composition of the air which he breathes. In the atmosphere the oxygen is in the proportion of 1 to 4 of its ally, the nitrogen. But if the mixture of these two gases had been different; had the oxygen, say, been equal in quantity to the nitrogen, or had been 1 to 40, or 400, the measurements of man’s body must have been altogether different from what they now are. And therefore those who, when gazing on a fine statue, can believe in an intrinsic self-beauty, seem to be driven to a conclusion which jars very much with the widened conceptions of the universe existing at the present day, namely, that the ingredients of the atmosphere were mixed in proportions specially adapted to produce beautifully shaped men and women. And not only so; but even the very mass of the earth itself must also have been regulated on the same grounds; for the density of the air on the earth’s surface, and the quantity of oxygen inhaled at each inspiration, must depend on the weight of our planet. So that if Tellus had only been, say, of the same mass as the moon, man’s shape must have been quite different from that which we now consider beautiful.

If we now direct out attention to other aspects of the human body, the theory advocated will be seen to be supported by the evidence to be drawn therefrom. The *vera causa* of deep æsthetic emotion is seen as clearly in *Complexion* as in anything. For it will be allowed that a good colour is a sign of health. Now health being an advantage in the struggle for existence, it follows that the possession of it tends, on the one hand, to increase the number of one’s descendants, and, on the other, admiration of a visible sign of its existence in the other sex tends to give a numerous progeny to those who have this inheritable taste in force. The “association school” of writers on the subject of Beauty

would doubtless say that a rosy complexion charms, because we learn to associate health with it in our minds. But I think it vastly more probable that the love of a fine complexion is purely *instinctive*, and that we should equally think it beautiful if we had been taught that it was a sign, not of good, but of ill health. In fact, those who in past generations had a good eye for the right tint have left many descendants (inheriting the taste), and those who were indifferent to it fewer, if any.

The physiological reason why the beautiful rosy or pink complexion is admired is this:—The red corpuscles of the arterial blood give the colour; and it is they which carry the indispensable oxygen through the arteries to the parts of the body requiring it, so that the good complexion witnesses to the goodness of the respiratory system. If the blood were colourless, and the cheeks were reddened by an effusion of a vermilion liquor, gushing from special glands, and serving no other purpose than that of embellishing the countenance, the argument would of course fall to the ground. But inasmuch as the colour is evidence that the system is well furnished with that gas upon the ceaseless supply of which all bodily and mental activity—life itself—immediately depends from moment to moment, it appears clear that the physical fact creates the beauty.

It is to be noted that Natural Selection has given to woman an uncontrollable knack of showing her blood as much as possible when a *favoured* admirer stands before her, her blushes saying—“See, here is oxygen-laden blood. Do you see these red corpuscles? What a respiratory system your sons by me would inherit!” It is not without significance, too, that this blushing, though involuntary, is (as the Commander of the Faithful is told by his wife in one of the “Arabian Nights Tales”) a proof that she loves her male admirer. The red corpuscles are made to attract his attention in proportion to the degree in which the match is *instinctively* seen by her to be desirable, with reference to the viability of her offspring. The blush is the more advantageous from the fact that moonlight is proper to courting—a light in which the cheeks look more pallid than in the light of day.

The much-admired “vermeil-tinctured lip” and “bright eyes” tell of the same desirable physical quality, namely a good circulation of healthy blood.

If space permitted it might be shown that there is a general correlation between the attractions of either sex, and such good physical qualities as would tend, through the

æsthetic taste leading to the increased chances of viability in the offspring of persons who have such taste, to the multiplication of descendants. But an allusion only to some of them will perhaps be sufficient to maintain our case. Thus there is evidently a connection between the beauty of an unbroken row of sound white teeth and the use for which they have been required. If our race had always fed themselves by a process of suction instead of by biting there would have been no beauty seen by us in the finest row of teeth—an altogether different feature being the delight of our eyes.

The beauty of a good head of *hair* is connected with the protection it affords. It is true that the head may be covered by some artificial head-dress; but an irremovable covering would be a greater security against strokes of the sun, which may be suddenly fatal without any preliminary warning discomfort, as well as against the atmospheric changes so apt to produce colds. The human back has indeed been deprived of its hirsute covering, but the dangers arising from this loss may have been of less consideration than the advantages thereby gained. The loss was really a gain, as the artificial protection would more than make good the natural one, since it could be more readily cleared of *Epizoa*, and could be shifted when too heavy for the season or sodden with wet.

(To be continued.)

V. SILKS AND SILKWORMS.*

By J. W. SLATER.

FOR ages the silk of commerce has been furnished by one silkworm, the larva of *Bombyx mori*. Such is at least the general opinion, though in strictness it must be admitted that five other species of *Bombyx*, all, like the first mentioned, feeding upon the mulberry, exist in a state

* Handbook of the Collection illustrative of the Wild Silks of India in the Indian Section of the South Kensington Museum. By THOMAS WARDLE. London: Her Majesty's Stationery Office.

II. BEAUTY IN THE EYES OF AN EVOLUTIONIST.

By F. RAM.

(Concluded from page 81.)

BARRY, in one of his Royal Academy Lectures, observes that we should not add to woman's beauty by any increase in the number of her mammalian protuberances. But we may safely assert that, if any increase in the number of these protuberances had led to her raising offspring superior in number or viability to those raised under the present arrangement, men would see beauty in this numerical increase; artists would have bestowed them on the Goddess of Beauty, and mammæ in duplicate only would have been repulsive.

One of the many points in which the taste of other races differs from our own is the fondness for extreme obesity which resides in the minds of some savages. Can it be doubted that *Famine*—which has been the chief factor in the production of the bodies and minds of all living creatures—has also been the originator of this strange taste? For the man who desired a fat wife would have been always more likely to have his babes sustained through a time of straitness than one who was contented with a woman who had laid in a smaller store of nutriment on her own person. In a minor degree this fact is seen amongst ourselves at the present day, the leaner females—in the classes in which there is much choice of wives—being more usually left to become old maids. This fact bears witness to the existence of famines in former days. But such a taste could not be expected to be strong in a race whose ancestors secured a scanty living by means of much activity in hunting. Such people would rather pick out their mates with reference to the agility which they saw displayed at some dance or corroboree, and would look rather for grace, or beauty in movement: on which account their descendants perhaps are pleased at the sight of the agility displayed by ballet-girls.

Some parts of the human body are beautiful chiefly by smallness, of which we may instance the shell of the *ear*. This, it is generally now allowed, is a useless rudimentary excrescence, and its maintenance has probably been a mere waste of material for tens of thousands of generations. As the ear-shell must, as is shown by its existence, have been

of use to some far-off ancestors, another reason may have existed for its being subsequently discarded. The powers of an animal's mind depend greatly upon the degree in which it can fix its attention upon one subject at a time. The value of performing monkeys depends very much upon the degree in which this faculty is possessed. And indeed a prolonged fixity of attention upon one point is essential to all great mental results. Hence the fixity of gaze of the genius, as compared with "the eyes of the fool, which run to and fro in the earth." Therefore we may suppose that the distracting effect of a sound-collector might have been injurious to man's advance in intellect.

Bernstein, in his "Five Senses of Man," asserts, with reference to the angle (40°) which would be best adapted to the purpose of collecting sound into the human auditorium, that some persons might object to such an angle "on æsthetic grounds." But it is certain that if such an angle, or any enlargement whatever of the human ear, had been advantageous in the struggle for existence in the past, such an altered structure would have been highly approved "on æsthetic grounds." For, if a maximum ability of collecting sounds had been most advantageous, those who were contented with the appearance of a structure deficient in this way would have had fewer descendants (to carry on their erroneous taste) than those who saw beauty in the greatest spread of cartilage that could be beneficial.

So difficult is it to "find the mind's construction in the face" that little *pro* or *con* my theory can be brought from the expressions of the human countenance. But it may be said that the soft smile which gives an additional charm to a maiden's face, by promising placidity of temper, also promises a man that his infant will not be injured during the period of lactation by the acidity of the mother's milk being conveyed, as is often the case, to the mammalian food.

The sentiment expressed in the French proverb "Il faut souffrir pour être belle," though at first sight apparently adverse to the theory maintained above, in reality supports it. Past suffering may give an additional charm to a beautiful face, because it is evidence of strong vitality, the sufferer being seen to have passed through adversity *without dying under it*. Strong vitality promises many descendants; therefore those who admire any possible visible indication of such trait will have always had a correspondingly good chance of having such æsthetic taste inherited.

I will not dwell, in further detail, upon other special points of beauty which—being correlative to excellences of

body or mind—ensured a numerous viable offspring to those whose mating was regulated with reference thereto.

Though confident that the theory must be correct with reference to those beauties which produce the largest amount of emotion in the susceptible bosom of either sex, I am not prepared to say that the rule is universally applicable. Should the size, shape, or colour of any part of the body be of no importance, in such case, and in such case only, we may perhaps approve of the *average* of what we are accustomed to see. And thus we may dislike a very big or a very small nose, though either may perform its assigned office well enough. Again, some taste relating to a matter of no importance, if there be any such, may be regulated by sentiment. Thus, should an oppressed nation be ground down by a powerful foe notable for bushy beards, patriotic hatred might make bushy beards an abomination; and in the oppressed community a bare chin might be etiquette for ages after the oppressor's yoke had been cast off.

It may strike some minds that, if a theory connecting beauty with the environments is correct, there would be a uniformity of taste in any community, and that there ought also to exist something like a general prevalence of the beauty fitted to the locality. To which possible objection I reply that, in a race dwelling for a great number of generations in one environment, nearly all the members of the community would be very beautiful in one another's eyes. And I have no doubt that wild animals, amongst whom Sexual Selection prevails, are much to be envied in this respect. For as Natural and Sexual Selection eliminate the members of the species which are ugly in the eyes of the same, all the survivors are adorned with qualities coinciding as nearly as possible with the prevalent æsthetic taste. At the same time any animal which man has domesticated must be hideous in the eyes (if still agreeable to the nose) of its wild relatives who have inherited likings which do not accord with the changed appearance given by man to the domestic creature for his own purposes.

The inhabitants of any country which, like those of England, have sprung from ancestors of various environments, cannot of course often be gratified by the sight of what they consider ideal beauty. Change of environment, whether it arise from the migration of a people, or from such fluctuations in the surroundings as spring up now-a-days in every civilised nation, is inimical to the gratification of inherited æsthetic taste. Therefore there cannot be any type of beauty generally accepted in a country originally

peopled as the British Isles have been, even were there no variety of environment therein.

Supposing the environment, by means of Natural and Sexual Selection, makes the beauty accepted by the inhabitants of the locality, how are we to account for the fact that savage nations practise artificial deformities on its members? Only by assuming that the so-called "deformity" is actually beneficial to the race. It does not follow that because we have not yet found out how a flattened forehead is a gain in the struggle for existence, that therefore it is not so. I venture to say that it cannot be materially injurious, and it is certainly most probable that it is in some obscure way a decided advantage; otherwise the taste for it would be weeded out by those having most pleasure in the sight of it lessening thereby the number of their descendants. In such cases, and indeed wherever Sexual Selection acts, we see Natural Selection choosing, as fittest to survive in the locality, the strains which are the possessors of certain brain-cells containing an æsthetic taste.

Amongst artificial deformities must be included the constriction of the waist by English ladies. This practice, though generally now deprecated, will, I believe, come to be understood in time. Women who do not perform more foot-pounds work than is accomplished in a promenade have a good deal more lung-power than they require, and it is a question whether a reduction of the oxygenation done in the body does not lead to a diminution in the amount of food which the digestive apparatus is called upon to deal with. To talk of "interferences with Nature" is not to the purpose; for, as with all other animals, the organs with which mankind are at birth endowed have no reference whatever to their own future requirements, but are fixed solely by the needs of their forefathers, from whom they inherit them.

But whether a tightened cincture is good or evil, the object in the mind of the lady who thus operates on her own waist is to appear "genteel." This natural inherited instinct—the desire we have to appear to belong to the upper ranks of society—springs from the fact that in former times the higher were the *safer* classes, the lower being more likely to perish from want; on which account the proud and ambitious, who strove to raise their social position, left more children (inheriting their traits of character) than those who were content with their natively humble grade. One aim of the slight waist is therefore parallel to that of wearing fine clothes, or any mimicry of a higher rank,

namely, the facilitation of marriage relations with an order having the means to bring up a larger percentage of their progeny. Besides which, the higher classes are more tenacious of life than the lower, because they are sprung from progenitors the length of whose lives enabled them to hoard for their issue that wealth on which alone social position depends. Therefore to marry into a class above one's own is usually equivalent to having children of greater natural vitality—entailing a correspondingly abundant transmission of the ambition to future generations.

The theory of Beauty dealt with in this article relates to the beauty of an animal in the eyes of its own species, and therefore it is unnecessary to dwell here upon that which man sees in brutes, which, if comparable to a human type,—as, for instance, in their optical organs or in their hair,—may be pleasing or otherwise. If not so comparable, they are almost outside æsthetics; for an elephant, or hedgehog, can hardly by their appearance cause more æsthetic emotion in us than a locomotive or a lump of coal.

Of landscape, and the charms which exterior Nature at large has for us, it may be affirmed that our taste must have been formed with reference to the environment, those best pleased with their surroundings reaping such physical advantage therefrom in health, &c., that they were the most viable and prolific in the locality, and so left more descendants, inheriting their taste. If vegetation had been universally red instead of green, and the sky brown instead of blue, those colours would have been thought most beautiful for earth and sky,—not indeed by us, but by those who, under those altered circumstances, would have been selected to occupy our places. If people now living under clouded skies prefer the blue welkin, it is because their race has inherited a love for the same from forefathers who long dwelt under a cerulean vault. The leaden canopy of England will be charming to those living under it when a sufficient number of generations have passed for Natural Selection to have acted on. The love of mountain scenery which some men possess records the fact that their ancestors were benefited by such a taste, which led them to dwell in localities least accessible to the foe.

The proper subjects for artistic representation are those which are pleasing to our sight by reason of their relation to the *past* environment of our race. We like to see on canvas simple peasants in homely attire, rather than fashionable people dressed in the latest mode. Delineations of steamships, railway trains, and other appurtenances of civilisation, seem out of place on the walls of an academy.

They do not awake, in persons who are æsthetically emotional, the sentiment which springs from the sight of paintings of queer small ships, or boats with quaint old rigging, old tumble-down cottages, or roughly-built carts. The latter sort of things composed our forefathers' surroundings, and not steamships and locomotives. If the latter had borne them over land and sea for a thousand generations, they too would by this time have afforded to the artist fit subjects for his pencil.

But for the extent to which this article has run, some evidence might be added to show that our love or hatred of such sounds and odours as mankind have come into contact with abundantly, have been acquired by a process analogous to that by which man's taste for visual beauty was bestowed upon him.

I have only to add that, although physical beauty only has been referred to in this article, it is clear to my mind that the mode of the origin of man's principal ideas of *moral* beauty must necessarily be closely analogous to that of his main ideas of the physical.

III. MESMERISM.

By N. GORDON MUNRO.

DOCTOR.—“ You see her eyes are open.”

GENTLEMAN.—“ Aye, but their sense is shut.”

THERE seems to be in this age of scepticism and doubt a prevailing tendency among men of Science to entertain feelings of contempt towards anything which is, even in the slightest degree, invested with the character of the supernatural. Whatever has a tendency to disturb preconceived opinions, or to pass beyond the limits of our present intelligence, is, without inquiry, condemned as an absurd and dangerous innovation. Now this antagonism and habitual resistance to whatever seems new, instead of being productive of good, is nothing more or less than the outcome of prejudice and self-interest, and as such merely serves to interpose obstacles to the advance of Science.

Healthy criticism can by no means be objected to ; on the contrary, criticism, in the proper sense of the word, is the auxiliary of truth, and the means by which the true is differentiated from the false. But it surely cannot be called *healthy* criticism where the critic takes his stand under the banner of the *nil admirari*, and launches forth his thunder-