PSYCHOLOGY

First Vision

Psychologist Has Made a Study of How the World Looks to Those Who Have Always Been Blind

By MARJORIE VAN DE WATER

SUPPOSE you had been blind from birth. Suppose that the rich variety of colors that you see in nature, in dress, and in familiar household objects were merely names to you; that all forms were strange, and movements novel to your sight.

Can you picture to yourself just how they would look to you when your sight was restored? Would you admire the sights you now find beautiful? Would you be able to distinguish a pencil from a fork? Would you be attracted toward a red hat or repelled by a red apple?

Some few people have had just this strange experience. Born with cataracts on their eyes that prevented all vision, and even in some cases excluded all light, they were operated on when they were grown up and as adults had the confusing experience that confronts every newborn baby—looking on the world for the first time.

Now a psychologist, Dr. Wayne Dennis of the University of Virginia, struck by the dramatic quality of their experiences and with the value they would have in indicating just what aspects of our vision are "natural" or unlearned and what are acquired through practice in seeing, has searched through dusty books on medicine and accounts in journals old and new for the stories of such cases. He has summarized what he found in a report to the *Journal of Social Psychology*.

Learning to Look

Did it ever occur to you that your ability to train your eyes on the object that you wish to see is something that you have learned as a result of experience? Observation of these persons with newly acquired vision indicates that it is not an ability that just "comes naturally" along with the blessing of sight. Those individuals whose eyes were thinly obscured by the cataracts so that they were able to tell light from darkness had learned in their handicapped state to turn their heads toward the source of light. These persons were able without difficulty to turn their eyes toward any object they wished to observe. But others who had lived in total darkness had to learn how. They were puzzled as you might be in trying to watch a moving object reflected at a peculiar angle in a mirror. They had to turn their heads in first one direction and then another until the object was directly seen.

Distance is another baffling matter to those with new vision. Objects at a considerable distance are groped for close to the face, reminding the observer of the confident way in which a baby will reach out and try to clasp the shining moon.

A boy given his sight for the first time at the age of 13, thought that all the objects he could see must be brushing against his eyes in the same way that the things he felt must touch his skin. Another patient, a man, went up a flight of stairs two steps at a time without noticing what he was doing; others constantly were inclined to step too high when walking with their eyes open.

World is Bewildering

Perhaps you think that the shape and texture of objects look just about as they feel. That is only so because of your long association of the sight of things with their feel in your hand. Those to whom vision is a new experience look upon a bewildering world of unrecognizable objects. They have no notion of what anything might be. Even the simple form of an orange can not be identified until it can be touched. This is very confusing to the patient, and sometimes depressing or discouraging as well.

The thirteen-year-old boy started out, just as a child would, by asking of each object, "What is it?" He would stare long at it, trying to fix its appearance in his mind so that he should know it when he saw it again. He would thus learn—and forget—what seemed to him to be thousands of objects in a day. One day he discovered that he had forgotten which was the cat and which was the dog. He picked up the cat and held her, recognized her by feeling and then looked at her steadfastly, at last setting her down with, "So, puss, I shall know you another time."

COULD YOU NAME THIS BIRD?

To the person who has never before seen, even the common dog and cat look as strange as this creature does to us. It is a mythical bird described in an old book, "Curious Creatures in Zoology."

Faces are not easily recognized by those with newly acquired vision. It was three days before one patient noticed the nose on her brother's face. Even after months of vision, only the most intimate familiars are known "by sight."

Colors seemed to be immediately distinguished by these persons, and the names for them readily learned. In fact colors, in some cases at least, made more impression on the patients than they would on a person accustomed to vision. One woman wanted to throw away all her dresses because they seemed to her too gaudy.

What the individual with new-found vision considers beautiful or repulsive is sometimes incomprehensible to those who have long seen. And, indeed, there does not seem to be any agree-

ment of tastes among those just given sight.

Some expressed a strong preference for the color yellow. Yet another patient, a man of 30, said that when he first saw the color yellow it made him positively ill. One patient, a boy of 17, said that the human face pleased him more than any other object presented to view. Contrasted with this feeling is that of the woman of 22 who said that human faces were repulsive and that the mouths were like black holes.

Great was the disillusionment and disappointment when it was discovered that the most loved persons were not the most pleasing to the new-found sight. Or when things that had been pleasing to the touch, taste, or hearing, were not found good to look upon.

The woman to whom human faces were repulsive also reported an unhappy experience with her food.

"I could not bring myself to eat anything but milk, mashed potatoes or bread—they looked clean, but toast or meat or eggs looked dirty and disgusting," she said. "I could not eat tomatoes, beets or roast beef, of which I had been very fond—they were so red and hard and the looks of them sickened me."

This tendency of "eating with the eyes" is not one confined to those unaccustomed to sight, one is reminded, however. Flour and bread makers find that their products sell much better when they are bleached to a pleasing white, even though brown is a natural color for flour and brown bread just as nourishing as the snowy white. Perhaps this is because white is associated in the mind with cleanliness and purity, and dark colors with dirt or coarseness.

Time and good flavor have reconciled your eyes to the brown of turkey and gravy and mince or pumpkin pie, but to the newly seeing the color of these treats comes as a distinct shock. One woman also was disgusted when she saw someone drinking port wine. She explained, "It is dark, and looks to me very ugly."

One woman said that the most beautiful thing she looked upon during her first few days of vision was the clear blue sky above. On her first walk out of doors, it was this glorious sight that first attracted her attention.

"It is the prettiest thing I have ever seen yet," she commented. "And equally pretty every time I turn around and look at it."

Physiologists have long known that the image made on your eye by the objects you look at is turned upside down by the process. Yet no one ever sees things that way. Somehow the brain is able to correct the error made by your eyes and you perceive the objects as they really are. not as your eyes pick up the image.

Psychologists are consequently interested in finding out just how the correction is made possible. Do we learn to see things right side up after reaching and otherwise checking our vision against other senses and finding that the floor is really down and the ceiling up?

Apparently not. It seems natural for this correction to be made, for us to see things as they actually are. The cases of late vision did not report being troubled with the nightmare of an upside down universe.

HEAVEN'S BLUE

"It is the prettiest thing I have ever seen yet; and equally pretty every time I turn around and look at it." Thus a woman given her first glimpse of the beauties of the world described the clear blue sky, a sight often taken for granted by those with vision.

Seeing Right Side Up

To prove that the images were actually perceived as right side up, one woman was shown a figure drawn in ink, one end of which was broad and one end narrow. She saw the positions of this drawing as they actually were presented to her, not inverted. She knew right away what was meant by above and below.

She also knew the meaning of such forms as round and square, both as they looked to her eyes and as they felt when she traced them with her fingers. Upon request she would trace the form of a square or circle with her finger and then would point to a similar form on the page before her.

Yet, although she could recognize such objects as a key and a pencil case perfectly with her eyes closed, just from the feel of them in her hands, when they were placed before her on the table she could not tell which was which. She was able to see that they were not alike, that they were different objects, but she could not reconcile the appearance of either with the image she had formed from touching them.

How did the subjects feel about seeing for the first time? Was it the glorious experience that seeing people imagine it must be, to look for the first time on the beauties of the world?

The Ecstacy of Vision

The answer is both yes and no. Some of the individuals were ecstatic over the experience. Of one man it is reported that: "With the exclamation, 'I can see!' he became a changed man. His one object in life was 'to see.'"

For others the experience lacked any particular interest. They had learned to get along without sight, and they were inclined to continue in ther old ways, not making use of their new ability to any great extent.

Some were appalled by the multitude of confusing sights about them. One woman is reported as refusing to look

at an object shown her on the day following her operation saying, "that the light was offensive to her eye, and that she felt very stupid; meaning that she was much confused by the visible world thus for the first time opened to her."

The same woman reported later, "I see a great deal, if I could only tell what I do see; but surely I am very stupid." And "All that I can say is, that I am sure, from what I do see, a great change has taken place; but I cannot describe what I feel."

Fear of the sight of objects is another subject that interests the psychologist studying these cases. Are people born with an instinctive fear of the sight of certain shapes or things? The answer seems to be in the negative. None of the reports indicate that the subjects felt any particular fright upon looking for the first time at animals, or shadows, or any particular forms.

"We have failed to find good evidence that visual preferences, interests, or fears are unlearned or that reactions to distance are unlearned," Dr. Dennis concludes. "On the other hand, it may be urged that the negative results are not decisive for several reasons. The chief of these lies in the non-quantitative as well as in the incidental nature of the observations."

Further study of such cases and more detailed research from the psychological point of view is urged by Dr. Dennis.

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PHYSIOLOGY

Masculine Hair Bristling Due to Skin Thickness

WHEN Johnny answers parental reproaches about the tousled state of his hair with a despairing or even defiant "I can't help it; it won't lie flat," he is quite right. There is now scientific evidence for his contention, although neither he nor his parents are likely to know about it. (*Anatomical Record,* Feb. 25).

The general tendency of masculine hair to bristle, to stand on end and to resist steadfastly all efforts to flatten it is due at least in part to the thickness of skin on masculine heads. This appears to be the conclusion drawn from measurements made on nearly a hundred scalps by Elizabeth Upham and Walter Landauer of Storrs, Conn., Agriculture Experiment Station.

These scientists measured the thickness of top and under layers of skin and the angles between the hairs and skin. The thinner the top skin the smaller the angle, that is, the more sloping are the hairs, they found. Presumably, the more sloping the hairs, the easier it is to make them lie flat against the head, since that would seem to be their natural tendency. What is more, the Connecticut scientists found the thinner top skins on feminine scalps.

Hair angle and skin thickness are only part of the story. Even more important influences on the slope and direction of hair, the scientists believe, are the forces of stress acting on the skin during embryonic development. Which still gives Johnny a scientific "out." He really cannot help it if he was born with unruly hair.

The measurements also suggest a question of possibly considerable interest to Johnny's father. The average thickness of the top layer of skin, scientifically termed cutis, is smaller on female than male scalps, while the under layer, called subcutis, is thicker in women than in men, on the average.

Does the greater thickness of subcutis on feminine heads provide better anchorage for the hair and thus account for the lesser tendency to baldness among women? Or does the greater angle between hair and scalp in men make it easier for masculine hairs to fall out?

Unfortunately, science provides no answer at present. The Connecticut scientists do not even mention the cosmetically important matter of baldness. Still more unfortunately, science can probably provide no remedy for baldness even if the answer is yes. Finding a way to change the thickness of the skin layers on top of men's heads does seem beyond the ability of modern science, despite its many apparently miraculous achievements.

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New York State has been completely free from smallpox for over two years.

ARCHAEOLOGY

American Mummies Found Well Preserved

MUMMY bundles, removed from ancient graves in Peru, have been opened at the Field Museum of Natural History, revealing bodies of Americans well preserved since prehistoric times.

Desert-like dryness of the Peruvian coast is responsible for the state of the bodies, explained J. Eric Thompson, assistant curator of Central and South American archaeology.

Prehistoric Peruvian Indians did not usually preserve their dead by artificial devices, as Egyptians did, though resin was sometimes applied as preservative, and the viscera removed. In place of Egypt's mummy cases, South America had the custom of bundling a mummy in layer after layer of beautiful robes and shawls, with ornaments and personal possessions stuck in among the folds. A false head, added to the final shapeless pack, was usually a sign that the dead individual had been important, said Mr. Thompson.

Two 700-year old graves from the cemetery at Ancon, where the mummies were obtained, have been reproduced at the Museum, showing unopened mummy bundles surrounded by stores of food and household equipment. One grave contains women's work baskets, spindles, and silver ornaments.

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PALEOBOTANY

Infrared Light Useful In Study of Coal

INFRARED radiation, the "dark invisible light" that lies just below the lower end of the visible spectrum, has been found useful in the study of fossil leaves found in layers of coal, by Prof. John Walton, paleobotanist of Glasgow University. (*Nature,* Feb. 16).

Fern-like leaves in coal are usually studied by lifting them off, carefully spread out on some adhesive substance on a glass slide, which permits them to be handled under the microscope. Frequently they are so dark as to be quite opaque to both eye and camera, with ordinary light. But to infrared radiation many of them are transparent, permitting fine details of structure to be photographed.

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