



HOW SCIENCE AND TECHNOLOGY ARE CHANGING SPORT

If you watch any sports event, you'll almost certainly see athletes setting new records as they become faster and stronger. As we learn more about genetics and biomechanics, and as we develop better types of technology, athletes will continue to improve their abilities and become capable of feats that were impossible to imagine just decades ago.

(1)

TECH-ENABLED TRAINING

We all know that if you train hard, you get faster or stronger. But new technology is helping coaches to decide more precisely what to focus on in training. Before, coaches could only stand and watch their athletes, or at most film them, in order to make suggestions about how to perform better and improve their technique. Now, with three-dimensional modelling and biometric feedback on things like heart and breathing rates, an expert can see far more about what's happening with an athlete's body. Thanks to biomedical engineering, coaches can know exactly how their athletes are moving and how their bodies are reacting. This allows them to give immediate feedback to the athlete and helps athletes to really enhance their performance.

(2).....

PERSONALISED BIOLOGY AND GENETICS

We're learning more and more right now about how genes interact and lead to different traits and behaviours, and that knowledge will transform sport, along with everything else. Your genes might make you respond better to certain types of workouts, and knowledgeable coaches will have the chance to come up with individual exercise plans based on that information in case they are able to give their athletes an edge.

(3).....

And it's not just a question of genes. An athlete's muscles are also influenced by training, environment and diet. Understanding how all these things interact can help coaches design workouts to enable athletes to go beyond their present limits.

Of course, to become the best in any area of sport, it isn't only about physical preparation. It also requires mental training and developing essential psychological characteristics such as determination and tenacity. Mental strength can help your body keep going when you feel like you're done and you think to yourself: 'I wish I could stop right now!'. Psychology and neuroscience can help us learn how to coach someone through to the end of an ultramarathon, for example.

AUGMENTED REALITY AND ARTIFICIAL INTELLIGENCE

Augmented reality (AR) could also have a major impact on sport. AR allows you to see the world, but with extra data added on. So, in the world of American football, AR could allow the players to get live information from their helmets, reminding them of their next moves, for example. Or, taking the idea one step further, some kind of algorithm could be used to make intelligent guesses about the rival team.

(4).....

FAIRNESS

Of course, some of these innovations, particularly technological ones, prompt questions about fairness. Modern runners benefit from new shoe technology, for example. If only great athletes from the past had had the same technology. If they had had the same shoes, would they have been even faster than today's athletes? Is it right to compare the speed of someone wearing performance-enhancing running shoes to someone without them?

(5).....

Perhaps the people who decide the rules of a particular sport will one day decide to ban some new technological advance or other. Until then, as long as science and technology keep improving, we'll continue to get faster and stronger.

a Although such an example may seem **far-fetched**, if players had a system like that, one day maybe they would be able to read the **line-up** of opposing players and make a guess as to what their next move would be, informed by a quick search through videos of old games. At that point, your IT department becomes just as essential as your **scouting** team.

b These are questions that society will have to answer one day. Unless it does, everything will be open to debate. Because whatever happens, and whatever we think of it, technology will continue to push the limits of sport, in both minor and major ways.

c Meanwhile, some experts expect to see sports people training with masks that provide a higher level of oxygen while they work out, something which has been shown to help an athlete push harder than they normally could.

d While many of the benefits of this type of information still lie in the future, there are already genetic markers that can tell how well a particular athlete's body will react when they do specific workouts such as weight-training or intensive sessions.

e Of course, there's one central question here: supposing technology keeps improving, will there be an absolute maximum limit to what we can do? Will we ever hit a point where training and technology will go beyond our physical capabilities? If we look now at all the new ways to maximise our bodies' and brains' performance, it seems those limits may still be some distance away.