Artificial Vision
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There are 1.1 million people in the United States and 42 million people worldwide who are legally blind. Blindness is more feared by the public than any ailment with the exception of cancer and AIDS.

One of the leaders in the race of constructing “perfect artificial vision” is the Dobelle Institute. It is among several institutions trying to create a new cornea through technology.

The Dobelle Eye consists of a sub-miniature television camera and an ultrasonic distance sensor, both of which are mounted on a pair of eyeglasses. The sensors connect through a cable to a miniature computer, worn in a pack on a person's belt.

After processing the video and distance signals, the computer uses sophisticated computer-imaging technology, including edge-detection algorithms to simplify the image eliminating "noise." The computer then triggers a second microcomputer that transmits pulses to an array of 68 platinum electrodes implanted on the surface of the brain's visual cortex.

Bringing wires through the skin without discomfort or infection is one of many independent inventions that has made the new visual prosthesis possible.

When stimulated, each electrode produces phosphenes or small points of light. These lights don't appear in one spot but are spread apart like stars in a dark sky. And not all are alike, some are pinpricks whereas other appear as odd shapes or squiggles. Some blind subjects even see them in color.

During the four hour operation computer jacks called *percutaneous pedestals* are sunk into both sides of the skull. Underneath, resting directly atop the surface of the brain, lie electronic implants encased in biocompatible plastic. The implants are tiny platinum electronic arrays about the size of a quarter.

Once the operation is complete, Dr. Dobelle has to map each individuals visions of phosphenes by sending pulses to their implants. This way the computer could be programmed to translate the video in a way that made sense to the brain. Weeks are spent using the actual camera and teaching the brain to interpret the dots. The images that the person sees are not at all like normal vision. At best, you see large objects in front of you in a dot matrix pattern.

Dobelle collects the locations of these dots like pixels on a screen in order to build the patient's map, layer by layer. The first layer was individual phosphenes, the next layer is multiples. It is necessary to know where an individual’s phosphenes appear in relation to each other so a video feed can be translated in a way that makes sense to the mind.

Initially they set the computer to send data to the electrodes at 1 frame per second, and then gradually increased.

As early as the second day of these procedures, the patient is able to find object in a room, and even navigate a car in a parking lot.

All operations were performed by neurosurgeons working in Portugal due to FDA regulations that still prohibit the procedure in the United States.

Knowing all this, imagine what we will see in the future: direct connection to computer, internet, television, Night vision, x-ray vision, telescopic zoom and microscopic focus, infrared vision….