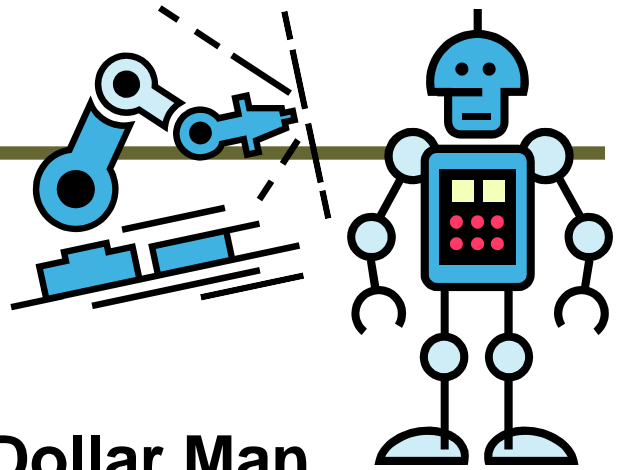


science FRONTIERS



The 10-Million-Dollar Man (Bionics)

Science fiction authors enjoy writing about things that have only been dreamed about, such as being able to replace damaged body parts. Today, biomedical engineers are working with doctors to make some of those dreams come true.

At Imperial College in London, England, researchers are looking for a way to help the body re-grow damaged bones. Their unique approach involves a new type of glass that can dissolve inside the body. Once inside, it activates genes that produce calcium. Scientists hope to be able to use this new substance to help grow new bones.

Several universities are researching **prosthetic** (*an artificial substitute for a missing part of the body*) eyes. In order for the brain to tell us what we are seeing, eye cells that receive light must pass on the information to other cells until the message reaches the brain. If the first layer of cells is no longer working, the message doesn't reach the brain, even though the rest of the eye may be working. This is the type of blindness caused by macular degeneration or retinitis pigmentosa. Prosthetic eyes can fix that problem. Even more amazing are the Swiss scientists who are working with a type of algae that has a light-sensitive protein—which helps the plant orient itself to light to carry out photosynthesis. When these scientists experimented with giving that protein to blind mice, the mice were able to see!

What about new feet? People who have lost a foot can only dream about walking normally again. Some are lucky enough to get a computer-controlled foot that imitates the body's natural **gait** (*how the foot moves*). Others may get a prosthetic foot made of carbon fiber. None of the options is ideal. Now, a mechanical engineer in Colorado is perfecting a flexible, artificial foot with a joint that even lets the user walk on uneven surfaces.

In Clearwater, Florida, prosthetic specialist, Kevin Carroll, has been working with a team to create a prosthetic tail for Winter, a dolphin who lost her tail as a result of being caught in a crab trap near Cape Canaveral. In the process, they are learning lessons that will help human amputees.

Questions for Research

- What are some of the challenges facing scientists at Imperial College?
- How does the work of scientists compare with Jesus' healing?
- How could Swiss scientists know that their mice were able to see?
- Why is it difficult to design and build an artificial foot or tail?

Research Ideas

Prosthetics, artificial organs