

## Modern Prosthetics

Technology Meeting 4 May 2021

This was a presentation of four different lectures about the combination of modern prosthetics, biology and technology.

The first very short lecture was given by an 'inventor' who had been requested by the US Department of Defense to devise a prosthetic arm for maimed soldiers to replace the existing unsatisfactory versions. The lecture included a short film of a new prosthetic arm developed by the inventor. In this film we saw a man demonstrate a variety of tasks with the new arm, such as picking up a piece of paper, taking it up to eye level, turning it through 180 degrees and then putting it down again, picking up a glass of water and even a shot of the man scratching his nose! The main objective of the Department of Defense was to have a much improved version of a prosthetic arm to increase considerably the independence of soldiers who had lost both arms. Losing just one arm was thought of as an 'inconvenience' by the Department.

The second lecture, entitled 'Twelve pairs of Legs', was given by a woman who described herself as a model, an actress, an athlete who was a record breaker in the 1996 Paralympic games and an 'advocate for women in the next generation of prosthetics'. She saw the body as a place of empowerment where the twelve pairs of legs helped her to achieve her ambitions. One picture showed her running whilst another showed her as a mermaid with a bionic tail.

This lecture may be thought of as inspirational if it encouraged others to follow her example and achieve their ambitions. The audience seemed to warm to her enthusiasm judging by the noises they made.

Although these first two lectures seemed very different in their approaches to the subject they were in fact different approaches with the same objective, the first to increase the independence of the soldiers and the second for empowerment. It is perhaps interesting to note that these words have a very similar meaning.

The third rather technical lecture dealt with the important issue of how the person is able to tell the arm what to do. In the early days this was done using mechanical means, such as shoulder power and bicycle chains but this was laborious and not very effective. It was realised that even when a limb is lost the muscles and nerve tissues still exist so in the last few years prosthetic arms have been developed which use a nerve or biological interface which is described in this lecture. These arms are so sensitive that the hand can actually feel the texture of the surface. The lecture included short films of people demonstrating both the old and the new methods of control.

The fourth and final lecture was about 'new bionics that let us run, climb and dance'. The lecturer lost both legs in a climbing accident and he describes his feelings and his determination to get back to climbing using bionic limbs, both in a technical and quite personal way. One picture shows him climbing on a near vertical rock face with his bionic feet which were specially designed for the purpose.

The lecture also included an interview with a dancer who lost her left leg in the Boston bombing attack at the time. There is a short intriguing film of her dancing which also simultaneously included

a skeleton figure showing her movements. The lecture included a live dance sequence of the dancer, with her bionic leg, which was her first performance since the bombing. Of all the four lectures I found this the most moving.

These four lectures gave a good insight into modern prosthetics. Not just about the technical side of the actual limbs but also about the horrific effects of losing limbs and how the people themselves coped in their various ways as we saw in the lectures. Who can forget such images as the man learning to walk again after losing one arm and both his legs? Or the man with the prosthetic leg climbing in the mountains? Or the young lady learning to dance again with her prosthetic leg as we saw in the last lecture? The bionics gives the wearers the empowerment and the self-confidence to act for themselves with the return of at least some degree of independence.

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