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**Beautiful Structures and Spectator Comfort**  
Structures merveilleuses et confort des spectateurs  
Wunderbare Bauwerke und Zuschauerkomfort

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#### **SUMMARY**

The future of sport depends on providing venues which satisfy the needs of its supporters. They must have character to enable the spectator to share the event with the crowd and experience the thrills of live sport but also offer a range of facilities, which will cater for all tastes and interests. With the help of modern technology we must find engineering and design solutions with a vision, so that the new stadium can provide an entertaining show based on the sporting event and, therefore, compete with television and attract a wider audience.

#### **RÉSUMÉ**

L'avenir du sport dépend de la qualité des stades répondant aux exigences des spectateurs. Ils doivent avoir un certain caractère pour permettre au spectateur de vivre l'événement sportif en symbiose avec la foule et d'éprouver toutes les sensations qu'il procure dans le stade mais aussi fournir toutes les installations qui répondent aux goûts et intérêts de chacun. Grâce à une technologie de pointe, architectes et ingénieurs doivent concrétiser leur vision, de façon à ce que le nouveau stade offre un spectacle complet et divertissant centré sur l'événement sportif et par conséquent, fasse concurrence à la télévision et attire ainsi un public plus grand.

#### **ZUSAMMENFASSUNG**

Die Zukunft des Sportes hängt von der Bereitstellung von Stadien ab, die den Ansprüchen der Veranstalter genügen. Stadien müssen Eigenschaften haben, die es dem Zuschauer erlauben, in der Menge den Geschehnissen beizuwohnen und die sportliche Leistung unmittelbar mitzuerleben, aber sie müssen auch über Einrichtungen verfügen, die unterschiedlichen Interessen und Bedürfnissen gerecht werden. Mit Hilfe moderner Technologie müssen konzeptionell neue bauliche und stilistische Lösungen gefunden werden, so dass neue Stadien auch dem jeweiligen sportlichen Anlass angepasste Unterhaltungsdarbietungen erlauben, womit das Fernsehen konkurrenziert und eine größere Zuschauermenge angezogen wird.



*"Study the past, if you would divine the future"*  
Confucius (551 - 479 BC)

**The future of sport depends on satisfying the needs of its supporters.**

Facilities which accommodate large numbers of spectators and require significant long span engineering solutions can sometimes be bleak utilitarian spaces. It seems that the emphasis on the engineering solution can sometimes distract the design team from the real agenda of providing beautiful buildings which are comfortable to the spectators. We are now well into the third sports revolution. The first, the 'rules' revolution, allowed the informal games then played by small communities and the landed gentry to be organised and the rules of modern sports were formed leading to a peak of spectators watching live sport in the mid twentieth century. The second 'television' revolution started in 1937 allowing the broadcast of live sport around the world to hundreds of millions of armchair spectators. Now the 'entertainment' revolution, the third in this sequence means sport is big business, competing for our leisure time along with all other forms of entertainment. But what do today's spectators seek from our sports venues and how well do our engineering and design solutions satisfy their needs ?

**Stadia are places of worship, elation, disappointment & sometimes money making.**

People attend live sport to be part of the occasion, to be involved and join the crowd, to be at one with the event and feel comradeship and togetherness, to be part of something for better or for worse. They want to be able to experience the day and say 'I was there' and then relive it with their friends for days afterwards. Some individuals may only ever experience this sense of being a part of a community, part of a sports brotherhood at an event and it is not surprising therefore how devoted they can become.

Just like any other established community they will be attached to their traditions, they will be resistant to change and they will be violent if that is what their 'community' dictates. The long term aim of sports design must therefore be to provide all the facilities their 'community' requires, retaining those features which are special to their established traditions and eliminate those factors which can lead to their anti-social behaviour. Our building solutions must therefore also reflect these traditions using structural solutions which are not just 'finely engineered good solutions' but which are also appropriate solutions, solutions which have character.

**Stadia are places where memories are made.**

The expectations of a typical spectator starts to build well before the event and on the actual day steadily climbs to a peak, in the ideal circumstances, at full time. The climax of the event is the final whistle or the crossing of the line and after that single moment the emotions start to wane until they depart and eventually arrive home still full of the success or failure of the day.

During this emotional cycle there is a time when they become one with the crowd, when crowd behaviour takes over as evidenced in the good times by the Mexican wave now commonplace in our stadia but in the bad time by mob and eventually riot behaviour. The turning point is rarely one isolated event but usually a collection of events, established attitude and often media build-up, it is often planned but once it starts, it is rarely controlled.

**Our sports venues reflect society, introspective & protective, flamboyant & expansive.**

Sports stadia and arenas accommodate all of society, they are as much a part of our culture as our town halls, churches and cafes and cater to a wide cross section of people who are attracted to the extremes of physical effort and the precision of the human body and mind. More recently our stadia have become hosts to people attracted to other pursuits mainly in the world of music, but religious and other followings are also well represented.

These multi-user buildings will contain the population of a large town for a few hours or a whole day and they must be able to cope with the depth of problems our towns and cities experience every day of the year because when the spectators enter through the turnstiles these problems are not left outside. In the same way our engineering and design solutions must also reflect the diversity of culture in our towns and cities where comfort standards of the population are improving. It is no longer acceptable in our sports venues to place columns between the spectators and the playing area or leave vast areas of exposed concrete to weather and discolour over the years. Our stadia must become more enclosed, more controlled environments with engineering solutions which are subdued but no less ingenious. Our future stadia and arenas will require a wider range of services than in the past and the latest technology.

Technology will be a major design factor in the future, seats will be warmed by low voltage trace heating elements eventually even in the concrete structure itself. Cooling can be by chilled air outlets below the seats from high pressure chilled pipes and local fans. Even the seats are changing being ergonomically designed with integral padding of soft plastics bonded in manufacture. These will give the effect of a padded seat but in a seamless and therefore weather proof shell. In one arm will be the sockets for plugging in personal headsets to listen to 'Stadium Radio' or 'Stadium Television' if the receiver is hired. As the average population size increases the seat spacing will also increase and allow for slight adjustment of seat backs to suit the individual spectator. Pockets on the back of the seat in front will contain the free 'Stadium Catalogue' advertising products on sale by post or from the Stadium Retail Centre. Items will be able to be ordered using the hand held receiver hired for the day, purchases can either be waiting for you at the shop at the end of the match or delivered to your seat at half time.

### **Concessions & Support Facilities**

Support facilities are providing amenities for all the family to enjoy as well as other entertainment areas for those not committed to the event. They will eventually include every type of function from business centres to video game arcades, similar to the range of facilities found in an international airport. Attractions will be designed to encourage spectators to arrive early and then stay on afterwards perhaps even sleeping overnight in the Stadium Hotel. Tomorrow's stadia will be places of entertainment for the family where sport is the focus but not the complete picture. It will be possible for five members of a family to arrive and leave together but in the intervening period experience five different activities. While the parents 'see' the live game their children may 'experience' the live game in the virtual reality studio where images from the 'in pitch' cameras provide close immediate action.

### **Technology**

It wasn't until the 1932 Los Angeles Olympic Games that technology was used to determine the result of an event for the first time and the Kirby Photo finish Camera took one hour to produce the result, technology is now essential to the smooth operation of a sport and the venue. We expect races to be timed to thousandths of a second, drug samples to be analysed in laboratories to particles per million and video play backs provided instantly. This is only the tip of the technological iceberg. In terms of stadia development we are already benefiting from more efficient construction techniques allowing opening roofs, moving seating tiers and soon moving playing areas. The Japanese are developing a robot building system which will work 24 hrs a day 7 days a week which would suit stadia's repetitive forms.

The line between natural grass and synthetic pitches will merge in years to come with developments in plastic mesh root reinforcement, plastic turf support and plastic granular growing mediums with computer controlled nutrient injection. Combined with this, new hybrid grass types require less light, grow faster and are far more robust. These advances in pitch design allow a greater number of different types of events to take place at the same venue, increasing spectator type and numbers and adding to the venue's financial viability. Viewing standards defined by sight lines for most stadia are now calculated on computer and the creation of three dimensional computer models of stadia developments will allow spectators to see exactly the view they will have from their seat at the time of booking. This can be extended to see the whole stadium in three dimensions allowing detailed analysis of the safety system.



### **Information and Communication**

Major advances are being made in communication and information technology which can now provide the spectator with all the advantages of the television viewer at home. Information must be provided to the live audience to keep them knowledgeable about the event and the stadium they are watching it from. This knowledge entertains and extends the attention span which prevents boredom and irritation in the crowd. It can be used to attract spectators into the stadium early and keep them later reducing the pressure on the circulation system. This peripheral information is particularly important when we recognise that the period of actual play is often only a fraction of the full time period for the event. One set of tennis at Wimbledon for example which lasts 30 minutes may only have four or five minutes of actual play. A five set match which lasts two and a half hours may only have twenty to twenty five minutes of play. A football match which lasts one and a half hours may again only have twenty minutes of action leaving plenty of time for the attention to wander. The speed of play is also increasing with Guy Forget serving at the last Wimbledon around 132mph, Malcolm Marshall the fast bowler for the West Indies cricket team has been timed at 90mph and Nolan Ryan pitcher for the Texas Rangers sending the ball at an amazing 104mph when in ice hockey the puck often travels at over 90mph. This is information the spectators want to know for them to be contented and occupied.

### **Television**

Television is in direct competition with live sport, coverage is usually a seamless mix of live action, recorded highlights, action replays, interviews, previews and postscripts which are presented to the viewer in such a way that it is no longer simply the relay of an event but the production of an entertaining show based on the event. The idea is obviously to attract a wider audience than just the dedicated sports fan who would watch anyway. This should also be the aim of the modern sports stadia and one answer is to compete with television on equal terms, offering information equal to the professional broadcasters at facilities which are as safe and convenient as our own homes. Replays and information about players and previous matches should be automatic but so should highlights of other events, statistics on the game, expert commentary and perhaps even advertising.

This can be achieved through 'narrow casting' by the stadium's own CCTV network, eventually by satellite, not just to one or two large video screens but also small personal receivers with screens a few inches across. These receivers will be part of the ticket price or on hire for the day and will only receive the stadium channel; probably with ear phones and eventually with interactive controls allowing a choice of information. Press the 'statistics' button and type in your favorite player's name and his career statistics will be displayed, press 'action' and type in the date of the match and see the highlights of his match winning performance two years ago. All this is possible now with 'narrow casting' radio used at Wimbledon for the first time this year and Arsenal investigating an infra-red system for next season. The horse racing industry is tending to lead the field, The Hong Kong Jockey Club has developed its own hand held betting device which is about the size of a television remote control and will allow the spectator to place a bet on any horse in any race and also provide the latest betting information, their next step is to show the race on the same piece of pocketable equipment. Stadium supervision and security by television and remote camera is already operating in major stadia.

### **The perfect stadium is the one in which your team never loses.**

As designers we must recognise the problems of the past and apply to new solutions our vision, a vision which sees a bright future for this very special type of building. A vision which believes in progress in sport and its venues and an understanding of how modern technology can help to find that solution. Our stadia of the past have often been barren, unfriendly, under-serviced and brutal places which have not kept pace with our societies, these solutions are no longer acceptable and a new breed is about to emerge. Like the little boy who always listens to sport on the radio because the images he creates in his head always look better, we must hold in our minds our own vision of the perfect sports venue and do our best to achieve it for future generations of sports fans.