The evolution of sport 1945–2000

Part 1

John Ireland addresses the issues that influenced the characteristics of sport and participation in Britain in the second half of the twentieth century

The period after the Second World War saw further expansion of sporting interest. The British people were eager to return to sports grounds and major stadia to enjoy live competition.

The early standout spectacle was the 1948 London Olympic Games. The event was known as the 'Austerity Games', as little money was available after the war. Despite continued rationing and financial hardship, Wembley Stadium and other Olympic venues were filled to capacity. The Austerity Games made a profit, a feat not repeated until Los Angeles 1984 and the advent of commercial sport at the Olympics.

Professional football attracted over 41 million spectators in the 1948/49 season. Rugby league also attained record highs in the same year, with 7 million passing through turnstiles. However, 20 years later, football crowds had fallen to 27 million and more than halved in rugby league, due to the appeal of television and other forms of entertainment.

County cricket experienced a similar graphic. Attendances slumped from 2 million to 600,000 by the mid-1960s, prompting a drastic reshaping of the game and its class-based image. It must be remembered that most of the play occupied midweek, when many people were at work.

While crowd numbers were in decline, participation in sport gradually increased throughout the twentieth century. These trends may be attributed to a series of political policies, technological advances and sociological changes that emerged during the postwar period. While impacting on traditional class structures, these factors also significantly accelerated the evolution of sport.

Class divisions

Class division remained during the postwar decade (1945–55), but was beginning to lose influence. Britain was regaining economic stability after military conflict. It was a time of austerity, but optimism prevailed, with the help of innovations from the newly elected Labour government. The New Towns Act 1946 addressed the issues of slums and bomb-damaged housing, and the National Health Service (NHS) was founded in 1948.

Equalisation of food intake between social classes became a political priority. Free school milk was distributed daily to all children and orange juice made available without charge to expectant mothers. Malnutrition among working-class people was reduced considerably in the 1950s. Consequently, children born into the working classes developed to become bigger, stronger and healthier.

This impacted on sport. For example, in the period up to the 1960s the average weights of professional footballers and rugby league players increased, adding a new physical dimension to these games. As a result of better diet, there was a sharp decline in the number of flyweight boxers (52 kg). Hundreds competed in this category before the Second World War, but only eight were registered by the end of the century.

The urban working classes remained enthusiastic about association football, while middle-class recreation centred on suburban rugby union, cricket and tennis clubs. Those aspiring to the middle class tended to play sport, whereas manual workers preferred to spectate.

Rugby union

Throughout the 1950s the Rugby Football Union (RFU) continued to operate along the conservative lines established by public schools and universities. This example was adopted readily by grammar schools in order to reflect middle-class values.

The image of rugby union was modified by rule changes in 1968. Gradually play began to appeal to a broader cross-section of followers. In 1995, following the popularity of the Rugby World Cup, rugby union finally went professional, arguably abolishing its class boundaries.

Class exclusivity and many former traditions previously apparent in rugby union were swept aside in 1995. After over a century of amateurism, the governing body embraced professionalism and commercialism. In a process of de-institutionalisation, the 'Old Boy' tradition became obsolete, to be replaced by a business operation reliant on a fiscal hierarchy.

Cricket

The Marylebone Cricket Club (MCC), founded in 1787, assumed the role of governing body of cricket and continued to have primary responsibility for the game's laws until 1969. The MCC committee comprised men of economic and social privilege. Into the 1990s, members were still elected from the social elite and most were privately educated.

This conservative governance was forced to introduce a 1-day version of the game in 1962 in order to invite sponsorship to generate much-needed revenue. The modern abridged format did not sit well with traditionalists, but was successful, and expanded to be played internationally in 1977. The game changed significantly, becoming faster and more exciting. From this point, cricket for both players and spectators became far more **egalitarian**.

Significantly, football surpassed cricket as the national game in the late 1960s. This was only partly due to World Cup success in 1966. It was more to do with the British public rejecting the values of **imperial Britain**, on which the ethos of cricket was founded. The values of professional football and its association with working-class culture had become more relevant.

Revolutions

Coal mines were closing by the early 1960s, and industries like ship building fell into decline. **Footloose manufacturing** was emerging, e.g. motor vehicle production. New factories were often developed in locations determined by government policy, redistributing the workforce. Employees in traditional industrial areas moved to new jobs for increased pay and better conditions, often in the new towns such as Stevenage and Newton Aycliffe.

In 1957 Prime Minister Harold Macmillan commented that:

> Most of our people have never had it so good.

Increased affluence enabled workers to purchase luxuries like televisions. Crucially, cars became affordable to working men. Leisure facilities were built in new settlements, making sports like golf and squash accessible to manual workers for the first time. The era of prolific road construction coincided with a wave of 1960s prosperity, and working families were able to purchase cars. While this aided mobility for sporting purposes, e.g. travel to new sports complexes, it also opened up alternative opportunities for leisure, e.g. outdoor activities in national parks.

Expensive commodities, once the preserve of the upper classes, became more readily available to industrial workers. Furthermore, private transport and modern leisure facilities allowed leisure activities to be pursued as alternatives to spectatorism, contributing to the reduction in sporting attendances.

KEY TERM

Footloose manufacturing Industries not tied to a location by raw materials. For example, cars can be built at any chosen location.

KEY TERMS

Egalitarianism Equality across society.

Imperial Britain Relating to the values of the British Empire, which at its peak was the largest in history.

Significantly, young people experienced a social revolution during the 1960s. The rejection of the old order and societal values was made clear in musical and fashion trends. Sport both aided and reflected changes and the breaking of class barriers. Distinctions that were clear and restricting in the early 1900s became vague and unencumbering by the end of the century. As predicted by George Orwell, Britain seemed to be 'moving openly and obviously towards egalitarianism'.

The end of the amateur

Although payment for performance was not a new concept and **shamateurism** had been a feature of some sports, the real growth in professionalism did not take place until the third quarter of the twentieth century.

According to Harvey's *Encyclopaedia of Sport*, over 60 sports were played in Britain by the end of the 1950s. Most participants played for the love of the game and few received full-time payment that constituted a living wage. Only six sports had significant numbers of professionals by 1960 (Table 1). Despite the split from rugby union, rugby league was a semi-professional sport — players were not considered to be regular professionals.

The 1960s marked a watershed, during which amateur players disappeared from top-class sport and the professionals grew both in status and wealth.

Tennis

British tennis had strong amateur traditions, shown when Wimbledon champion Fred Perry rejected convention and turned to professionalism in 1936. He was ostracised by the tennis establishment for 50 years.

In 1967 the BBC sponsored and broadcast the Wimbledon World Lawn Tennis Professional Championship (Wimbledon Pro). It was the first tournament at Wimbledon that was open to male professional players. Winner Rod Laver was awarded £3,000.

The success of the tournament demolished the barriers associated with amateurism. At the end of the year, professionals were allowed to enter Wimbledon, and tennis began its international **Open Era** from 1968. From this time on, top-level tennis was dominated by paid players.

Cricket

The distinction between amateur and professional cricketers, who often played on the same team, was abolished in 1963. Before this time, captains of England were required

Table 1 Professionalism in 1960

Sport	Number of professionals	Background
Cycling	7,000	This number is high but is misleading, as this relates to racing licences only. Some cyclists made up sponsored teams that competed in events like the Milk Race. Few made a living out of competitive cycling.
Football	4,000	Players operated in 92 clubs in four English divisions. There were also Scottish divisions and semi-professionals playing in non-league teams. Numbers declined after the abolition of the maximum wage in 1961.
Boxing	1,700	This number rapidly declined after the postwar decade. Regular boxing tournaments became uneconomical and were stopped. Top boxers competed occasionally, while lower-ranking contestants had too many bouts and suffered adverse health effects.
Golf	1,500	Most professional players were engaged as club professionals and coaches. They also earned by selling equipment. There were few competitions. Less than 20 players had sustained success in tournaments.
Cricket	300	Professionals were engaged by the counties. At this time they played alongside amateurs. An additional 50 had contracts as semi-pros in local leagues.
Horse racing	270 (170 flat race jockeys, 100 steeplechase jockeys)	Flat racing was of higher status and more lucrative. Some jockeys had success at a young age and enjoyed long careers, e.g. Lester Piggott rode his first winner at 13. Most, after recruitment as apprentices, never progressed beyond the status of 'stable lads'.

to be amateur. They often attended renowned public schools and universities, and it was believed that upbringing within a privileged family background and selective education made amateur cricketers more suitable for leadership both on and off the field.

Previously, amateurs were termed 'gentlemen' and addressed as Mr or Sir while playing. They had their own, often luxurious, changing rooms and often entered the field of play via a separate gate. On the other hand, professionals were addressed merely by their surnames and changed in basic facilities.

While on tour the amateurs received expenses, while the professionals drew payment on which they were taxed. Therefore, amateurs frequently emerged from the sport with more money than professionals.

Football

Association football best illustrates the growth of sophisticated professionalism that occurred in this era.

The 1953 FA Cup final is famous for the performance of legendary Blackpool player Stanley Matthews. The match signified a new era, as it was the first time the showpiece had been televised. Television sales increased and supporters were no longer restricted to attending football venues in order to watch their team. However, it wasn't until the 1960s that the Football Association (FA) allowed coverage of European and top-division games. As television began to pay to broadcast live matches, the foundation of commercialism was laid. Professional sport therefore entered the *golden triangle* of sport, media and sponsorship (see PE REVIEW, Vol. 15, No. 2, pp. 2–6).

Alongside media involvement came a revolution among professional players. In 1961 the maximum wage for footballers was abolished. For the first time, payment overtook wages received by skilled manual workers. Payments to footballers were no longer uniform, and rates differed within teams.

The resulting acceleration of playing salaries caused significant repercussions. Management came under pressure to generate revenue, as players were granted 'freedom of contract', allowing the most talented to seek higher rewards at richer clubs. Football had become a business and the structure that previously shared profits to support smaller clubs was dismantled.

With the golden triangle fully established, the ultimate step into commercialism came with investment from Sky television, leading to the formation of the Premier League in 1992.

Global and professional

The process steering the most popular sports towards professionalism with the inevitable demise of the amateur ethos was not an internal force applying exclusively to Britain. Global

innovations guided the evolution of sport towards commercialism.

In the 1970s, owner of Australian Channel Nine Kerry Packer controversially established World Series Cricket, which contravened the traditions of the English game with its roots in public schools. It was dubbed a 'cricket circus' by critics, but the legacy of this venture — with its limited-over games under floodlights, temptation of international stars with lucrative payments, and coloured kits in place of the customary white clothing — changed cricket forever.

The 1984 Los Angeles Olympics were the first to be associated with commercialism. Previously the Games had been funded by the host countries, often leaving them in huge debt. Businessman Peter Ueberroth was appointed to make Los Angeles a commercial success. He required media companies to pay large sums for television and radio rights, persuaded private companies to build facilities and invited sponsors to invest. Most importantly, in order to attract a large global audience, Los Angeles was the first Games to allow professionalism. The Games made a profit and the Olympic movement was locked into a commercial framework that required athletes to be professional.

Overall, the acceptance of professionalism by all major sports and the development of commercialism during the late twentieth century elevated status, generated excitement and created a common appeal evident in contemporary sports presentation.

The evolution of sport 1945–2000 Part 2

John Ireland continues his look at the evolution of British sport in the twentieth century

Middle-class women participated in a limited number of sports from the end of the nineteenth century, and the sports deemed suitable for women were chosen by men. Even after the Second World War, female contributions to sport were undervalued compared to male competitive performance. This chauvinistic attitude was both unfounded and unjustified.

Sport and gender

By the 1960s, 800 clubs were members of the Ladies' Golf Union. However, despite the emergence of the inspirational Laura Davies as professional champion, gender inequality in terms of pay and status prevailed into the twenty-first century.

Tennis was played by more women than men during this period. Spectators at Wimbledon were mostly women. This female participation had a middle-class orientation.

Tennis player Althea Gibson was raised in the deprived district of Harlem, USA, and in 1957 became the first black player to win the Wimbledon singles championship. Her success and athleticism helped change the perception that women's sport was less exacting than men's sport.

Wimbledon champion Virginia Wade became a strong role model for women's sport in general by being voted BBC Sports Personality of the Year in 1977. By 1991 the Women's Tennis Association was demanding that tournaments pay women the same prize money as men. Thanks to successful negotiation and with the aid of endorsements, Monica Seles became the richest female athlete in the world, with earnings of $24 million. A statement regarding women's professional status in sport had been made.

Other sports

Badminton was a popular winter game immediately after the Second World War — and deemed suitable for women. Facilities were limited to church halls, and London County Council supplied only six courts by 1950. This figure rose to over 500 in the 1960s as sports centres were developed.

Hockey was a traditional women's sport, but was considered a middle-class game. By the 1980s many clubs were administered by women and the men's game remained marginalised despite the British team winning gold at the 1988 Olympics.

Participation in netball increased markedly, with over 6,000 schools and clubs registered with the All England Netball Association (now England Netball).

At the time, women's sport was hampered by limited pathways leading to excellence, fewer facilities and less competitive opportunities than were available to men. Most importantly, there was a lack of finance and coaching to nourish women's sports. This was to change significantly in the early twenty-first century.

More opportunities

At the beginning of the 1970s, only 25% of married women were in employment. By the end of the century, this had risen to 75%. Along with the development of the birth control pill and the availability of domestic labour-saving appliances such as washing machines, this led to women enjoying increased freedom with which to pursue leisure activities.

Women took advantage of multi-purpose leisure centres built during the 1970s. Those with more wealth chose private health clubs, which also began to flourish. Televised 'keep fit' classes for housewives and promotion of aerobics by celebrities stimulated women's gym culture. By 1990 the women's fitness clothing market was worth £60 million.

Women's participation began to increase in traditionally male-dominated sports. The ban on women's boxing was lifted during the 1970s, and 30 female boxers were registered on the unofficial British circuit. Contests were held in gyms and pubs, though at the time the sport was still not recognised by the British Boxing Board of Control.

Women's football had flourished during the First World War, but then was effectively banned by the FA. The ban was relaxed in 1971, but the FA did not apologise for hampering the development of the women's game until 2008.

The Women's Rugby Football Union (WRFU) was formed in 1983 with 12 clubs. Ten years later, over 2,000 women were playing every week with 50 clubs registered in a two-divisional structure. This was not enough for some — many rugby union clubs had male-only bars, and one club in the northeast rejected female membership entirely until the 1970s.

The inaugural international between England and Wales took place at Pontypool in 1987 and provoked protest, with one leading RFU figure asserting: 'Ladies do not play rugby.' The success of the women's game since has proven him wrong.

Sport in school

The Education Act 1944 ('the Butler Act') placed emphasis on the development of the 'whole person' rather than on academic tuition alone.

Althea Gibson became the first black player to win the Wimbledon singles championship in 1957

The school leaving age was raised to 15 years, and three types of schools were established as a result of the Act's tripartite system:

- grammar schools
- technical schools
- secondary moderns

The 11-plus examination taken during the final year of primary school determined which school a pupil was eligible for. The traditional public schools (see pp. 27–29) continued to exist as private, fee-paying institutions, and were unaffected by the Butler Act.

Success in the 11-plus led to grammar or technical school. Grammar schools focused on a broad curriculum that led to qualifications and university. Technical schools featured an emphasis on technical skills that did not exist on the grammar school curriculum. Failure in the 11-plus led to the secondary modern, where the curriculum was designed to prepare young people for lives working in industry.

Grammar schools gave children from traditional working-class backgrounds the chance to become upwardly mobile in Britain's social structure. Rugby player Fran Cotton was born into a coal-mining family in Wigan in 1947. He first experienced rugby union at grammar school, and went on to play at the top level and represent England and the British Lions. He also founded a successful clothing business.

Different sports

Physical education was compulsory at all types of school. Secondary modern inter-school sport usually took place during the week, and facilities tended to be inferior to those of the grammar sector. Boys' secondary moderns in the traditional industrial areas of Lancashire and Yorkshire tended to encourage football and rugby league, reflecting the culture of the working classes of this period.

Grammar school sports fixtures traditionally took place on Saturdays during term time. The sporting ethos was modelled on the public schools and included inter-house competitions. Many boys' grammars dispensed with football and replaced it with rugby union, the latter remaining rooted in middle-class ideals.

By the early 1970s, comprehensive education began to gain favour in Britain. Larger schools combined the three different types of institution from the tripartite system and schools became an eclectic mix of academic abilities, providing wider educational opportunities and better facilities.

The Education Act 1988 had an impact similar to the Butler reforms, giving local government to schools and implementing a national curriculum. The latter was designed to facilitate equal opportunities across the education spectrum.

Transport

Railways were vital in the growth and spread of sport in Britain. Thousands of spectators continue to travel by train today. Until the 1960s, many teams used trains to reach away venues. After this time, numerous branch line and outlying stations were closed by the Transport Act 1962 following the Beeching Report.

Air travel made European club football possible from the 1950s. However, travel by aeroplane was not always economical. Up until the mid-1960s, international teams sometimes still sailed to destinations, e.g. the Australian cricket team travelled to England by ship in 1964. Such tours occupied months, and touring cricket and rugby teams completed heavy fixture lists in order to be profitable. With the availability of high-speed flights operating regularly, teams could now travel around the world for a single fixture. International sports tours became shorter and more frequent. Travel companies were quick to offer packages holidays to spectators who wished to watch their teams play in other countries.
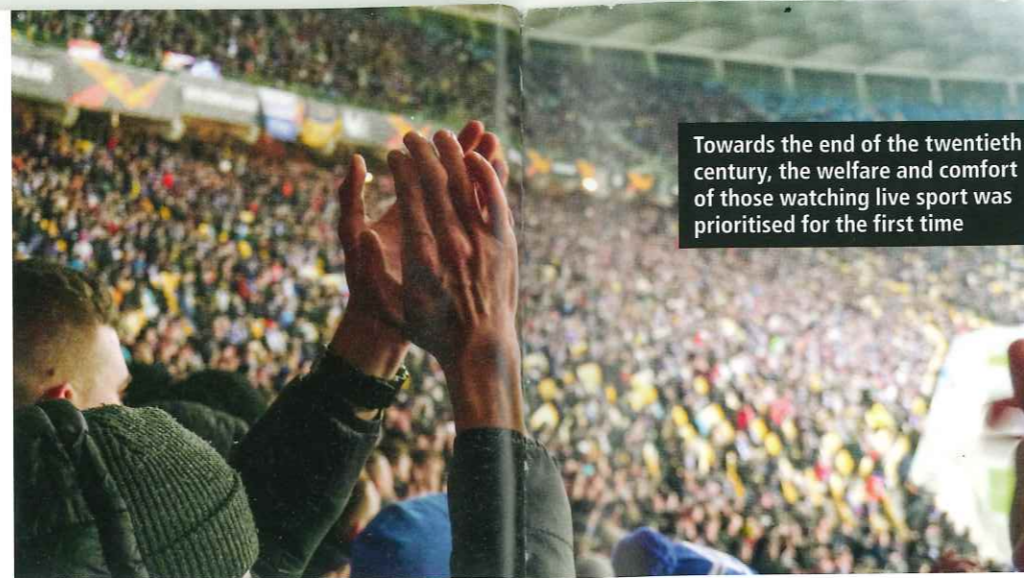
Sports teams benefitted from the expansion of the roads and the development of the motorway network, as travel times were reduced. Rugby union at the time was amateur and without a league structure. Clubs organised their own fixtures, and the success of a club was judged on the strength of its fixture list. Thanks to the development of the motorways, clubs such as Orrell RUFC were able to secure matches with high-level teams such as Gloucester, Llanelli and West of Scotland (Glasgow).

Previously, international games played in places such as Australia, South America and the Indian subcontinent could only be viewed retrospectively on film at the cinema, or received with erratic quality via radio. Air travel and diverse media outlets drew the world together, making overseas sport available to consumers. Increasing opportunities for performance at the highest level elevated standards of play while enriching the lives of millions.

Law and order

Governance and policing in Britain changed significantly in the second half of the twentieth century. The Sunday Observation Act had been in operation for 200 years and effectively banned public entertainment on Sunday, including both playing and watching sports.

The FA refused to allow play on Sunday until 1960. Three years later Sunday league football was expanded, leading to a substantial increase in amateur participation. By this time **Sabbatarian** sentiment was weakening and the demand for leisure pursuits was strengthening. Cricket and rugby league contrived to have fixtures on Sunday from the late 1960s, and football clubs exploited a loophole in the law by claiming that spectators were buying team sheets rather than paying entrance fees. However, it would be 1981 before the FA lifted the ban completely.

Betting shops were legalised in 1961, paving the way for a huge industry that continues to gather momentum in the twenty-first century.

Hooliganism and violence began to be a serious problem from the late 1960s. Police were deployed in large numbers at high-profile matches, often resembling military operations. Until the 1970s, sports crowds were expected to be self-regulating. Stewards were originally termed 'packers', with the job of squeezing as many people as possible onto the terraces.

Disasters caused by overcrowding at Ibrox (1975) and Hillsborough (1989) resulted in 150 fatalities. The subsequent Taylor Report put a new

Towards the end of the twentieth century, the welfare and comfort of those watching live sport was prioritised for the first time

focus on safety. All-seater stadiums became compulsory and the removal of fences surrounding pitches was required by law. Stewards now had to be trained. For the first time the welfare and comfort of those watching live sport was prioritised. The structure was established in preparation for the twenty-first century, when spectators were to become consumers in the sports industry.

Facilities and participation

In the austere 1950s, sporting facilities were sparse, restricting participation. Roger Bannister observed that 60% of the country's swimming baths had been built in Victorian times and there were only 11 athletics tracks. In contrast, West Germany built 47 pools immediately after the Second World War with plans for a further 200. Finland had 600 athletics tracks.

Sport at this time was the responsibility of governing bodies and thousands of volunteers who worked within many different frameworks. These disparate bodies lacked unified policies to increase participation or to develop excellence. The state was not involved in any capacity — it was believed that sport and politics should never mix.

This situation changed with the election of the Labour government in 1964. Prime Minister Harold Wilson appointed the first minister for sport. The appointment coincided with a period of change and prosperity. People were acquiring disposable income and had more time to enjoy increasing leisure opportunities.

The Sports Council was first set up as an advisory body, and eventually became involved in the distribution of finance. Construction of sports facilities became an immediate priority. Participation was encouraged by a Sports Council initiative known as 'Sport for All'. This targeted groups in society who traditionally opted out of activities after leaving schools, such as women and the working classes. Later emphasis was placed on including people with disabilities and people from minority ethnic groups.

Improvement or decline?

Participation did rise, particularly among the targeted groups. However, increases were registered in relation to indoor sports, and traditional outdoor sports experienced a gradual decline in numbers during the late twentieth century. Consequently, the mission to achieve mass participation has never been completely realised. Professor K. Jefferys of the University of Plymouth observed that there was never a 'golden era of participation' but the period between 1964 and 1979 was a time when community involvement in sport was a government priority.

From 1988, the Sports Council decided that programmes to develop Olympic excellence needed to take priority over the quest for higher participation. During the 1990s the Conservative government diverted large-scale lottery funding into the training of elite athletes. The former middle-class sporting ethos championed by amateurism had finally ended. British sport became professional and commercially dependent, with winning the overriding prerequisite.

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How mob games

Graham Curry shows how pre-industrial sports such as mob football and shinty led to modern sports such as tennis and hockey, looks at class differences in sporting activity and explains how to apply this knowledge in exams

Mob games — sometimes referred to as folk games — were relatively widespread in pre-industrial Britain. It was largely the lower classes who took part, and they represented rival villages or parts of a town. Mob games were occasional and played on feast days or holy days, such as Shrove Tuesday, Christmas Day and Easter Monday. Their irregular nature was due to the fact that the lower classes had little free time for leisure, working 6 days a week and using Sunday as a day of rest and religious worship.

It is incorrect to state that mob games had *no* rules. There were instructions on how to start and score, and there were forbidden areas such as churchyards. Murder was prohibited. Mob games were physically demanding and bordered on violence, and although injuries and accidental deaths did sometimes occur, they might be best described as exhibiting *controlled ferocity*. Some of the games are direct forerunners of the modern football forms now popular around the world, including association football (soccer), rugby union and league, and American football. Early forms of the modern game of hockey were usually referred to as **shinty** and originated in the Scottish Highlands.

Types and characteristics

There were four general types of mob/folk games:

led to modern sport

- Team games in which a player on foot or horseback attempted to propel a ball or similar object towards a goal or fixed point in order to register a score. These were the antecedents (predecessors) of football, hockey and polo.
- Individual games in which a player hit a ball into a hole or through hoops. These were the antecedents of golf and croquet.
- Team games in which a stationary person propelled a ball away from their person and scored by running between two fixed points. These were the antecedents of cricket and rounders.
- Ball games played against a wall or over a net. At their simplest these would involve striking the ball with the hand. These would be lower-class affairs and were the antecedents of all racquet games. At the same time, the upper-class game of real tennis was being played.

It is also possible to create a list of common characteristics held by these mob or folk games:
- informal organisation
- unwritten rules
- regional variations
- no fixed limit on territory or time
- played on natural terrain
- little or no role differentiation between players
- little distinction between players and spectators
- no outside agencies (referees) to enforce rules
- relatively high levels of violence
- emphasis on physical rather than skilful attributes
- contest of local meaning only

Mob football

Mob football games can be defined as loosely organised local contests between teams of often unequal size, which were traditionally played on public holidays. In medieval times a succession of British monarchs attempted to prohibit the games, partly because they created public disorder but also because they interfered with archery practice, which was required as an effective weapon in warfare. Table 1 shows a list of monarchs and other powerful individuals who prohibited forms of mob football.

Mob football was once a central part of popular culture in Britain, with games taking place in towns and villages from Cornwall to the Shetlands. During the nineteenth century most were banned completely but some were merely marginalised, effectively pushed to the edges of sporting society. Why did this happen?

The growing middle class saw these sporting activities as disruptive, violent and uncivilised. Participants often caused damage to property, and the events were regarded as unfitting for a society that was beginning to regard itself as beyond such low-status activities. Many of the games took place in the centre of towns, and shopkeepers and tradespeople — part of the middle class — were concerned about the disruption to business.

Table 1 Prohibitions of mob football

Year	Official	Place
1314	Lord Mayor of London, on behalf of Edward II	London
1331	Edward III	London
1389	Richard II	London
1401	Henry IV	London
1414	Henry V	London
1424	James I of Scotland	Perth
1457	James II of Scotland	Perth
1471	James III of Scotland	Perth
1474	Edward IV	London
1478	Lord Mayor of London	London
1491	James IV of Scotland	Perth
1496	Henry VII	London

Public nuisance?

The classic example of a thriving mob football game being banned completely is the one that was held in the city of Derby. The game took place on Shrove Tuesday between representatives of the parishes of St Peter and All Saints. It was particularly competitive, and has been suggested as the origin of the term 'derby' to denote a sporting encounter between local rivals. An inhabitant of the city wrote that:

> I know of nothing more detracting to the respectability of our town than the beastly and disgusting exhibition, absurdly called the 'Football play'...This relic of barbarism, for it deserves not a better name, is wholly inconsistent with the intelligence and the spirit of improvement which now characterise the people of Derby.

Passing through Derby in the early nineteenth century, a Frenchman witnessed the annual mob football game take place. He was incredulous at the intense nature of the action:

> If Englishmen called this playing, it would be impossible to say what they would call fighting.

Eventually, what was described in Derby as 'a public nuisance' was suppressed and by 1847 the game was eradicated, but only after special constables had been deployed and dragoons (mounted soldiers) had been summoned from Nottingham.

Surviving mob games

Several examples of mob games survive to the present day. The most significant is Royal Shrovetide football, still played at Ashbourne, Derbyshire on Shrove Tuesday and Ash Wednesday. In this case, the rival teams are called Up'ards and Down'ards depending on which side of the River Henmore, flowing through Ashbourne, they were born. The object

of the game is to score a 'goal' by striking the ball three times against millstones, both of which are now purpose-built, close to demolished mills that stand 3 miles apart. The playing area is only restricted by the fact that churchyards, cemeteries and civic or private gardens are out of bounds.

So why has the Ashbourne game been able to survive to the present day, when the Derby version was banned? A number of factors helped the game survive:

▦ A dedicated committee was formed.

▦ Patriotic songs are sung — the national anthem is played before the start of the game to give it a more respectable and nationalistic air.

▦ Celebrities are invited to start the game.

▦ Ashbourne is geographically isolated.

▦ Much of Ashbourne's game takes place in the countryside rather than built-up areas.

Upper-class sports

Aristocrats and the upper classes took part in different sporting activities. Because they had a great deal of time at their disposal, they were able to enjoy sports that required many hours of involvement. These included country pursuits such as shooting and hunting. Fox hunting was only banned in 2004 — the activity probably lasted longer than comparable lower-class pursuits because of the involvement of upper-class people with considerable social prestige and power.

Real tennis

Real tennis was played by royalty, aristocrats and the upper classes in medieval times on expensive courts in the palaces of the wealthy. It was far more sophisticated than mob football, with a complex set of rules. The lower strata of society were excluded on the basis of social class, wealth, access to facilities and lack of free time. The game was an elitist sport but should still be seen as a predecessor of the modern version of tennis.

Just as the mob form of football remains in places such as Ashbourne, so real tennis is still played to world championship level. Like mob activities, it has been marginalised, though has not died out altogether. Although such sports have been overtaken by other forms of the game, certain groups have maintained interest in them, often because of their historic value.

King Henry VIII was an enthusiastic real-tennis player. His court — constructed in 1530 at Hampton Court Palace on the River Thames in London — still stands today. These early purpose-built facilities were an indicator of the spending power of the aristocracy.

Early modern sports

Cricket, boxing and horse racing were developed and codified well before 1800, which marks the real onset of the western European civilising process. We can set them apart from other sports because they have largely retained their form of play from the days before the Industrial Revolution until today. A game of cricket in 1800 would be recognisable as a predecessor of the modern form — the same could not be said of football.

The 2017 Ashbourne Shrovetide football match

Mob games were prohibited partly because they created public disorder but also because they interfered with archery practice

The first cricket club was formed at Hambledon in Hampshire. However, its primary purpose was not really to play cricket, rather the participants consumed large amounts of alcohol and wagered heavily on the outcome. The game was generally dominated by the upper classes, who provided most of the batsmen while the lower classes toiled as bowlers. This mixing of classes was common in cricket, though the lower class were kept in their place by being forced to enter the field through a different entrance and being referred to on the scorecards by their surnames only.

Boxing also saw a mixing of the classes, where the lower classes fought and the upper classes acted as patrons or sponsors for the fighters, while wagering heavily on the outcome. Fighters were regarded as little better than racehorses in the way that they were 'owned' and 'employed' by their upper-class patrons.

Horse racing is known as the 'sport of kings' due to its links with the upper classes. 'The greatest flat race in the world', the Epsom Derby, was first run in 1780 and, apart from several years during the Second World War and the late 1940s, the race was always run in midweek, only changing to Saturday in 1995. The Grand National was traditionally run on Friday and only changed to Saturday in 1947. The Cheltenham Festival still takes place from Tuesday to Friday. This policy was, and possibly still is, a deliberate attempt to exclude working-class spectators, as it would be expected that the vast majority would be engaged in employment during midweek. In terms of spectators, the aristocratic controllers of horse racing were employing their own class exclusion clause in preventing the lower classes from attending prestigious race meetings.

In exams

Understanding the role that social class plays is probably the most important part of the sport and society sections of the various PE courses. Try to note which kinds of activity were played by which parts of society, and be able to give examples. The easiest are the two sports that form the central part of this article: mob football and real tennis. Use the former as an example of participation by the lower classes and the latter as an illustration of aristocratic and upper-class involvement.

Try to weave in other aspects, such as the time available for each class and the reasons for this. The lower classes had little time on their hands in which to participate in sport — in pre-industrial Britain they would spend the hours of daylight working in the fields. If they migrated to urban environments in search of work in factories for increased monetary rewards, they would have been committed to 12-hour working days. Sunday was a day of rest and worship, which left only holy days ('holidays') when they could participate in their favoured activities.

By contrast, the upper classes had plenty of time available and enormous spending power. Post-industrial Britain saw the introduction of extended free time in the form of Saturday afternoons off. Rational recreation was replacing the popular forms and the lower classes were able to be regularly involved in sport.

Graham Curry is an author and PE teacher.

A history of sport in public schools

From gentry hooligans to gentleman amateurs

Eton College

In the early part of the nineteenth century, sport and games were of little interest to the headmasters of the leading public schools. Involvement by teachers was sparing. They might intervene when necessary to prevent isolated incidents of violence and brutality between boys. Or to halt the actions of boys rampaging around neighbouring land and engaging in various *field sports* such as poaching and fishing, which caused tension with locals. This kind of physical activity has been recognised as stage one in the development of sport at public schools (1790–1824), sometimes known as the era of the *gentry hooligans*.

Social control

As the century progressed there was a growing acceptance among the new generation of educators of the value in games and the characteristics that involvement in them could help develop. The **Clarendon Commission** commended the leading public schools for 'their love of healthy sports and exercise' (Mangan 1992). It was felt that games taught Englishmen 'to govern others and to control themselves'.

Such leadership skills were what Thomas Arnold, head of Rugby School from 1828 to 1841, identified as fundamental to the development of discipline and morality among gentlemen. These qualities were fostered through the prefect system (Holt 1989). This second stage of the development of sport in public schools has become known as *Arnold and social control*.

The emergence of sport as part of the formal school provision in public schools was rapid. By the middle of the century, games had been formally embraced by headmasters, to such an extent that masters were employed purely for their sporting ability. Within the space of 20 years, schools had gone from occasional 'hare and hounds' runs to **inter-house matches** and full sports meetings. In 1845 Eton's annual steeplechase

> ### KEY TERM
>
> **Clarendon Commission (1861–64)** A royal commission set up to investigate the state of nine leading schools in England following complaints about the finances, buildings and management of Eton College.

> ### KEY TERM
>
> **Inter-house matches** The first form of regular competitive fixtures for public schoolboys. These events were organised and supervised by the senior boys (prefects) to both develop leadership skills and keep the younger boys under control.
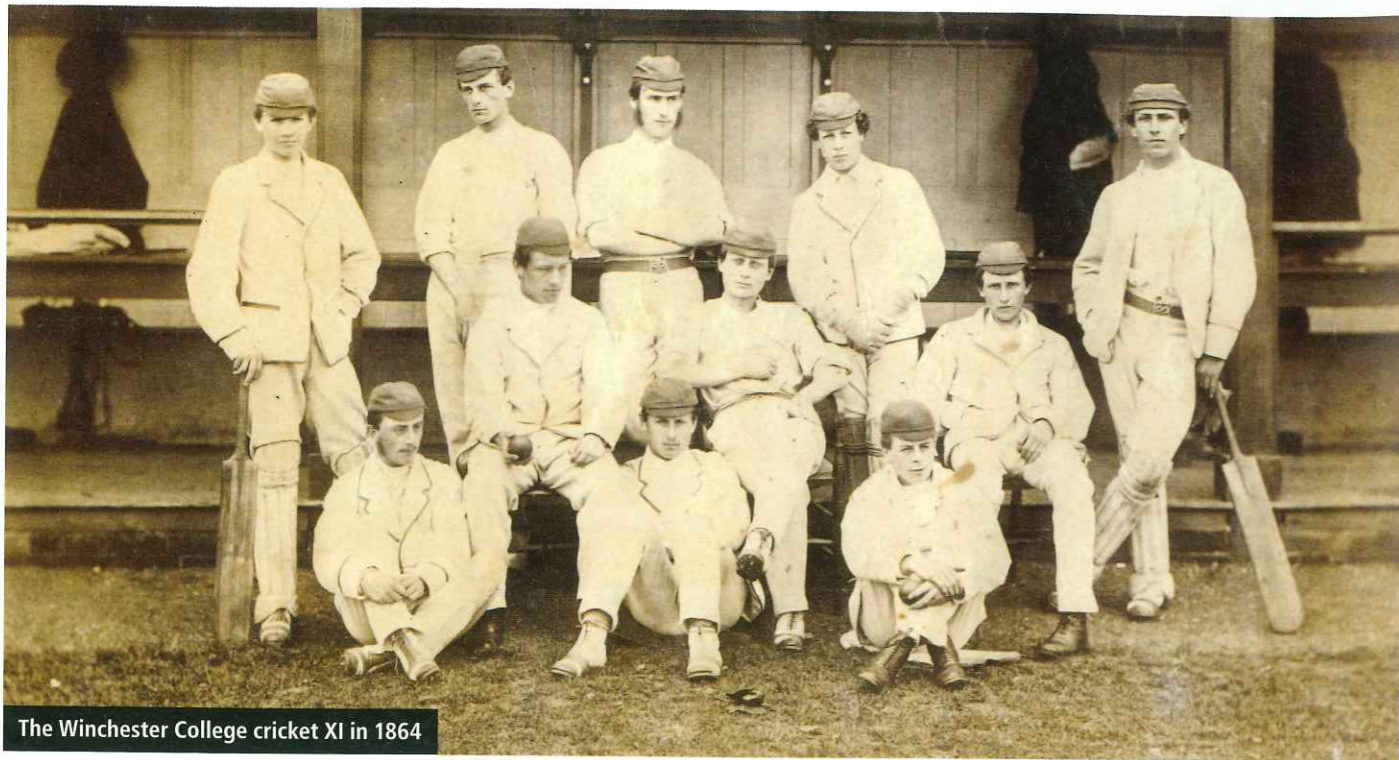
The Winchester College cricket XI in 1864

commenced, followed by those at Cheltenham and Harrow in 1853, Rugby in 1856 and Winchester in 1857 (Harvey 2005).

Courage and endurance were essential physical traits that could be developed through games. Football actively promoted such virtues. Through more formal instruction, a process of civilisation took place, whereby the scrum or its idiosyncratic derivatives (such as the 'hot' at Winchester) became an institution of the public schools.

Brutal football

The first record of football being played at Winchester was in 1825, with 25 players on each side. Goals

were 27 yards apart, and were simply a line cut in the earth, there being no cross bar (though no goal could be kicked above 5 yards high). The game was extremely physical and, as dribbling was forbidden, one of the main objectives of the game was to charge down the opponents' shots, which would have been a painful business.

According to Holt (1989), football at Winchester was known to be particularly violent, with boys regularly taken to hospital with broken bones. Such ailments didn't seem to deter their fellow squad-mates, who waited to take the place of the injured (Holt 1989). The sheer physical pain of playing meant that the Winchester football game was not adopted by universities, but nonetheless it was probably the model for the field game introduced at Eton.

Football at the various public schools remained insular, with each school having its own form of the game, typified by often unique and peculiar **local rules**. Such games did not lend themselves to contact with external teams or other schools. While it would be false to suggest

that footballers at these schools remained distanced from outsiders, little interaction actually occurred (Harvey 2005).

Contact and codification

This situation slowly began to change towards the middle of the nineteenth century, as more open-minded headmasters saw the need to challenge the blinkered elitism of only playing among themselves. There was still a division of sorts, as until the 1840s Harrow only recognised Eton, Winchester, Westminster and Charterhouse as public schools. While there is no evidence of snobbery affecting the interactions between public schools on the football field, it was likely a factor in determining the selection of suitable opponents (Harvey 2005).

Contact between public schools on the football field appears to have

been first suggested in 1827, when Winchester challenged Eton to a match on Egham racecourse. Eton rejected the challenge because Winchester stipulated that both sides should 'dress in high gaiters and mud boots'.

For several years the various institutions played each other by sharing the rules of their respective versions of football and playing one half with one set of rules and then swapping for the second half. The real catalyst for a more frequent programme of inter-school fixtures was the formalisation of a **codified** set of rules. Representatives from the major public schools met at the University of Cambridge in 1848 with the aim of standardising the games played between them. The *Cambridge Rules* were duly created and formed the code adopted by the football teams of Eton, Harrow, Rugby, Shrewsbury and Winchester. This also ensured that when students arrived at Cambridge, they all knew the rules.

The gentleman amateur

Sports such as cricket, rowing, tennis and athletics were also essential components of school sports programmes during the nineteenth century. The driving philosophy behind the promotion of these sports was the fact that they were seen as a vehicle for instilling values such as camaraderie and cooperation. Alongside these virtues was the emphasis on creating the archetypal *gentleman amateur* who played sport not only to the written rules but also to the nobler concept of the spirit of the game.

The ideal of the gentleman amateur was someone who could play several games extremely well without giving the impression of strain or the need to indulge in additional physical training. This ideal has been greatly romanticised over the years. For such an individual to be adept at playing so many games so well, he undoubtedly needed to belong to the wealthy upper classes.

RESOURCES

Harvey, A. (2005) *Football: The First Hundred Years: the Untold Story*, Routledge.

Holt, R. (1989) *Sport and the British: A Modern History*, Oxford University Press.

Johnson, B. **www.historic-uk.com/CultureUK/Association-Football-or-Soccer**

Mangan, J. (ed.) (1992) *The Cultural Bond: Sport, Empire, Society*, Frank Cass.

Sporting prowess across several disciplines became the mark of the public schoolboy, and the sporting all-rounder who displayed this combination of athletic vigour and true sportsmanship (i.e. **athleticism**) became a sought-after figure for diplomatic and civil service roles across the British Empire. According to Holt, the Sudanese political service recruited entrants from 1899 through an interview process primarily based upon recommendations from trusted dons at the Universities of Oxford and Cambridge. Of 393 entrants to the administrative grade, 71 had full representative sporting honours from Oxford or Cambridge, and many more were highly proficient sportsmen drawn from the older established public schools (Eton, Rugby, Winchester and Marlborough).

Skills and characteristics

It wasn't until the mid-to-late nineteenth century that sporting opportunities for upper- and middle-class girls emerged. A mixture of pseudo-scientific beliefs combined with stereotypical views of women's role in society acted as significant barriers to education and physical activity.

The traditional programme of inter-school sports fixtures has been

a feature of English public schools for well over 150 years. Although the late spring and summer of 2020 saw an abrupt termination of these fixtures due to COVID-19, we shouldn't forget the history behind sport in the public schools and how it remains such a prominent part of school life. The skills and attributes developed through sport are still fundamental reasons behind the ongoing extra-curricular programmes within public schools in the twenty-first century. Characteristics such as leadership, discipline, teamwork, cooperation, resilience and determination are as highly valued now by employers as they were in the nineteenth century, and so sport's prominent role within public schools continues.

Mark Burley is the director of sport at Winchester College.

Simone Biles on
the parallel bars
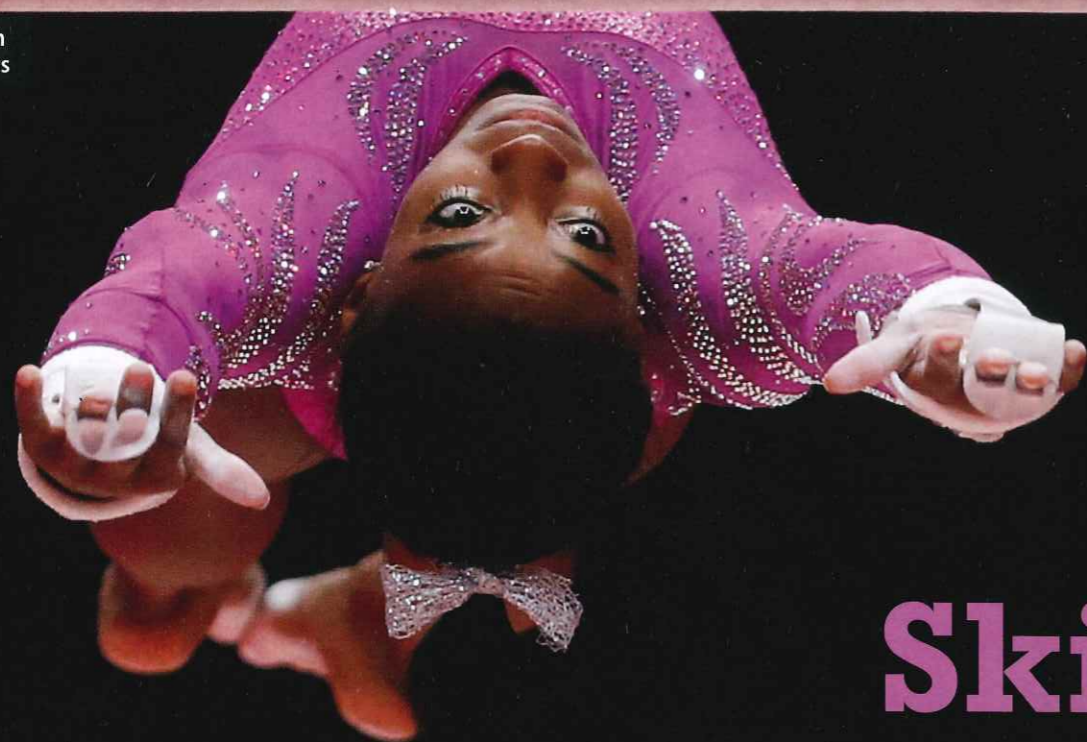
Skill acquisition

John Ireland takes you through the stages and models of learning

What are the stages or phases through which top-flight sports performers progress while learning and developing motor skills? To answer this question, we must look at the types of feedback used by coaches and utilised by participants at each stage. We should also examine the methods of guidance that best facilitate skill acquisition during progressive phases. Table 1 shows the progressive phases of learning and acquired competence, and Table 2 shows the types of **feedback**.

Before discussing stages of learning and the processes that facilitate progression, it is useful to highlight the factors that influence skill acquisition and performance.

KEY TERM

Feedback Information received by the performer during or after skill execution.

Learning components

Learning is complex. It involves much more than assimilating facts. By the same token, the acquiring of motor skills is not a simple procedure that merely entails mastery of separate techniques. A technique itself is not a skill, it is one element of performance. Only when a technique is applied during a response in sport can it be classified as a skill.

The capacity to learn and perform is determined by the interaction of three broad components (Figure 1):
- affective
- cognitive
- psycho-motor

Affective

The affective component is qualitative and bound by emotions. It concerns the approach taken to learning and involves, for example, motivation, ambition, confidence and persistency.

Some learners adopt approach behaviour that is accepting of challenges. This behaviour is associated with a 'need to succeed' attitude. Such positive drive is termed **mastery orientation**. Learners with these personality characteristics tend to be confident and motivated. They are more likely to progress to the autonomous phase of acquisition (see pp. 22–25).

Other learners assume avoidance behaviour, rejecting challenges. This is linked to a 'need to avoid failure' inclination. This negative attitude is synonymous with **learned helplessness**. It is likely that these

Table 1 Stages of learning

Learning stage	Description
1 Cognitive stage	Period of thought, initial understanding and first physical engagement in relation to new skills.
2 Associative stage	Practice and improvement phase.
3 Autonomous stage	Mastery and full competence. Stage of expertise.

Table 2 Feedback

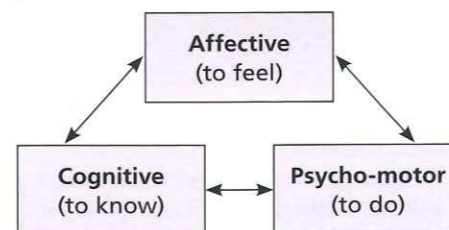| Type of feedback	Description
Positive	Information given or received when movement is correct.
Negative	Information given or received when movement is incorrect.
Intrinsic	The feel of the movement experienced by the athlete during performance.
Extrinsic	Advice conveyed to performers by the coach.
Knowledge of results	Data gathered by the performer regarding the movement outcome.
Knowledge of performance	Intelligence gathered and understood by the performer regarding the feel and quality of movement during performance.

Figure 1 Learning components

learners will give up before leaving the cognitive phase.

Cognitive

Cognitive variables involve intellect, perception and memory. For some, the understanding of key points is easily attained. Such people learn quickly and are most able to apply knowledge to solve problems in sporting situations. Other people may learn more slowly, needing to work persistently hard during practice to develop understanding.

Psycho-motor

Psycho-motor parameters incorporate mind and movement of body and limbs. Some learners appear to move naturally, achieving progress quickly. They readily acquire the **flow** of skill. Such grace of movement is a hallmark of elite performance. Rapid progress may occur because the learner has high **ability** levels.

See Box 1 for a real-world example of these theories in action.

Learning and transfer

Learning is reflected by a permanent change in performance. Modification of behaviour is apparent during each progressive learning phase.

An indication of permanence is when skill execution becomes

KEY TERMS

Mastery orientation The desire to learn a skill to the highest degree of competence. It relates to high confidence levels.

Learned helplessness The feeling that failure is inevitable and that no control is accessible regarding this outcome. It relates to low confidence levels. This condition will prevent accession to the autonomous phase.

KEY TERMS

Flow Refers to fluency and smoothness of execution. This is a necessity of high-level performance and depends upon developing the feel of the skill (kinaesthesis).

Ability Abilities are innate and therefore natural. They are not skills, but underpin motor skills and the potential to learn.

Stable Factors that have unchangeable characteristics.

Non-cerebral Not requiring thought.

Transfer A process through which one set of skills and experiences influences the learning and performance of other skills. It helps an athlete to adapt previous learning when responding to new situations.

Cognitive application The involvement of thought and brain function.

Box I Pip Hare

In February 2021, Pip Hare became the first British skipper to complete the Vendée Globe non-stop solo round-the-world boat race. Over 95 days, she navigated and piloted her vessel through rough seas and challenging weather.

All three components of learning and performance are exemplified in Hare's skills and achievement, most notably a strong desire to succeed and considerable mental toughness.

stable and consistent. Skill cannot be a transient response brought about by **non-cerebral** changes such as improvements in fitness levels or increases in body weight. Such physical variables are not associated with learning (Sharp 1992). Furthermore, skilful actions do not occur by chance or accident. They are derived through learning, the process of **transfer** and a directive of **cognitive application**.

> A skilful action is performed by way of conscious thought producing an intended outcome.
>
> Robb

Therefore, learning transpires through practice, memory storage and transfer of experiences obtained during training and from competitive performance. The process of transfer is crucial to the acquisition of skill and is significant during each progressive stage of learning. Thorndyke endorses the importance of transfer by asserting that:

> Practically all learning is based on some form of transfer.

New skills inevitably arise out of previous experiences (Sharp) and it appears that transfer is a facilitator of learning even for the very young at the rudimentary cognitive phase of development.

> Totally new skills are rarely learned entirely from scratch after the early years of childhood.
>
> Schmidt

According to psychologists Fitts and Posner (1973), it is of utmost significance that the notion of skill transfer is remarkably persistent and continues into the final phase of learning.

Skill classifications

Sports skills are diverse and numerous. Consequently, they are grouped according to type into categories, known as *classifications*. Awareness of classification is important. Groupings indicate the type of practice that will best facilitate the learning of a given skill.

Open skills

Open skills are performed in sporting environments that are constantly changing, such as those experienced during invasion games, e.g. passing the ball in rugby. It follows that open skills are perceptual, meaning the player needs to interpret or make sense of **environmental cues**.

Accurate perception is essential, steering the process of decision making and movement adaptation which is central in this category of skill. Open skills are externally paced because the proximity and tenacity of defenders prompt the timing of the pass.

Open skills are learned most successfully by engagement in varied practice. Practice conditions can replicate the game environment, therefore maximising opportunities for decision-making and movement adaptation.

During performance of open skills, previous learning needs to be transferred and adapted to facilitate performance that is unique and sometimes remarkable. See Box 2 for a real-world example.

Closed skills

Closed skills are executed in unchanging environments. For example, artistic gymnastic routines require constancy and are pre-determined. Consequently, these skills are habitual. This means that the movement pattern required for execution does not require adaptation and remains the same each time the skill is performed. Reduced need for decision-making limits the requirement for perception.

Closed skills are self- or internally paced, meaning the athlete decides when performance begins. These skills

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KEY TERMS

Environmental cues Signals, signs or data arising in the sporting environment that prompt or trigger a response.

Efficiency Refers to the movement of an elite athlete as being economic in terms of time and effort.

Instinct A reaction occurring with minimal conscious thought.

Intuition An insight formed by perception, experience and conscious thought.

Insight The capacity to comprehend and understand. It is a major variable of cognitive learning theory and Gestalt patterning.

Grooved or **overlearned** Refers to the condition of a motor programme that has been so thoroughly learned that it is permanently stored in long-term memory and recalled easily as a rigid and specific unit.

---

require fixed practice that directly reflects actual performance conditions. The nature of this application is repetitive, causing the skill (motor programme) to become **overlearned** and **grooved** into long-term memory.

Closed skills, although pre-determined, can also be magnificent (Box 3).

Assembling skills

Fitts and Posner used the language of computing to illustrate how motor skills are assembled. The overall skill is regarded as an *executive motor programme (EMP)*, underpinned by a series of mini skills referred to as *subroutines*. Assembly is therefore based on a hierarchically arranged model, as shown in Figure 2.

Low organisation

Throwing skills like javelin, discus and shot put have the same subroutines, which occur sequentially (in order). Therefore the skills that support subroutines can be isolated and practised separately, e.g. via part or progressive-part practice. Skills in these throwing events are categorised as *low organisation*.

High organisation

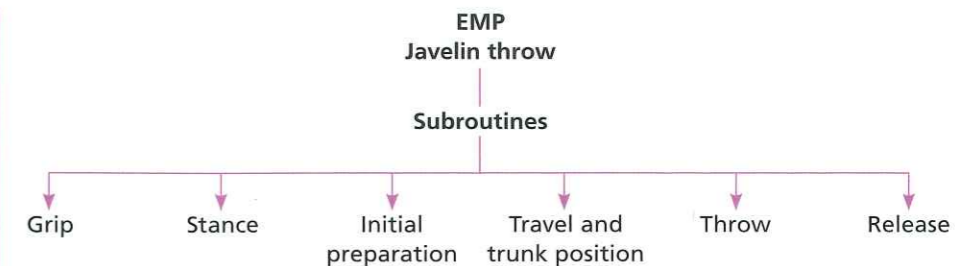Skills like track sprinting, rowing and basketball dribbling comprise subroutines actioned simultaneously,

---

Figure 2 An executive motor programme (EMP) with subroutines

KEY TERM

Motor programme A skill-related pattern of movement.

which cannot be practised as individual units. Such skills require whole practice methods.

Skills in these examples are classified as *high organisation*. The example used in Figure 3 conveys that at the cognitive stage of learning, control of the basketball demands great attention to rudimentary detail. As progress to the autonomous phase occurs, the attentional focus of the performer changes considerably.

Models and memory

Multi-store memory model

The permanence of learning as a stored experience is accounted for by the *multi-store memory model* (Atkinson and Shiffrin 1968, see Figure 4). This structural approach explains how skills are retained, reproduced and adapted when required. The 'workspace' in this model is short-term memory (STM).

STM's first function is to filter out all but the most relevant stimuli from the environmental display, which is registered in the short-term sensory store (STSS). This process is termed *selective attention*. Only relevant information is encoded into the 'workspace'. STM can only store up to nine sensory cues for a brief
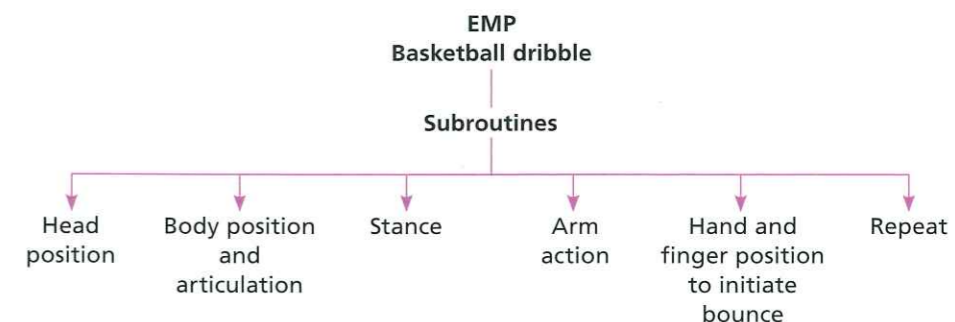
duration (30 seconds). At this point, information held here is fragile and easily lost.

For retention to occur and learning to come about, a process termed *maintenance rehearsal* ensues to consolidate knowledge. This procedure involves repetition and practice, helping to form a **motor programme**, which in an overlearned state becomes grooved in long-term memory (LTM).

When a specific circumstance arises in a game, the STM triggers the retrieval of an appropriate motor programme from the LTM and initiates the physical response, e.g. the kick and catch for Darcy Graham's try.

Criticisms

A criticism directed at the multi-store theory is its apparent inability to account for improvised responses produced by top-level performers. Sceptics claim that the appropriate motor programme would not exist to enable improvisation, because an isolated and unique situation cannot be rehearsed.
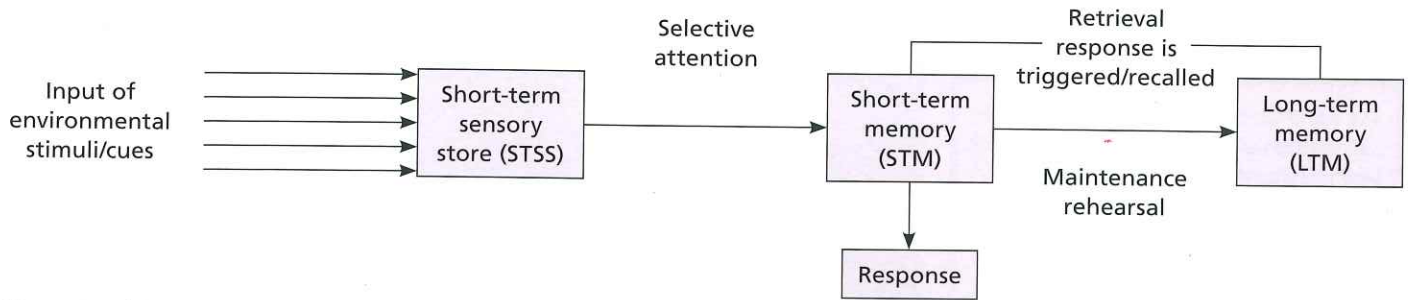
Figure 3 Dribbling a basketball is a high-organisation skill

Figure 4 Atkinson and Shiffrin's multi-store memory model

Furthermore, if a specific movement plan was in place to address every solitary circumstance arising in sport, countless motor programmes would need to be retained. This is implausible. If LTM could store an infinite number of programmes, rapid recall would be unfeasible. Such incredulity fuels the inexact belief that exclusive, 'one off' exhibitions of skill are instinctive, and autonomous athletes are naturally talented.

Levels of processing model

An explanation of how a creative movement can occur is attributed to the existence of three related components, which allow information to be retained in an adaptable form. Therefore motor programmes are not stored as rigid, separate units, but as abstractions or schema. The expansion of **schema** allows the sports performer to store generalised patterns of movement, making creative improvisation in open-skill situations possible. Open skills therefore require conditions of varied practice.

Craik and Lockhart (1972) took this research further, proposing the *levels of processing model* (Figure 5). Their theory does not distinguish between STM and LTM. Also, unlike the multi-store model, it has no set structure. By contrast, major focus is given to the levels at which information is processed. This is the critical consideration influencing the retention of skills and experiences.

Levels of processing theory asserts that maintenance rehearsal, undertaken through repetitive practice, is not the best way to establish retention. Repetition needs to be augmented by more sophisticated processes before the effectiveness of memory is improved. These range from shallow processing (maintenance

rehearsal) to a deeper **semantic** analysis, termed *elaborative rehearsal*.

Elaborative rehearsal consists of making an association between the new information which is to be learned and the information already known. In addition, it gives meaning to actions and experiences, which allows memory of them to be more easily accessed.

Distinctiveness is the third factor involved in the deeper operation of semantic memory. Distinctiveness gives a performer the capacity to separate items of information and recognise them independently. However, elaborate rehearsal has overriding importance in memory retention.

For further exploration of skill acquisition, see the poster on pp. 16–17 and the 'Exam focus' on pp. 22–25.

> ### KEY TERMS
>
> **Schema** An adaptable and comprehensive store of experiences.
>
> **Semantic memory** A part of LTM that stores knowledge, gives meaning to experiences and helps in problem-solving.

> ### KEY POINTS
>
> ■ Learning can be monitored through three ascending phases (cognitive, associative, autonomous).
> ■ Feedback supports learning. The type and suitability of guidance changes during the progression of learning phases.
> ■ Capacity to learn is determined by three interacting components (affective, cognitive, psycho-motor).
> ■ Skill classifications indicate the most appropriate practice type.
> ■ Memory is central to learning, as it stores and retrieves information. Learning is reflected in a permanent change in behaviour, and it continues during the autonomous stage.
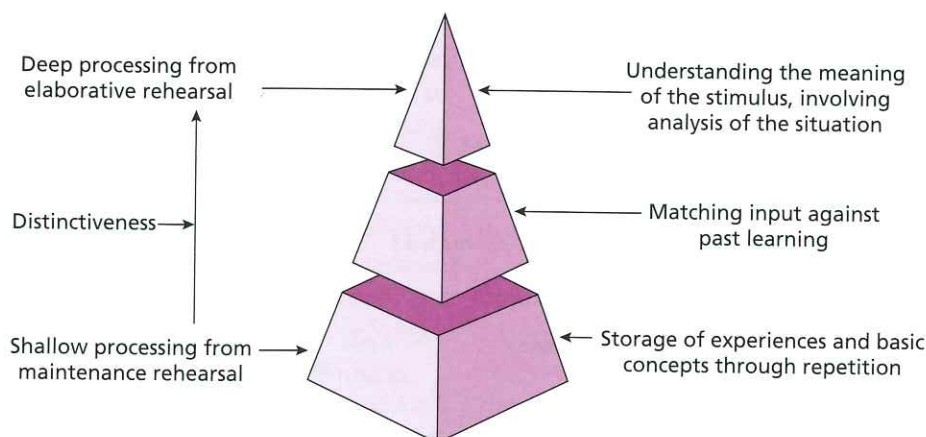

Figure 5 Craik and Lockhart's levels of processing model

John Ireland is an experienced teacher and an author of A-level PE teaching and learning resources.

Cardiovascular response to exercise

Key notes and practice questions

Mike Murray provides a summary of this important exam topic, with practice questions to aid your revision

When we exercise, our heart rate increases to supply more blood and hence oxygen to our muscles. This regulation of heart rate is brought about by the body detecting an increase in blood acidity (lower blood pH). The increased acidity is mainly due to increasing amounts of carbon dioxide being produced during exercise.

Increasing levels of acidity in the blood are detected by chemoreceptors. The chemoreceptors send nerve impulses to the cardiac centre in the medulla of the brain, which in turn sends fewer nerve impulses along the vagus (parasympathetic) nerve and more impulses along the sympathetic nerve to the sino-atrial node (SAN) in the heart, which increases the heart rate.

Practice exam question

(1) During a game, a player's work rate will vary. Describe how the parasympathetic and the sympathetic nerve pathways control heart rate during a game. (4 marks)

Key terms ⬇

Cardiac output The amount of blood leaving one ventricle in 1 minute.
Ejection fraction The proportion of the blood in one ventricle that leaves the heart.
Stroke volume The amount of blood leaving one ventricle per beat.

Adrenaline

During times of stress, the hormone adrenaline is released. Adrenaline increases the heart rate and the amount of blood expelled during each contraction (**stroke volume**) of the heart. This stress reaction invariably occurs when we anticipate and/or prepare for exercise.

When we exercise, both our heart rate and stroke volume increase, resulting in an increase in **cardiac output**. The increase in stroke volume when exercising is mainly due to the elastic nature of cardiac muscle.

During exercise, blood flows faster and more is returned to the heart; there is an increase in the venous return. When this blood enters the ventricles

during diastole, the walls of the ventricle stretch and contract more forcefully, thus increasing the **ejection fraction**. This demonstrates **Starling's law of the heart** (Box 1).

Practice exam question

(2) Both heart rate and stroke volume increase when running.
Use Starling's law of the heart to explain how stroke volume increases when running.
(3 marks)

Effects of sweating

When exercise continues for a long period, the stroke volume begins to decrease while the heart rate increases. There is also a slight increase in cardiac output.

These changes to cardiac function are called the **cardiovascular drift** (Box 2) and are caused by sweating. Sweating means a loss of fluid. The fluid comes from the blood, decreasing the blood volume and therefore the venous return. A reduction in venous return means a

Box 1 Starling's law of the heart

During exercise:
- increased venous return
- increased diastolic filling
- cardiac muscle stretches
- increases elastic recoil
- ejection fraction increases

Box 2 Cardiovascular drift

Features of long duration exercise:
- sweating
- blood volume decreases
- reduced venous return
- reduced stroke volume
- increased heart rate to maintain cardiac output
- slight increase in cardiac output due to sweating

Box 3 Vascular shunt mechanism

During exercise:
- sympathetic nerves send impulses to muscles
- vasodilation in arterioles leading to muscles/skin (pre-capillary sphincters dilate)
- vasoconstriction in arterioles leading to kidneys, liver etc. (pre-capillary sphincters contract)
- no change to brain supply as the brain needs oxygen to maintain it's function

reduction in stroke volume (as shown by Starling's law) and so because stroke volume declines, heart rate must increase to maintain cardiac output.

The slight increase in cardiac output that occurs during prolonged exercise is also due to sweating and the increased amount of oxygen needed to supply energy to assist the production of sweat in order to cool the body.

Making blood available to muscles

Arteries and arterioles take blood away from the heart to beds of finely branching capillaries. There are so many capillaries in the body that they cannot all be supplied with blood at the same time. There is competition for blood between different regions of the body, especially during exercise, when blood must be shunted to the working muscles, and consequently withdrawn from other regions.

During exercise the working muscles need extra oxygen, so more of the cardiac output must be directed to the muscles.

The blood supply to the skin also increases during exercise to lower the body temperature. The blood supply to other organs decreases, except to the brain, where the blood supply is maintained. This process of redistributing cardiac output is called the **vascular shunt mechanism** (Box 3).

Small arteries (arterioles) have rings of circular muscle in them that act as sphincters. When contracted, these pre-capillary sphincters reduce the blood supply to that particular capillary bed. When the sphincters relax (vasodilation), blood flow increases into the capillary beds.

This blood shunting is controlled by the sympathetic nervous system. Nerve impulses from this system cause the smooth muscle in arterioles and the pre-capillary sphincters to contract, and vasoconstriction occurs. In cardiac and skeletal muscle however, these same sympathetic nerves are vasodilators, increasing the diameter of the blood vessels supplying these tissues.

Practice exam question

(3) Identify and give reasons for the differences in blood flow to the skeletal muscles and skin during maximal exercise compared with at rest. (4 marks)

There are also local factors that have a direct effect on vasodilation in working muscles. These include a rise in carbon dioxide levels, which causes an increase in acidity. These changes to the blood are detected by chemoreceptors, and lead to sympathetic stimulation via the vaso-motor centre in the medulla.

Effects of training

Box 4 on p. 12 gives a list of the effects of training. Months of training, especially endurance training, lead to an increase in the size of the heart, mainly due to an increase in the thickness of the cardiac muscle of the left ventricle. Cardiac muscle, like skeletal muscle, gets bigger

Box 4 Effects of training

- Cardiac hypertrophy
- Increased stroke volume
- Same cardiac output
- Reduced heart rate
- Resting = bradycardia
- Exercising = more blood/oxygen available to muscles

the more it is overloaded. It undergoes hypertrophy (also called 'athlete's heart').

In power-trained athletes, the hypertrophy is less pronounced and is caused by both an increased thickness of the ventricular cardiac muscle and an increase in the size of the ventricular chamber.

The hypertrophied heart fills more during diastole (pre-load) and has increased strength of contractions during systole, resulting in an increased stroke volume.

Training also reduces resting heart rate. A resting heart rate below 60 beats per minute is known as **bradycardia**.

Adrenaline is released and heart rate increases during exercise

Training has little effect on resting cardiac output, but:

$$\text{cardiac output} = \text{stroke volume} \times \text{heart rate}$$

so an increased stroke volume through training will result in a decreased resting and exercising heart rate.

The main benefit of training to the performer is that the exercising heart rate is reduced and less oxygen is needed when exercising. This means that more oxygen is available for the working muscles to use to produce energy.

Practice exam question

(4) Years of training will eventually result in football players having a lower resting heart rate.
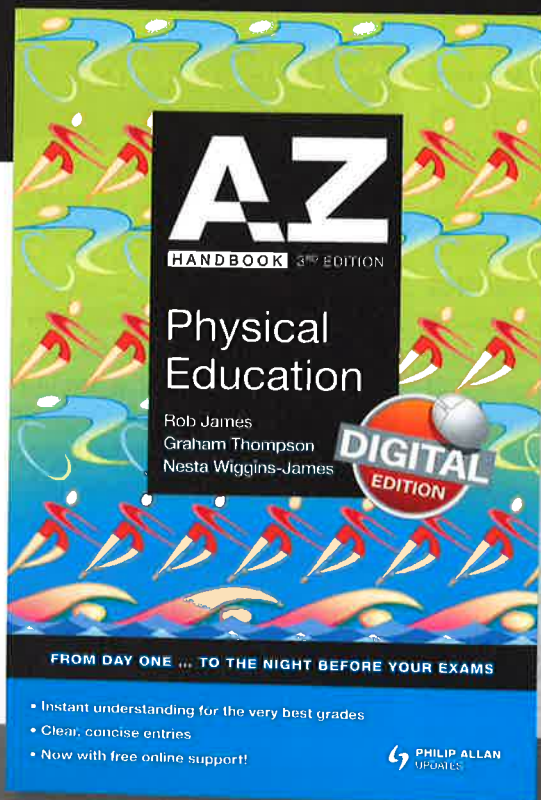(a) What term is used when resting heart rate is below 60 beats per minute? (1 mark)
(b) How does a lower resting heart rate affect oxygen delivery to muscles? (2 marks)

PEReviewOnline

See PEReview Online **for answers to the exam questions.**

Mike Murray is principal examiner of a major exam board and author of a number of teaching resources.

Food for thought

The pre-competition meal

Sue Young looks at what you should and shouldn't eat before a competition

Taking part in any physical activity requires energy

In order to achieve optimal performance in sport, it is essential to be well fuelled and well hydrated. Taking part in physical activity means the body needs energy. The amount needed depends on the duration and type of activity. For example, an elite footballer playing in the Premier League will need more energy than a footballer playing in a Sunday afternoon pub football match.

Energy is measured in calories and is obtained from stores in the body or from the food we eat. Glycogen is the main energy source used by the muscles and can be used for both aerobic and anaerobic exercise. Competing with low glycogen stores will make you feel tired and your performance will not reach its full potential.

Many competitors ask the following questions:

- What should I eat before competition?
- When is the best time for me to eat?
- How much food should I eat?
- How much fluid should I drink?

When answering these questions it is important to realise that not one pre-competition meal is right for every performer in every activity, but some food choices are better than others. There are certain guidelines that you need to follow and this article aims to help you make the right choices.

What should I eat before competition?

Your pre-competition meal needs to ward off any feelings of hunger, as this can become both a mental and physical distraction while performing. It should also maximise carbohydrate stores in the muscles and liver and top up blood glucose stores. This means you need to eat foods high in carbohydrate and

Table 1 Examples of low-GI foods

All Bran	43
Apple	37
Apricot (dried)	30
Baked beans (tinned)	46
Banana (unripe)	30
Grapefruit	25
Kidney beans	28
Milk (skimmed)	32
Porridge	46
Spaghetti (wholemeal)	39
Strawberry	32
Yoghurt (low fat, sweetened)	33

low in fat, protein and fibre. Protein, fat and fibre are more difficult and slower to digest than carbohydrate and remain in the stomach for a long time.

When considering what carbohydrates you need to eat it is important to look at their glycaemic index (GI index). This is a scale of how much a certain type of food raises the level of blood sugar in comparison to pure glucose. Carbohydrate-rich foods with a GI greater than 70 are considered to be high-GI foods, while those with a GI of less than 55 are considered to be low-GI foods (Table 1). Foods that fall between these two values are considered to be moderate- or intermediate-GI foods.

Most sports nutritionists advise you to eat complex carbohydrates with a low GI index. Such foods include:

- brown rice
- wholemeal bread
- spaghetti
- wholegrain cereals
- skimmed milk
- yoghurt
- fruit
- vegetables
- beans and pulses

Try to avoid simple carbohydrates with a high GI index. These include:

- muesli bars
- cakes
- biscuits
- cereals
- puddings
- soft drinks and juices
- jam and honey

Box 1 Suggestions for pre-competition food

- Pasta or rice with low-fat tomato-based pasta sauce
- Baked potato served with baked beans
- Granary bread sandwich with tuna
- Fresh fruit salad and yoghurt
- Scrambled eggs and fresh granary toast

Box 2 Pre-event checklist

- Eat at least 3 hours before competition.
- Choose a meal high in complex carbohydrates.
- Consume small amounts of protein and fats.
- Restrict sugary foods.
- Avoid bulky foods.
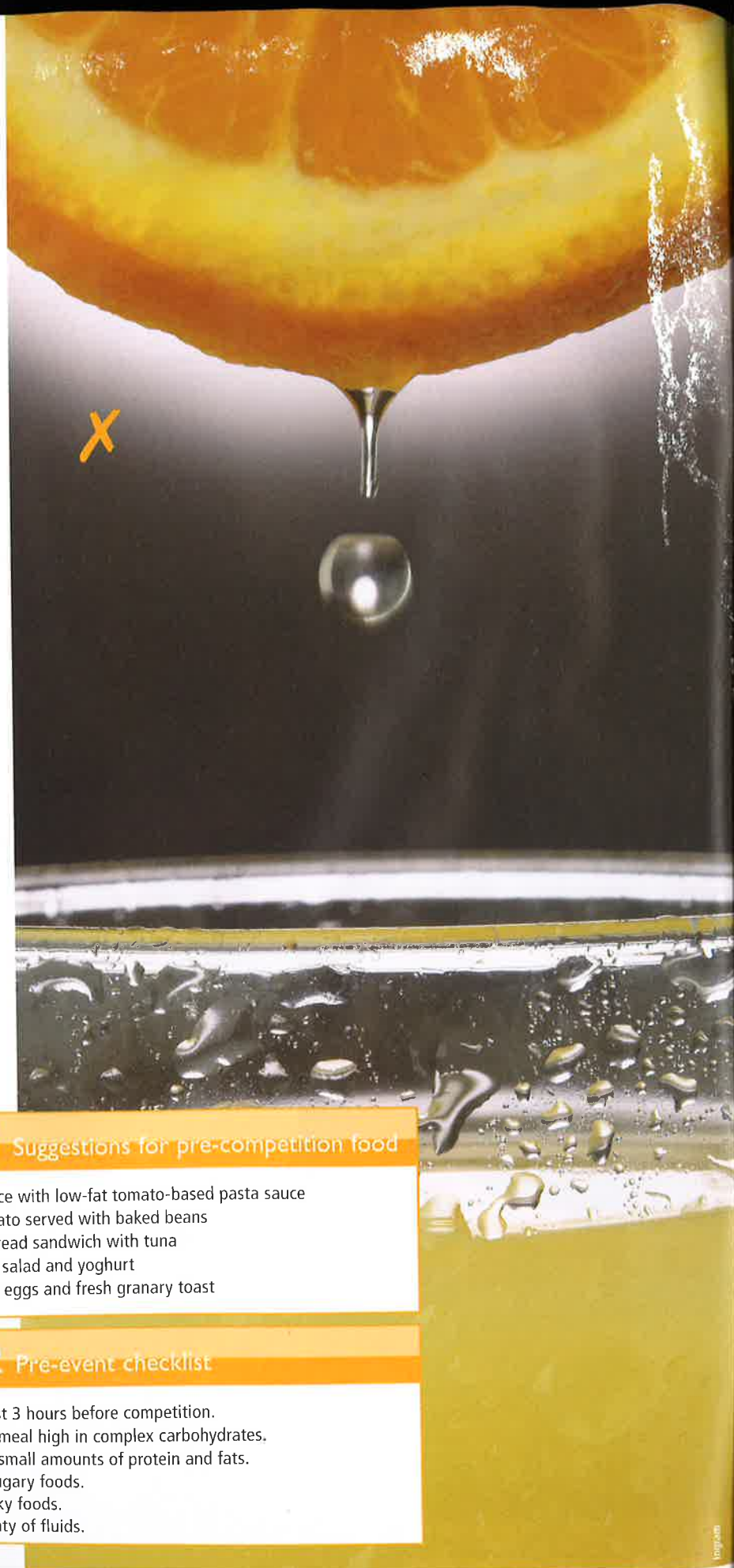- Drink plenty of fluids.

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Table 2 Calories in food

Food	Portion size	Portion size
Brown bread	One slice	75 calories
Spaghetti	One cup	220 calories
Tomato and basil pasta sauce	Half a cup	50 calories
Scrambled eggs	Two	190 calories
Baked beans	One cup	230 calories

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The sugars in these foods cause a sudden increase in your blood sugar levels due to their high GI index. As a result the body produces insulin to bring these high sugar levels back down and consequently they drop below normal levels, making you feel tired. This will affect your performance during a game.

Box 1 gives suggestions of possible meal options that a performer could choose as a pre-competition meal.

When is the best time for me to eat?

You need to time your pre-competition meal so that it will be digested and absorbed in order to be useful by the time of competition. Depending on what you ate, it may take 2–3 hours for

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complete digestion to take place, so on a match day a pre-competition meal should be consumed approximately 3 hours before the competition.

Box 2 provides a pre-event checklist that you can use to plan your match-day intake.

How much food should I eat?

Most nutritionists recommend that a pre-competition meal should be no more than 1,000 calories, suggesting an optimum of between 500 and 700 calories. This means that the pre-competition meal is quite substantial. If you look at the foods in Table 2, one cup of spaghetti and half a cup of tomato and basil sauce add up to approximately 270 calories.

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What should I drink?

Water is important for its role in regulating body temperature. When you take part in exercise, energy is required and some of that energy is released as heat. Water will keep you from overheating. Sweating and evaporation cool you down, but this means water is lost during the cooling down process.

Water loss during exercise can lead to a drop in blood volume. When this

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occurs, the heart works harder to move blood through the bloodstream and the amount of oxygen available to the working muscles is less. This will affect performance. It is therefore important to drink early and often when exercising. Sports nutritionists suggest that you should drink:

- two to three cups of water during the pre-competition meal
- two cups of water 1–2 hours before the competition
- a further two cups of water half an hour before the competition

In conclusion, it is important to eat the right foods before competition to ensure optimum performance, but no two people are the same and what works for one individual may not be suitable for another. However, what does appear to be important is that the pre-competition meal is loaded with carbohydrates and that enough time is given for digestion between eating and competing so that the food is fully absorbed and ready to be used as fuel.

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The traditional Shrovetide football game at Ashbourne

The emergence of rational sport

The nature of both society and sport changed significantly as a result of the Industrial Revolution. **Adam Morton** describes these changes and explains how sport reflects society

Sport is often described as reflecting society (Box 1) and this is certainly true when we consider sport in pre-industrial times. Feudal society was split into two classes: the wealthy, privileged gentry and the poor peasantry. There was no middle class. Similarly, sport was two-tiered and the two groups of people did not compete against each other.

Preparing for war

Before the invention of the steam engine, transport was limited and people lived largely agricultural lives. Consequently, sport was localised and rural, taking place in large open spaces, often using natural boundaries and only involving people from a particular village or area. Events took place occasionally, on holy days or seasonal festivals such as Shrove Tuesday (Box 2) or May Day, when there was less agricultural work to do. These events are known as **festival games**.

The frequency of war meant that sport was seen as a way of preparing for combat. Hunting and survival skills were also important. Hence, combat-based and violent sports were common, including archery, wrestling and mob games, with activities such as jousting — which frequently killed or injured knights — for the gentry.
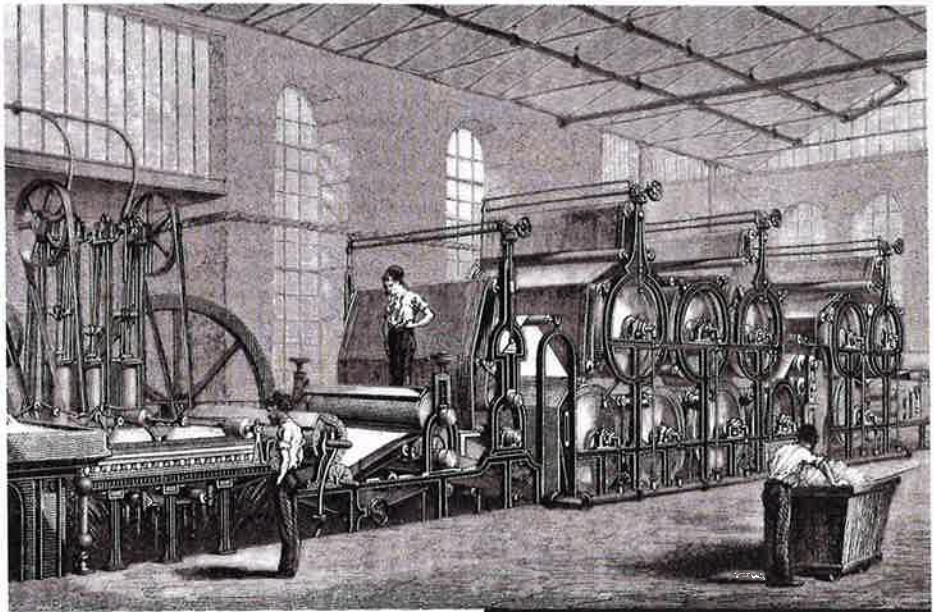
Pre-industrial games were male dominated, often involving wagering, and simple — characterised by a limited number of rules that were spread by word of mouth, because the peasants tended to be illiterate. The local gentry and church were influential in providing the ground to play on and prizes. This involvement is referred to as **patronage**.

Urbanisation and spectatorism

From the mid-eighteenth to the mid-nineteenth century, the Industrial Revolution saw the building of factories and the creation of jobs. Towns and cities grew as huge numbers of people moved from their rural homes seeking employment and regular, albeit low, wages. This process of urbanisation dramatically increased population density, reducing the space available for people to play sport.

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The Industrial Revolution led to factories being built and large numbers of people moving to the town and cities

The number of players in games became limited and, in direct contrast to popular recreations, few played sport and many watched. This change of emphasis led to the rise of **spectatorism**.

The twin processes of urbanisation and industrialisation drove a number of significant changes in society that were reflected in sport and led to the need for codification. Industrial factory life meant that the occasional nature of sport changed and eventually the introduction of a number of working reforms, including the half-day holiday on Saturday afternoons, meant that along with some disposable income, people had regular periods of time off when they were able to spectate.

The desire for a healthy and disciplined workforce led to industrial patronage, where factory owners formed and sponsored teams. Founded in 1878 as Newton Heath, Manchester United players originally all worked for the Lancashire

and Yorkshire Railway. West Ham United (Thames Ironworks FC) is another example of what are sometimes known as works teams. Similarly, church teams were formed, such as Manchester City, which was founded in 1880 as St Mark's Church.

Codification and NGBs

Regular fixtures and improvements in travel with the developing railway network opened up the possibility of national leagues. As matches between teams from around the country became increasingly frequent, there emerged a need for a common set of agreed, formalised rules by which each sport could be played.

This process, known as **codification**, was a key feature in the development of sport. National governing bodies (NGBs) were formed in the latter half of the nineteenth century, and the founding of the Football Association (FA, 1863), Rugby Football Union (RFU, 1871) and Lawn Tennis Association (LTA, 1888) heralded the emergence of rational sport.

While the railways had facilitated national sporting competition, the introduction of steam ships soon made international competition possible. The first cricket test match between England and Australia took place in 1877, with the first England vs Scotland football match having occurred slightly earlier, in 1872.

Alongside this, society became increasingly civilised and as a result sport became less violent. The formation of the RSPCA curbed animal cruelty and the Baths and Wash Houses Act 1846 saw the building of public baths as part of a drive for a healthier nation. Improved transport links together with improved education, increasing literacy and the burgeoning print media resulted in fans travelling to support their teams. Entrepreneurs saw the opportunity to charge spectators to use purpose-built facilities for playing and watching sport. The rise of sport as business soon led to a divide between professional 'players' and amateur 'gentlemen' that wouldn't be completely resolved for more than a century.

Public schools and Oxbridge

Public, fee-paying schools tended to be boarding schools where pupils from all over the country lived while they studied. The more established schools such as Eton existed for several hundred years before the Industrial Revolution, but the emergence of the middle class meant that there was an increasing demand for education.

The pupils brought with them different versions of their local games. In order to play these at school they needed to agree a shared set of rules. A similar process took place when public schoolboys took their games to university, again each with their own sets of rules. The first Oxbridge varsity

matches took place in 1827 (cricket), 1829 (rowing) and 1872 (rugby), with athletes being awarded blues for representing their university. It was in this melting pot that we see the beginnings of codification.

Before codification, schools playing inter-school fixtures would either agree a set of rules before the game or simply split it into two halves, each with different rules. Sports historians believe this to be the origin of half time. A key figure at this stage was Dr Thomas Arnold, the headmaster at Rugby School (1828–1841), who largely let boys play their own games, as long as they were on school grounds. This served as a form of social control, reducing the chances of them getting into trouble.

However, sport soon came to be seen not just as a way of improving the behaviour of pupils but also of teaching important values such as teamwork, leadership and discipline. These qualities were associated with team games in particular and hence the **games ethic** was born. The terms **muscular Christianity** and **athleticism** were linked to this and refer to the idea that manliness and godliness go hand in hand with the desired combination of physical prowess and moral integrity.

Sport was used as a marketing tool to promote a school's reputation. Sporting facilities were built and professional coaches — often former pupils and Oxbridge blues — were employed. This is still true today, as some schools employ former professional athletes as coaches and enjoy outstanding facilities, including Olympic-sized swimming pools and county-standard cricket wickets.

Box 3 CATPUCCIA

Factors contributing to the export of the games ethic:
- Church
- Army
- Teaching
- Patronage
- University
- Colonialism
- Clubs
- Industry
- Administration

While sport also developed outside of universities, it was largely former public school pupils who went on to become administrators in the newly formed NGBs and so tended to have the most influence when it came to codification. This process largely related to boys' games but by the middle of the nineteenth century a number of prestigious girls' schools had been founded and sports such as tennis and cricket were played.

In the late nineteenth century Pierre de Coubertin visited British public schools and was inspired to found the modern Olympic movement. However, what is not often mentioned is that de Coubertin believed, in line with the dominant social opinion, that women's role in sport was not to participate but to applaud male athleticism — a further example of how sport reflects society.

Exporting the games ethic

Public schools and Oxbridge played an important role in the export of the games ethic around the globe. Young men, educated to become leaders of the British empire, spread the games ethic in a number of ways. These are summarised using the mnemonic CATPUCCIA (Box 3). Sports historian Allen Guttmann (2000) describes 'The nineteenth-century diffusion of modern sports from England to the entire world' as follows:

> Wherever British military men, colonial administrators, missionaries, educators, settlers, or entrepreneurs went, they carried with them their enthusiasm for cricket, soccer, rugby and the entire gamut of modern sports.

This was seen as a powerful method of instilling moral values in people and we see the legacy of this today, particularly in countries that were formerly part of the British empire, for example with cricket in India and rugby in New Zealand. More recently the cultural influence of the USA can be seen in the popularity of baseball in Japan, Cuba and the Dominican Republic, and the global spread of basketball.

Conclusion

Prior to the Industrial Revolution, sport largely consisted of popular recreations such as mob football. These reflected society: taking place

occasionally, being two-tiered, rural, localised and combat based with few rules.

Beginning in the mid-eighteenth century, the Industrial Revolution triggered significant social changes that led to the emergence of rational sport. Again, sport reflected society, becoming a product of urbanisation and improvements in transport and working conditions.

This ultimately led, via public schools and Oxbridge, to the formation of NGBs and the codification of sport. The changes that occurred at this time laid the foundations for the commercial, entertainment-based and global version of sport we know today.

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