I. Introduction

Although loss of visual function, the expected result of the lesion, is made evident by a failure to elicit a typical, discrete, visually evoked pattern, the lesion itself alters the function of the visual system in a more subtle manner. During the initial experiment in which the visual cortex was almost totally removed, we found that the animal was able to move deftly through a room full of obstacles and could reach out and catch a falling object. However, this ability has been reduced. Vision, although present, is now no longer of practical significance to a monkey, especially after the 6 years between the operation and the death of the animal. In 1952, Humphrey and Weiskrantz, removed the visual striate cortex from an adolescent macaque monkey. The animal, when tested, showed no improvement in vision and remained virtually blind. The lesion was confined to the visual cortex, and the animal's visual performance was not affected by it.

Abbrev. A. *Macaca mulatta*. 

*Macaca mulatta* vision in a monkey without striate cortex: a case study
Figure 1. Reconstruction of Herlin's brain. In the drawings of the surface of the brain block areas indicate absence of cortex, dotted lines show the boundaries of the occipital lobes below. In the cross-sections through the whole brain block areas show intact neocortical cortex.
in our first report (Humphrey and Weiskrantz, 1967) we were led to describe Helen's visual field as involving a substantial loss of visual field. Indeed, the initial report found it easier to see objects near the center of the visual field than for objects located further out. However, the authors noted that they could not detect objects within a short time when the object became visible to detect a missing light source, and that a stationary light source appeared a dark background, and finally a stationary light source did not last and within a short time the objects became visible. The authors also noted that the visual field would look at and reach for objects only if they moved.

Although Helen's visual field was actually closed, there are certain aspects of her behavior that are not yet understood. For instance, her ability to detect changes in the visual field is not as well understood as her memory. In their report, the authors note that their results are not consistent with the hypothesis that Helen's visual field is closed. The results of their study suggest that Helen's visual field may not be as closed as their initial hypothesis.


Figure 2. Helen's visual fields showing the probable extent of the visual field defect.

Perimetric to about 60 degrees from the fovea.

Figure 2. In Helen's visual fields, the probable extent of the visual field defect is shown. The field is divided into quadrants, with the lower right quadrant extending to 60 degrees from the fovea. The defects are indicated by the absence of light stimuli. The authors note that their results are not consistent with the hypothesis that Helen's visual field is closed. The results of their study suggest that Helen's visual field may not be as closed as their initial hypothesis. The results also show that Helen's visual field is not as well understood as her memory.

3.2. Behavior

Retaining of a normal eye.

Humphrey and Weiskrantz, 1967.

Humphrey and Weiskrantz, 1967.
It was hard to keep the horse clean enough to prevent hair from getting tangled in the fence. The fence was in place so the horse could not escape by running around. The fence was too high to pick up small bits of chaff that could fly into the horse's eyes. When a room became available for indoor arena was set up in which the horse could walk up and training could be used to develop their skills. There was no need to use a treadmill. The horse began to display extraordinary changes in behavior. On the one hand, the horse began to show signs of improvement in the previous behavior; these, in turn, led to other signs that were more closely related to the horse's natural behavior, which continued to develop in the environment.
Figure 3: A large in the wood at Washington.

...
Fishes, but this control was not attempted.

Tours, but this control was not attempted.

strictly standardized she would probably have learned to be rather better at recognizing discrimination tests suggested that if the size and brightness of the food items had been darker colored stimuli before lighter colored ones. The evidence of the object in sight—thus she would take larger bits of chocolate before smaller ones and

When she picked up objects in the arena she hesitated was almost always on the

In this situation, while she sat relatively still, the head was set up in front of the cage and attempting to approach the object while sitting in a tree. To confirm this ability to judge the distance of an object with its distance depended on the dynamic visual information provided during active movement. On the basis of this evidence alone it could be inferred that her ability to judge
Subjective. Acoustically, two control experiments were made: (i) she was seated in
obstacles. Accordingly, two control experiments were made: (i) she was seated in
vision, it could have been there she used referred sounds to detect the upright
though her aversion of obstacles placed on the floor was clearly based on
matrix of the stick square.
be walked round. Furthermore she avoided stepping on an outline square drawn on
with a regular array of about 1.5 cm square, this led to a blocky shape. On an outline square
right, she would simply move a safe but economical
boards of the stick obstacles—rather, she would simply move a safe but economical
spaces was nothing fancy or exaggerated. She just lacked the ability to
when the boards were given a blocky surface she quickly took to walking round them
think with a few days she began to move around these obstacles as if she had right
were placed in the arena at first she sometimes bumped into them, but
of the arena, I investigated her
elimination of an object in the visual field.
underwater (II). If unlabeled, therefore, that she judged distance simply by the
olved to neck height she sometimes tried to reach to a curtain from
image was used to neck height she sometimes tried to reach to a curtain from
the floor of the cafe performance was in no way disrupted (although when the
and pushing her upper arm through the cafe bars as far as she was able in order to
Vision in a monkey without striate cortex: a case study.
The presence of intense white noise—and it made no difference, (1) a transparent


N K Humphrey
Presented she was rewarded for reaching to the dummy.

A screen bearing a blank dummy's nose and either the positive or the negative stimulus were presented in new positions on each trial, and she was rewarded for reaching to the positive one.

The results showed that salience was greatly influenced by the size and brightness of the stimuli rather than the other; it was possible to obtain a measure of their salience immediately detectable. Hence, by varying the frequency with which she reached to find a target—it may be presumed that the one which was most
A conventional measure of acuity since what was almost certain done was simply
that the size was inferred. However, in our experiments at the
Department of Electrical Engineering—when contrasts to an angular separation of 0.8
incessant with 7 mm circles—were corresponding to an angular separation of 0.8
across 1 mm diameter, and when performance decreased. She scored
percentage found from 4 mm to 1 mm. Her performance decreased. She scored
performance found from 4 mm to 1 mm. Her performance decreased. She scored
percentage found from 4 mm to 1 mm. Her performance decreased. She scored

An attempt to measure minimal separable acuity was made. By getting Helen to
answer whether two distinct spots that were closer together than green were
able to be seen. If so, the minimal separable acuity was taken. The green
spots were inserted into the red background, with a green spot on a red background, and the red spots were inserted into the green background, with a green spot on a red background. The green spot on a red background was inserted into the red background, and the red spots were inserted into the green background.

The results of a test of color discrimination were somewhat at odds with the
results of the color discrimination test. This provided no evidence that the original
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central spot distracting her attention from the surrounding contour. Further tests
ability to detect the figures in the shape discrimination test. In fact, rather than the
diameter of the circle was increased to 20 cm. So there can be no question of her
Figure 11). Here she scored close on 100% and indeed continued to do so when the
her ability to discriminate a spot surrounded by a 6 cm circle from a spot on its own
not notice the surrounding contours. Accordingly, as a control, she was tested for
she was reaching for the centre of the figures it might have been that she simply did
she was reaching for the centre of the figures it might have been that she simply did
(see Figure 10). In one thousand trials she scored no better than chance. Since
perimeter: a black spot was placed at the centre of each Figure for Helen to reach for
Finally a study was made of shape discrimination. The stimuli were a black
circles; yet performance dropped to no better than chance if the brightness contrast
discriminating differential salience. Indeed it turned out that even with the larger
that she would have must be said. Highly motivated to do well and one must assume that she would have

But with the formal discrimination tests it is difficult to be so sure. The was it

of photoreceptors. It has been more than a matter of how Helen did by some clever kind

of Figure 4, the woman gained the insights that confirmed it, and to put it would

somehow, in the interpretation of visual functioning. (Cameron, 1996) and in this cross-

such evidence more clearly in reaching for objects not far away in the

reach, again from the neural dependence in the initial stage of corneal vision, no

l and others who examined Helen were sent to the lens in an area of cortex and

and others, who examined Helen were later to the lens in an area of cortex and

by reason to entertain this possible. All the relevant evidence is directly contrary to the

Without regard to her capacity for spatial vision, there is no reason to entertain this

case, the study would lose much of its significance if deprivation case

effect looking out of the cornea or her right eye, the intact visual field.

the effect that the right eye, with the intact visual field.

In this paper, to be published separately, but in outline the text

that she could make so little sense of what she saw

That effect the appreciably watching what was heard around her—despite the fact

in contrast to her entire state of visual equality. By the end of the study Helen spent

or myself.

those objects most familiar to her, whether the object was a cat or another monkey?

With the important exception of her special vision, she appeared in fact to be totally

of all these things—Helen could classify stimulus in terms of visual distinguish which

only when the thalamus

differentiate between 2.5 cm circles with a similar circle without a

implied that the company was true when she was required to discriminate a 1.5 cm
There have been numerous attempts to demonstrate that the visual system can distinguish between two stimuli that are identical in all respects except for the direction of motion. However, most of these attempts have been unsuccessful. Recently, two studies have suggested that the visual system may be able to distinguish between two stimuli that are identical in all respects except for the direction of motion. In one study, monkeys were trained to discriminate between two stimuli that were identical in all respects except for the direction of motion. In the other study, monkeys were trained to discriminate between two stimuli that were identical in all respects except for the direction of motion. In both studies, the monkeys were able to discriminate between the two stimuli. The results of these studies suggest that the visual system may be able to distinguish between two stimuli that are identical in all respects except for the direction of motion.
Tired, he plodded on, his eyes scanning the horizon. His waking senses were dulled, his mind clouded by the fatigue. He knew he was close to the edge of the forest, but his vision was hazy, his hearing muffled. He stumbled, fell, and rose again, his heart pounding in his chest.

"I must find the cave," he thought. "I must find shelter before nightfall."

He took a deep breath, trying to steady his nerves. He had been alone for too long, his mind consumed by thoughts of the unknown. He knew he was not the only one with these doubts, but he couldn't help feeling isolated in his own mind.

He remembered the stories of the ancient ones, the tales of their wise guidance. He knew they had been there, before him, facing the same doubts and fears. But he also knew they had not been alone, that they had relied on each other for strength.

"I must remember," he thought. "I must remember that I am not alone."

He began to move again, his steps slow and deliberate. He knew he was not far from his destination, but he was not sure how much farther he could go. His body was heavy, his mind clouded by the fatigue. But he knew he must continue, must find the shelter he so desperately needed.

"I must find the cave," he thought. "I must find shelter before nightfall."
coherent control of the central cortex in a direction perpendicular to the stimulated meridian, with a period of 6.5-32.9 μm. The central control of the visual field is more significant than the featural control.