Device treats blindness by sending signals to the brain

Tom Whipple Science Editor

A 30-year-old woman who has been blind for seven years has "seen" shapes and colours, thanks to a bionic eye that it is claimed could one day treat all forms of blindness.

The woman, who has not been named, received an implant in the visual cortex of her brain, and scientists said they were able to send signals to it that appeared to her as images.

They said the next step was to connect the implant to a camera on a pair of glasses, which could communicate with its electrodes to provide an electronic eye.

Trials of similar bionic eyes have already taken place at Manchester Royal Eye Hospital, where scientists have shown that devices placed on the back of the retina could send signals to allow people to see lines and shapes in the world around them. However, those could only be used on people whose optic nerve was intact.

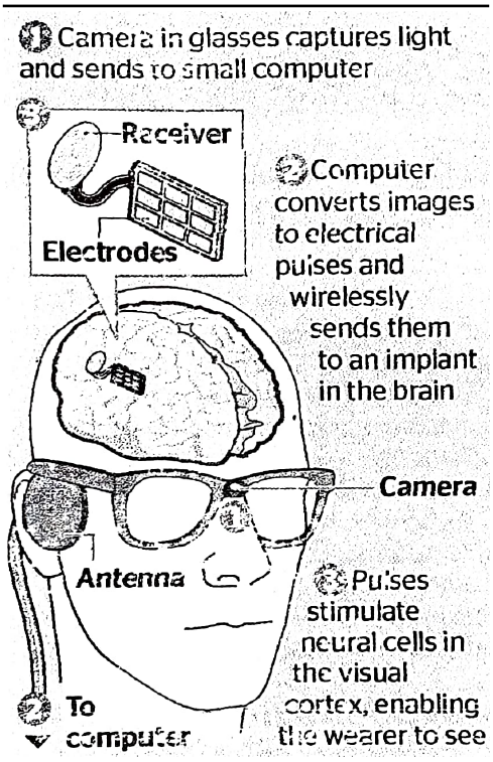
The new system, called Orion I, is designed by the same company, Second Sight. By bypassing the eye it is intended to be a solution for people with all types of blindness, or even those who have lost their eyes entirely.

"It is rare that technological development offers such stirring possibilities", said Dr Robert Greenberg, chairman of Second Sight.

Over a series of tests and operations by doctors from the University of California, Los Angeles the woman, who suffers from a rare condition called Vogt-Koyanagi-Harada syndrome, had an array of electrodes inserted into the back of her brain. An antenna was also connected through a hole in her skull.

Doctors then sent signals to it, and she reported seeing them. They are now awaiting permission to connect it directly to a camera in the hope that they can retrain the woman's brain to recognise visual stimuli. Even though they have not yet performed this crucial final step, they said they were cautiously pleased with the progress so far.

How it works



"This initial success in a patient is an exciting and important milestone even though it does not yet include a camera", said Dr Greenberg. "Bypassing the optic nerve and directly stimulating the visual cortex, the Orion I has the potential to restore useful vision to patients completely blinded due to virtually any reason, including glaucoma, cancer, diabetic retinopathy, or trauma. Today these individuals have no available therapy and the Orion I offers hope, increasing independence and improved quality of life."

At the moment no one is pretending that the system will produce anything approaching normal sight. Nevertheless, the work in Manchester has shown that even the restoration of modest amounts of vision can significantly improve people's lives.

Earlier this year Rhian Lewis, 49, spoke about receiving a bionic eye that worked using a retinal implant. Although it had nowhere near the resolution required to allow her to read or perform tasks that most take for granted, she described it as "like Christmas Day". "Within seconds, there was this flashing in my eye, which has seen nothing for over 16 years, so it was like, oh my God, wow!" she said. "When I locate something, especially like a spoon or a fork on the table, it's pure elation. I get so excited."

Dan Pescod, of the Royal National Institute of Blind People, said the research was at an early stage, but added: "This is a very exciting and potentially life-changing development."