LATERAL THOUGHTS

Anti-gravity meets fantasy football

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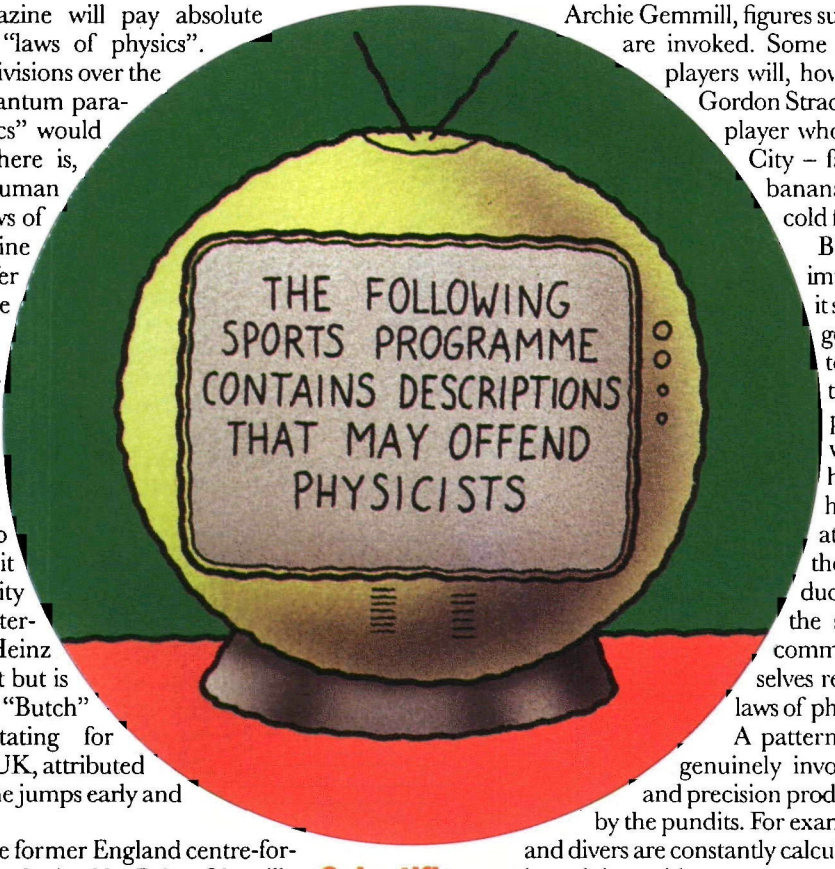
Anti-gravity meets fantasy football

Those reading this magazine will pay absolute homage to the so-called "laws of physics". There may be interesting divisions over the exact interpretation of quantum paradoxes, but "classical physics" would find us mostly united. There is, however, one area of human endeavour in which the laws of physics come under routine and flagrant violation. I refer to sport, and in particular the football field.

The most common exemption from the laws of physics given to sporting maestros is their licence to "hang in the air". This phrase is used as ubiquitously as if it required no explanation. Occasionally, it even gives way to "the ability to hover". The German international footballer Karl Heinz Riedle, is of average height but is prodigious in the air. Ray "Butch" Wilkins, while commentating for Channel 4 television in the UK, attributed this ability to the fact that "he jumps early and hangs in the air".



Shortly after his death, the former England centre-forward Tommy Lawton was eulogized by Brian Glanville in the *Guardian* newspaper. "The scientific evidence," wrote Glanville, "suggested it was more than legend – that he could actually hang in the air before a header." I would be interested to know the source of Glanville's scientific evidence, although the National Physical Laboratory might not be so keen. Interestingly, Lawton was also described as having scored "an infinite amount of goals with either foot". Meanwhile, Howard Kendall, the manager of Everton, said the following about Alex Dawson of Preston North End: "It was uncanny really – he almost seemed to float towards the ball."

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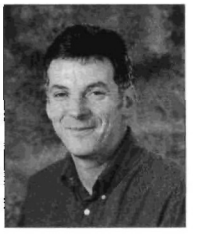
But hanging in the air is not confined to footballers. In cricket, the ball in the famous dismissal of Mike Gatting by the Australian bowler Shane Warne, was said to "hang in the air for an instant, swerve in at Gatting's pads, then abruptly change its mind and skim the other way". As far as the sports aficionados are concerned, Isaac Newton might never have existed.

Universal gravitation is not the only law under threat. We have all seen a footballer strike a ball low towards a goalkeeper on a wet pitch – only to be told by those in authority that the goalkeeper fumbled the ball when it skidded on the turf because it was a "speculative shot that picked up momentum off the wet grass". For some reason it seems that only wet turf can impart such momentum.

Clausius told us that there is no such thing as a perfect heat engine. However, no football player in any league has ever failed to convert less than 100% of his available fuel resources into mechanical work on behalf of the team. An unspoken agreement exists that 110% is the level of attainment that all players should strive for. And when managers wish to emphasize the work rate of exceptionally hard-working players, like Alan Ball or Archie Gemmill, figures such as 200% or even 300% are invoked. Some of these entropy-defying players will, however, hint at their secret. Gordon Strachan – the former Scotland player who now manages Coventry City – famously overindulged on bananas and porridge. Forget cold fusion, pass the oatmeal.



But some sports seem to be immune to violations. Indeed, it seems that the closer a sport gets to a Newtonian bagatelle, the fewer the violations. Snooker, for example, proceeds in its Newtonian way. No player, no matter how mercurial, appears to have the ability to cut a ball at more than 90°. And although the use of spin produces remarkable effects on the snooker table, the sport's commentators restrain themselves remarkably and bow to the laws of physics at all times.

A pattern is emerging. Sports that genuinely involve dynamic calculations and precision produce no reference to it at all by the pundits. For example, ice-skaters, gymnasts and divers are constantly calculating angular momentum in real time with uncanny precision. Yet almost no reference is made to this ability; pundits concentrate instead on concepts such as "artistic impression". But those sports that involve little in the way of Lagrangians or Hamiltonians are full of antigravity-defying players and demon-possessed balls.

Clearly, the scientifically minded sports fan could attempt to explain how Tommy Lawton used to manipulate his centre-of-mass to create the illusion that he could hang in the air. But that's not what most people want. They actually want to believe that Lawton could hang in the air. Not forever, of course; ultimately, we all need gravity.

But couldn't there be a wee bit of latitude for the truly gifted? Perhaps they could borrow from the rest of us ordinary mortals, so that when Desmond Lynam – the BBC's suave TV sports presenter – leaps into bed at night, he could accelerate at more than 9.81 m s^{-2}, so that Karl Heinz Riedle might fall less quickly. This might seem fanciful, but discussions of zero-point-energy abound in the physics community, and it is now perfectly feasible to ask "Does the fabric of empty space really contain a plenum of energy?" in serious publications.

Of course, my thesis could be demolished if sports commentators were simply using metaphor. They are, after all, not averse to the odd metaphor – usually of the mixed variety. But my own feeling is that the violations I have listed above constitute more than metaphor. The ability to push the envelope of physics is somehow part of the mark of sporting greatness, and prosaic physicists should stick to their oscilloscopes and leave well alone.

Doug Small is principal physicist in the Department of Urology and Clinical Physics, Southern General Hospital NHS Trust, Glasgow, UK