XIII. *On the Apparent Direction of Eyes in a Portrait.* By WILLIAM HYDE WOLLASTON, *M. D. F. R. S. and V. P.*

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IT may seem, at first view, that portrait painting is not altogether a fit subject to be brought before the Royal Society, since the delicate touches by which the skill and feeling of an accomplished artist convey an expression of sense, and grace, and sensibility to the finished representation of the human form, cannot admit of such strict analysis as the ordinary subjects of our inquiry.

Nevertheless, since the rules of perspective, which are strictly mathematical, are perfectly within our province, it may be presumed that a question, in which some principles of that science are involved, may be considered a legitimate subject of communication; that effects not anticipated on any received principles must deserve attention; and that the explanation of them will be found to have some pretensions to utility.

When we consider the precision, with which we commonly judge whether the eyes of another person are fixed upon ourselves, and the immediateness of our perception that even a momentary glance is turned upon us, it is very surprising that the grounds of so accurate a judgement are not distinctly known, and that most persons, in attempting to explain the subject, would overlook some of the circumstances by which, it will appear, they are generally guided.

Though it may not be possible to demonstrate, by any decisive experiment on the eyes of living persons, what those circumstances are, still we may find convincing arguments to prove their influence, if it can be shown in the case of portraits, that the same ready decision we pronounce on the direction of the eyes is founded, in great measure, on the view of parts which, as far as I can learn, have not been considered as assisting our judgement.

Previous to a full examination of this question, one might imagine that the circular form of the iris would be a sufficient criterion of the direction in which an eye is looking, since, when the living eye is pointed to us, this part is always circular, but cannot appear strictly so, when turned in such a manner that we view it with any degree of obliquity. But, upon farther consideration, it is evident that we cannot judge of exact circularity with sufficient precision for this purpose, even when the whole circle is fully seen, and in many cases we see too small a portion of the circumference of the iris to distinguish whether it is circular or elliptic.

Moreover, in a portrait, although the iris be drawn most truly circular, and consequently will appear so when we have a direct view of it, still, in all oblique positions, it must be seen as an ellipse. And yet the eyes, as is well known, apparently continue to look at the spectator, even when he moves to view them very obliquely, and sees them of a form most decidedly elliptic.

The reason why the eyes of a portrait seem to follow us will be hereafter considered, but cannot be rightly explained until the circumstances, on which apparent direction in the front view depends, are fully understood.

If we examine with attention the eyes of a person opposite to us, looking horizontally within about twenty degrees on either side of us, we find that the most perceptible variation in the appearance of his eyes, in consequence of their lateral motion, is an increase and decrease of the white parts at the angles of each eye, dependent on their being turned to or from the nose.

In the central position of an eye, the two portions of white are nearly equal. By this equality, we are able to decide that a person is looking neither to his right nor to his left, but straight forward in the direction of his nose, as index of the general position of his face.

If, on the contrary, he turn his eyes to one side, we are immediately made sensible of the change by a diminution of the white of the eye on that side to which they turn, and by this test alone we are able to estimate in what degree they deviate in *direction from the face to which they belong*.

But *their direction with reference to ourselves* is perfectly distinct from the former; and in judging of this it seems probable that, even in viewing real eyes, we are not guided by the eyes alone, but are unconsciously aided by the concurrent position of the entire face; for in a portrait, the effect of this further condition admits of being proved by a distinct and decisive experiment.

If a pair of eyes be drawn with correctness, looking at the spectator, at such moderate deviation from the general position of the face as is usual in the best portraits, unless some touch be added to suggest the turn of face, the direction of the eyes seems vague, and so undetermined, that their direction will not appear the same to all persons; and to the same

person they may be made appear directed either to him or from him by the addition of other features strongly marking that essential circumstance, the *position of the face.*

In the drawings which I am enabled to exhibit to the Society, I am indebted for assistance to the well known skill and obliging kindness of Sir THOMAS LAWRENCE, President of the Royal Academy, by whom the pair of eyes represented in the first plate were originally drawn from the life, intently looking at him. To these a turn of face has since been added according to the original design, so that the eyes, with this accompaniment, Fig. 1, appear decidedly looking at the spectator.

In Fig. 2. a set of features oppositely turned are so applied to the same eyes, that they look considerably to the right of the person viewing them.*

In the former of these, the position of the face being at a certain angle to our left, the eyes, which are turned at an equal angle from that position, seem pointed to ourselves. In the latter, the deviation of the face from us being toward the same side as the turn of the eyes, gives additional obliquity to their apparent direction, and carries them far to the right of us, proving the influence of the stronger features, even in opposition to that of the minuter parts of the eyes themselves, which are not in correct drawing for this position.

With regard to the apparent position *of the face*, it is clear that, in forming our judgement, we must be influenced princi-

* The effect of this change is so sudden, and so contrary to expectation, that, at first sight, many persons seem scarcely to credit the evidence of their senses, in supposed opposition to their former experience, and are inclined to imagine some present *deception* in the very phenomena best adapted to *undeceive* them as to the cause of the impression they receive.

pally by the nose and other parts of it that are most prominent, because these, in nature, are subject to the greatest changes of perspective form by any alteration of position; and we scarcely notice those smaller variations of figure, to which even parts least prominent are liable when seen very obliquely.

It must be obvious to the most superficial observer, that the same perspective form which correctly represents a certain pair of eyes in one position of the face, cannot be an exact representation of the *same* eyes in another; but in cases of such slight obliquity as is usually given to the eyes in a portrait that is intended to look at the spectator, the variation of the form of the lids from obliquity is less than the difference observable in the eyes of different persons. Hence it is that a pair of eyes drawn looking at us, will best admit of being warped from their intended direction by application of a new position of the other features of the face.

The converse of this experiment may also be made with success within the same limited extent. Eyes drawn originally looking a little to one side of us, may be made to look at us by applying other features in a suitable position. But although a change of twenty or perhaps thirty degrees may be effected, it is not to be supposed that a turn of ninety degrees can be produced. It would be absurd to imagine that an eye drawn in profile could be made to look full upon us, or that an eye looking nearly at us could be made to appear in profile.

If an attempt be made to carry the experiment beyond reasonable limits, so that the perspective form of the eyes is

glaringly ill-suited to that of the rest of the face, the effect is impaired by such obvious discordance, but is not altogether lost; for though some persons much accustomed to drawing the human eye, who are in the habit of attending minutely to the shape of the lids, may not feel the full effect perceived by others, still the change of direction that *is* admitted by the generality of those who have nothing to warp their judgement, shows how little influence the eyelids really have in giving apparent direction, in comparison with the more prominent features.

In order to show how small an addition is sufficient to produce the effect, in Plate X. are four copies of another representation of the same pair of eyes made exactly alike by the admirably ingenious process of Mr. PERKINS. A strong plate of steel on which they were first engraved, having been subsequently hardened, gave an elevated impression of them to a soft steel roller, passed with great force repeatedly over the surface of the plate. The roller having next been hardened in its turn, became the tool for transferring four impressions to the same plate of copper, with the most unquestionable identity of representation in the four copies to each other. Nevertheless in two of these their apparent direction will be seen to differ by the mere position of the noses, and in the others a corresponding difference is effected solely by means of the upper half of the face.

For the sake of greater perspicuity, we have hitherto considered merely the cases of *lateral* turn of the eyes and face, at small angles of deviation to the right or left, by the balance of which, if in opposite directions, the eyes appear to look at us; or, if the inclination of both be toward the same side of

us, then the eyes seem turned away from us by the sum of those angles.

The same principles apply also to instances of moderate inclination of the face upwards or downwards. For when the face is pointed downwards, the eyes that look at us must be turned upwards from the position of the face to which they belong. And, if to eyes so drawn an upward cast of features be substituted for the former, the eyes seem immediately to look above us.

When the turn of a pair of eyes partakes of both inclinations, so as to be in a direction laterally upwards, the alteration produced by changing the position of the face, affords the most striking exemplification of the force of this principle, as may be seen in Plate XI, and its companion.

But the effect thus producible is by no means limited to the mere extent of deviation, as a total difference of character may be given to the same eyes by due representation of the other features. A lost look of devout abstraction in an uplifted countenance may be exchanged for an appearance of inquisitive archness, in the leer of a younger face, turned downwards and obliquely toward the opposite side. The under eyelid, which in the former position conceals a portion of the ball of the eye, from an effect apparently of mere perspective, will in the latter seem raised with effort, and thus give the appearance of a smile to the same eyes, if supported by corresponding expression of the rest of the countenance. But it is needless to pursue the various modifications of which this experiment is obviously susceptible. The instances already given are sufficient to show that the apparent direction of the eyes to or from the spectator depends upon the

balance of two circumstances combined in the same representation, namely,

1st. The general position of the face presented to the spectator; and,

2dly. The turn of the eyes from that position.

With this previous knowledge of the influence which the general perspective of the face in a portrait, has upon the apparent direction of the eyes, we shall be prepared to examine why, if they look at the spectator when he stands in front of the picture, they follow, and appear to look at him, in every other direction.

If we consider the effect produced by our change of position with reference to any other perspective drawing, we find a similar permanence of apparent position of the objects represented with respect to ourselves, and corresponding change of direction with reference to the plane of representation, or to the room in which it hangs; and we shall be able, in this case, distinctly to trace its origin in the simplest principles of perspective drawing.

When two objects are seen on the ground at different distances from us in the same direction, one will appear and must be represented exactly above the other. The line joining them is an upright line on the plane of the picture, and represents a vertical plane passing through the eye and these objects. When objects that are at different elevations are said to be in a line with us, the strict meaning is, that they are so placed that a vertical plane from the eye would pass

through them. Now, since the upright line (drawn or supposed to be drawn on the plane of the picture and representing a vertical plane) will be seen upright, however far we move to one side, and will continue to represent a vertical plane, it follows that the same set of objects, even in the most oblique direction in which the representation can be viewed, are still in the same vertical plane, and consequently will seem still to be in a line with us, exactly as in the front view: seeming as we move, to turn round with us, from their first direction, toward any oblique position that we may choose to assume.

In portraits, the phenomena of direction with reference to the spectator, and corresponding change of apparent position in space when he moves to either side, depend precisely on the same principles. A nose drawn directly in front with its central line upright, continues directed to the spectator, though viewed obliquely. Or, if the right side of the nose is represented, it must appear directed to the right of the spectator in all situations; and eyes that turn in a due degree from that direction toward the spectator, so as to look at him when viewed in front, will continue to do so when viewed obliquely.

As an illustration of the permanent directions of the nose and eyes in a portrait, if a compass be represented, Plate XII. in front of the picture, in a square box, so placed that the sides appear in the same direction as the nose, the needle being set parallel to that of the eyes, will represent, in all positions from which it can be viewed, a line pointing in their apparent direction, and by its permanently vertical position will justly exhibit the same appearance which eyes do, of

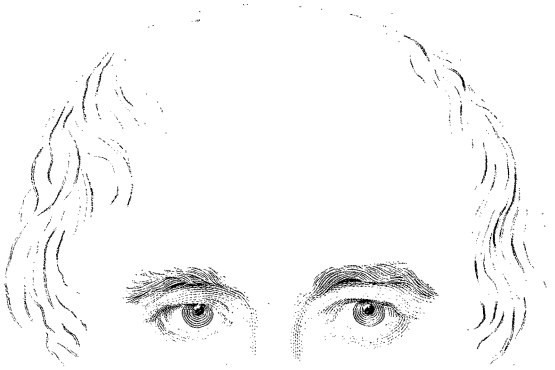
following the spectator to either side. In the same manner, if the eyes be turned toward one side, a corresponding needle would duly appear to retain its position toward the same side of the spectator, just as the box does in the former instance.

In any extended drawing the lines of direction admit of being clearly marked in the relative position of objects at different distances; but in portraits the circumstances are less distinct, for want of some visible mark indicating the direction of the eyes. But, if any object be represented in front of the picture, so that the center of one of the eyes may appear to be exactly over it, we have then a marked line of direction, which, by its permanently vertical position, renders the relation of the appearances in a portrait, to the corresponding phenomena in extended views, complete.

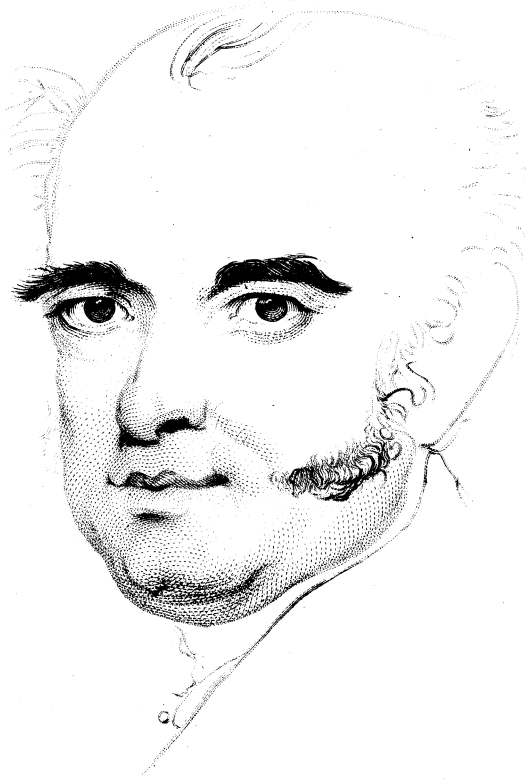
Fig. 2.

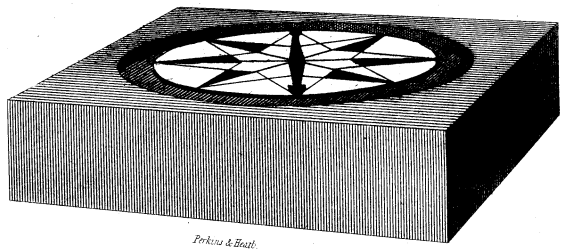
Part of Plate IX.

Fig. 1.



Phil. Trans. MDCCCXXIV, *Plate XI. P. 256*





Perkins & Heath.