



House of Commons
Science and Technology
Committee

**Human Enhancement
Technologies in Sport**

Second Report of Session 2006–07

*Report, together with formal minutes, oral and
written evidence*

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The Science and Technology Committee

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Summary

Whilst there has been much progress in the fight against doping, more needs to be done. This is of particular importance since it is essential that the UK plays 'clean' and sets a good example for the 2012 Olympics. The UK Government needs to take a very strong stance against doping.

Whilst it is the athlete's own responsibility to ensure that they are not taking illegal substances into their bodies, more comprehensive education is required from the early stage (for example, by education of school children into risks of doping), throughout an athlete's career and for those in supporting roles (for example, coaches and medics).

An independent agency should be established for the investigation and prosecution of doping offences.

It is important to increase research into potential illegal HETs. It is also important to increase research into normal physiology to enable better understanding, and hence detection, of doping and the effects different HETs have. The development of a blood profiling passport would contribute to such research.

Better understanding of legal mechanisms for enhancing performance is required. Better horizon scanning of new developments (e.g. in medical research) is required. There is a need for increased funding for sports science. There is also a need for better translation of research from other disciplines into sport.

The UK should prepare to scale up drug-testing during the 2012 Olympics well in advance of the Games.

1 Introduction

The importance of sport

1. Sport is an important and economically significant industry in the UK. In March 2006, the Chancellor announced £200 million of public money for high performance sport through to 2012. This sum was to be added to the £60 million a year of public money already invested in UK Olympic and Paralympic success, and UK Sport indicated that another £100 million would be sought through private investment.¹ Over and above its economic importance, however, sport and sportspeople can have a strong influence over certain sections of society, particularly young people, inspiring new ambitions and setting examples of behaviour. Sport can also be important to the wider population, especially where success can contribute to general well-being and national pride. A good example of this is the winning of the UK bid to hold the 2012 Olympics in London, the first time the Olympics have been held in Britain since 1948.

Doping in sport

2. In sport, the term ‘doping’ refers to the use of performance-enhancing drugs which have been prohibited by sporting regulatory organizations. There have been many cases of doping in recent years. For example, in 2004, British cyclist David Millar was banned for two years after admitting using the banned hormone erythropoietin² and in July 2006, World and Olympic 100 metres champion Justin Gatlin admitted failing a drugs test for testosterone.³ During the time-frame of this inquiry, we have heard of many further doping scandals, including that of Pakistani fast bowlers Shoaib Akhtar and Mohammad Asif who tested positive for the banned substance nandrolone.⁴

3. The prevalence of doping in sport has been attributed to a number of factors. Athletes are often under significant pressure to deliver medal-winning performances. They may also face team pressure where success is dependent on the performance of all. There are often significant financial gains to be made from success in many competitive sporting events. Other factors contributing to doping in sport might include a perception that other sportsmen and women are doping and getting away with it and that competition is imbalanced should an individual athlete choose not to go down the same route. Finally, the ease of availability of many prohibited substances may be an exacerbating factor.

4. There is a perfectly logical line of argument which suggests that the use of enhancement technologies to improve athletes’ performance is no more than an extension of the training, nutrition and other regimes that are already deployed to this end. This, for some, points to total deregulation. For many more, the arguments against deregulation – that human enhancement techniques are potentially harmful to people, that they run

1 *UK Sport welcomes Budget Announcement*, 22 March 2006, <http://www.uksport.gov.uk/news/2284/>

2 “Millar in Doping Trial”, 8 November 2006, *The Daily Telegraph*

3 “Gatlin admits failing drugs test”, 29 July 2006, *BBC Sport*, <http://news.bbc.co.uk/sport1/hi/athletics/5227956.stm>

4 “Cricket bans divide the fans”, 2 November 2006, *BBC News South Asia*, http://news.bbc.co.uk/1/low/world/south_asia/6110164.stm

completely counter to the “spirit” of sport and that they are essentially a form of cheating – carry much weight. Like most of those involved, we do not support deregulation of human enhancement technologies in sport, but for a system of regulation to be effective, it must meet certain clear criteria. It must be equitable, it must respect the fundamental human rights of those engaged in sporting activities, it must be proportionate to the dangers it seeks to avoid, it must be as scientifically unimpeachable as it is possible to be and it must be well-administered and properly funded. This Report seeks to examine whether the present system of regulation of human enhancement techniques in sport meets these tests.

The inquiry

5. On 1st March 2006 we launched our inquiry into the use of human enhancement technologies (HETs) in sport. We believe that it would be of major credit to the United Kingdom if the 2012 Olympic Games were remembered as a major sporting event in which doping did not detract from its success. We therefore set out to ‘horizon-scan’ future illegal HETs and to determine the UK’s current arrangements for countering doping and its intentions for doing so during the 2012 Olympics. In addition, the Committee was keen to evaluate mechanisms by which UK athletes can be supported in their pursuit of sporting success, with particular interest in some of the legal mechanisms by which an athlete’s performance may be enhanced.

6. Given the broad subject area, the Committee decided to limit the scope of this inquiry to HETs which may be used to enhance human performance through changes to human physiology, for example with use of biological or chemical techniques. Use of equipment in either Olympic or Paralympic sports was therefore considered to be outside the remit of the inquiry.

7. In our press release (no. 24 of Session 2005—06), the Committee invited evidence on the following points:

- i) the potential for different HETs, including drugs, genetic modification and technological devices, to be used legally or otherwise for enhancing sporting performance, now and in the future;
- ii) steps that could be taken to minimise the use of illegal HETs at the 2012 Olympics;
- iii) the case, both scientific and ethical, for allowing the use of different HETs in sport and the role of the public, government and Parliament in influencing the regulatory framework for the use of HETs in sport; and
- iv) the state of the UK research and skills base underpinning the development of new HETs, and technologies to facilitate their detection.

8. We launched this inquiry with a public seminar in which we heard from Mr Linford Christie OBE, Olympic gold medal winner and Dr Roger Palfreeman, British Cycling Medical Officer. We also heard from Professor Ron Maughan of Loughborough University, Mr Steve Maynard from HFL Ltd (a WADA-accredited testing laboratory) and Professor Julian Savulescu from the University of Oxford.

9. We held four oral evidence sessions, during which we heard from:

- The Head of the Elite Sports Team at the Department for Culture, Media and Sport (DCMS), Mr Matthew Reader; Mr John Scott (Director) and Ms Allison Holloway (Education Manager) of the Drug-Free Sport programme of UK Sport.
- Professor Ian McGrath, University of Glasgow and current Chairman of the Physiological Society, Dr Anna Casey, a research leader from QinetiQ, Dr Bruce Hamilton, Chief Medical Officer at UK Athletics and Dr John Brewer, Director of Sports Science and the Lucozade Sport Science Academy at GlaxoSmithKline.
- Dr Richard Budgett, Chief Medical Officer of the British Olympic Association; and Professor Arne Ljungqvist, Chairman of both the International Olympic Committee (IOC) Medical Commission and the World Anti-Doping Agency (WADA) Health, Medical and Research Committee.
- The Right Honourable Richard Caborn MP, Minister for Sport, DCMS

10. The transcripts of these sessions are published with this Report, together with the written submissions received in response to our call for evidence and requests for supplementary information.

11. In July 2006 members of the Committee attended the European College of Sports Science (ECSS) 2006 conference held in Lausanne. This visit gave us the opportunity to learn about use of HETs in sport and the surrounding ethical debate. The Committee also travelled to Australia where we met, amongst others, representatives from the Australian Sports Commission (ASC) and the Australian Institute of Sport (AIS), the New South Wales Institute of Sport, the Court of Arbitration for Sport, the Australian Sports Anti-Doping Authority (ASADA), The Garvan Institute, the Therapeutic Goods Administration, Sports Medicine Australia and parliamentary representatives, including the Australian Minister for Sport Rod Kemp MP. We also visited the Loughborough University and English Institute of Sport (EIS) to enable us to compare UK sports training facilities with those we saw in Australia and to take the opportunity to discuss some of the issues surrounding sports science with UK academics. We are grateful to all who helped organise these visits and contributed evidence to this inquiry. We would also like to place on record our thanks to our specialist adviser, Professor Ron Maughan from the School of Sport and Exercise Sciences at Loughborough University.

2 Background

Sport in the UK

The Department for Culture, Media and Sport

12. The Department for Culture, Media and Sport (DCMS) is responsible for Government policy on sport. The DCMS website states that the Department's aim is "to encourage wider participation in sport, helping to create a more active nation and improve performance" and that their vision is that the UK be "re-established as a powerhouse in the sporting world".⁵

13. DCMS provides significant funding for sports provision and improving the quantity and quality of sporting opportunities. The Department aims to support equality in sport, community sport (for example, through funding of community sports clubs and skills training for coaches, trainers and teachers of sports) and professional sport (for example, through working with National Governing Bodies of sports [see below] to make sure that the interests of professional sport are well represented within Government). DCMS also committed over £1 billion during 2001-06 to the development of sports facilities, such as the new Wembley Stadium project.

UK Sport

14. UK Sport was established by Royal Charter in 1996 and is principally funded by, and accountable to, the DCMS. UK Sport co-ordinates sport policy and the support of elite sport at the UK level and manages and distributes public investment in sport. Of specific relevance to this inquiry, UK Sport is also responsible for the UK anti-doping programme.⁶ The main responsibilities outlined by UK Sport's Royal Charter are to:

- i. encourage and develop higher standards of sporting excellence in the UK;
- ii. identify sporting policies that should have a UK-wide application;
- iii. identify areas of unnecessary duplication, overlap and waste in the way that sport is administered in the UK;
- iv. develop and deliver appropriate grant programmes developed by the sport governing bodies with a UK or Great Britain remit in conjunction with the Home Country Sports Councils;
- v. distribute Lottery funds to UK-level sports with World Class Performance Plans in place;

5 http://www.culture.gov.uk/what_we_do/Sport/

6 "About UK Sport", http://www.ukssport.gov.uk/pages/about_uk_sport/

- vi. oversee policy on sports science, sports medicine, drug control, coaching and other areas where there may be a need for the Home Country Sports Councils to deliver a consistent UK-wide policy;
- vii. co-ordinate policy for bringing major international sporting events to the UK and use Lottery funds to support the bidding and staging process; and
- viii. represent the UK internationally and increase the influence of the UK at an international level.⁷

Sports Councils

15. While UK Sport operates at a UK level, the responsibility for developing sport on a home country basis, including the development of excellence and the provision of facilities, falls to the Home Country Sports Councils for England, Northern Ireland, Scotland and Wales. UK Sport takes a lead among the Sports Councils in all aspects of sport that requires strategic planning, administration and co-ordination. UK Sport also acts as the representative for the Sports Councils in matters of national benefit.⁸

National Governing Bodies

16. There is an enormous network of sports clubs throughout the UK, each of which is administered through the national governing body (NGB) for its sport. NGBs are the central point for a sport and the main support mechanism for athletes in a particular sport. They provide the link between recreation and development, training and competition and are involved in development of facilities and policy in the relevant sport. NGBs are also responsible for representing their members' interests to their sport's international federation and for establishing the rules for the sport or sports in conjunction with them. NGBs work closely with the Sports Councils and organisations such as the British Olympic Association in the co-ordination of team selection and preparation for international events.

17. NGBs sign up to the rules of the UK anti-doping programme and are responsible for investigating doping offences once a positive test result (for a banned substance) has been identified. NGBs are also responsible for the application of sanctions to athletes found guilty of doping offences.⁹

The English Institute of Sport

18. The English Institute of Sport (EIS), funded by the UK Sport Lottery fund, is a nationwide network of world class support services, designed to foster the talents of the UK's elite athletes. Services are offered from nine regional multi-sport hub sites and a network of satellite centres. The range of services supplied by the EIS spans sports science and sports medicine. Support includes applied physiology, biomechanics, medical consultation, medical screening, nutritional advice, performance analysis, psychology,

7 Doping Control Officer Handbook, *Doping and Sport*, <http://www.uk sport.gov.uk/images/uploaded/AntiDopingandUK.pdf>

8 "Sport in the UK", http://www.uk sport.gov.uk/pages/sport_in_the_uk/

9 "Model Rules for National Governing Bodies", http://www.uk sport.gov.uk/pages/national_anti_doping_policy/

podiatry, strength and conditioning coaching, sports massage and sports vision. There are almost 2,000 competitors currently in the EIS system.¹⁰

Anti-doping programmes

International Olympic Committee

19. The International Olympic Committee (IOC) is the supreme authority of the Olympic Movement. It is an international non-governmental non-profit organisation and the umbrella organisation of the Olympic Movement. Its primary responsibility is to supervise the organisation of the summer and winter Olympic Games and its role is to promote top-level sport as well as sport for all in accordance with the Olympic Charter.

20. Doping at the Olympic Games is banned for two reasons, according to the Olympic Movement Anti-Doping Code: first, the use of drugs is considered cheating, and second, drugs have adverse effects on the health of athletes.¹¹ Testing for drugs used to enhance performance has been carried out at the Olympic Games since they were held in Mexico in 1968, when Australia's Ron Clarke became the first athlete to be tested.¹² The IOC takes responsibility for determining Olympic testing programmes for doping. During the Salt Lake City Winter Olympics in 2002, the IOC worked with the WADA and national anti-doping bodies to ensure that 100 per cent of athletes were tested prior to attending the games, and it conducted testing of the top four athletes in an event and random testing throughout the duration of the games.¹³ The Turin 2006 Winter Olympics saw an overall increase of 72 per cent tests conducted when compared with Salt Lake City, with 838 urine tests (compared to 700 in Salt Lake City) and 362 blood tests (new compared to Salt Lake City).¹⁴

The World Anti-Doping Agency

21. The World Anti-Doping Agency (WADA) was created in 1999 to promote, coordinate, and monitor at the international level the fight against doping in sport in all its forms. WADA seeks to uphold a doping-free culture in sport and it combines the resources of sports and governments to “enhance, supplement, and co-ordinate existing efforts to educate athletes about the harms of doping, reinforce the ideal of fair play, and sanction those who cheat themselves and their sport”.¹⁵ As a mechanism for promoting a doping-free culture, WADA fosters the development of national anti-doping programmes and organisations.

10 “Who we are”, http://www.eis2win.co.uk/gen/who_01_whogetswhat.aspx

11 “Olympic Movement Anti-Doping Code”. Lausanne, Switzerland: International Olympic Committee, 1999.

12 “Drug testing at the Sydney Olympics, *Medical Journal of Australia*, http://www.mja.com.au/public/issues/173_06_180900/corrigan/corrigan.html

13 http://multimedia.olympic.org/pdf/en_report_441.pdf, “Post Games Report, Salt Lake City”, 8 February - 24 February 2002, IOC Medical Commission

14 “Torino 2006: figures on doping tests”, http://www.olympic.org/uk/organisation/commissions/medical/full_story_uk.asp?id=1718

15 WADA Mission, <http://www.wada-ama.org/en/dynamic.ch2?pageCategory.id=255>

22. WADA received its first two years of funding (US \$18.3 million) from the IOC on behalf of the Olympic Movement and is currently funded equally by the IOC and national governments. In 2006, the UK contributed US \$647,531 to WADA within the total European contribution of US \$4,911,586.¹⁶

23. WADA's key activities include:

- i. monitoring acceptance of and compliance with the World Anti-Doping Code;
- ii. educating athletes through the athlete outreach programme;
- iii. providing anti-doping education to athletes, coaches, and administrators;
- iv. funding scientific research to develop new detection methods;
- v. conducting unannounced out-of-competition doping control among elite athletes;
- vi. observing the doping control and results management programmes of major events;
- vii. fostering the development of National Anti-Doping Organisations (NADOs) and of anti-doping programmes;
- viii. accreditation of the laboratories in charge of the analysis of samples;
- ix. the preparation and review of the annual List of Prohibited Substances and Methods; and
- x. the implementation of ADAMS (Anti-Doping Administration & Management System), a web-based database management system that co-ordinates anti-doping activities and helps stakeholders meet their responsibilities under the Code.¹⁷

The WADA Code

24. The WADA Code, which was adopted in March 2003, is the universal document upon which the WADA programme is based. The Code adheres to the fundamental WADA principle that doping is contrary to the "spirit of sport".¹⁸ WADA interprets the term "spirit of sport" as "the essence of Olympism and how we play true". The WADA Code also states that the spirit of sport is the "celebration of the human spirit, body and mind" and that it is characterised by a number of values including: ethics, fair play and honesty, health, dedication and commitment and respect for laws and rules.¹⁹

25. The purpose of the WADA Code is to advance anti-doping effort through universal harmonisation of core anti-doping elements. The Code clarifies the responsibilities of stakeholders and brings harmonisation where rules or policies vary between different

16 WADA, 2006 contributions, http://www.wada-ama.org/rtecontent/document/Funding_2006_en.pdf.

17 WADA 'What is the code', Q and A on the Code: <http://www.wada-ama.org/en/dynamic.ch2?pageCategory.id=367>

18 The World Anti-Doping Code. Fundamental Rationale for the World Anti-Doping Code, http://www.wada-ama.org/rtecontent/document/code_v3.pdf

19 As above

sports and countries. For example, the organisations that sign up to the Code have to accept the WADA List of Prohibited Substances and Methods. Under the Code, WADA has the power to conduct testing and closely monitors doping cases.

The Prohibited List

26. The Prohibited List is an international standard which identifies substances and methods prohibited in competition, out of competition, and in particular sports. Substances and methods are classified by categories, for example as steroids, stimulants or for potential use in gene doping.²⁰ The List is broken down into sub-lists which indicate: substances and methods prohibited at all times (in and out of competition); substances and methods specifically prohibited in competition (such as amphetamine); and those prohibited in particular sports, for example, alcohol which is prohibited in a number of sports including archery, motorcycling and karate.²¹

27. Some of the substances featured on the WADA List are also controlled substances under UK legislation (Misuse of Drugs Act 1971) but their inclusion on the list is determined by a judgement by WADA of whether two out of the three following criteria apply:

- the substance or method enhances or has the potential to enhance sporting performance;
- the use of the substance or method represents an actual or potential health risk to the athlete;
- the use of the substance or method violates the spirit of sport described in the introduction to the Code.

A substance or method is also banned if it has the potential to mask the use of other Prohibited Substances and Prohibited Methods.²²

Therapeutic Use Exemptions

28. There are occasions when athletes need to take prohibited substances for the legitimate treatment of medical conditions. The WADA Code therefore permits athletes and their physicians to apply for a Therapeutic Use Exemption (TUE) which gives permission for an athlete to use, for therapeutic purposes, any of the substances or methods contained in the List of Prohibited Substances and Methods. The criteria for granting a TUE are as follows:

- the athlete would experience significant health problems without using the prohibited substance or method;
- the therapeutic use of the substance would not produce significant enhancement of performance; and

20 The WADA 2006 Prohibited List , http://www.wada-ama.org/rtecontent/document/2006_LIST.pdf

21 As above

22 WADA Code, The Prohibited List, p15, http://www.wada-ama.org/rtecontent/document/code_v3.pdf

- there is no reasonable therapeutic alternative to the use of the otherwise prohibited substance or method.²³

29. WADA has developed an international standard for TUE to ensure that the process of granting therapeutic use exemptions is harmonized across sports and countries. The international standard for TUE includes criteria for granting a TUE, confidentiality of information and the TUE application process.²⁴

30. In the UK, a TUE is granted by either the International Federation for a sport or UK Sport (as the National Anti-Doping Agency) who are then obliged to inform WADA so that it may have the opportunity to review this decision. WADA has two main roles in the TUE process. First, WADA reserves the right to monitor and review any TUE granted by a federation or anti-doping agency, and athletes who requested a TUE and were denied can ask WADA to review that decision. If WADA determines that a denial of the TUE did not comply with the International Standard, the Agency can reverse the decision. Secondly, WADA has powers of intervention in ensuring that TUEs are consistently granted. During the Olympics, the IOC Medical Commission appoints a Therapeutic Use Exemption Committee (TUEC) to assess each TUE application.²⁵

31. Athletes may apply for either a standard or an abbreviated TUE. A standard TUE must be supported by medical records or reports proving that the athlete has the determined condition and requires medication on the Prohibited List. An abbreviated TUE application form does not require such documentation and is only for the use of glucocorticosteroids by non-systemic routes (local routes of administration [for example, an inhaler] other than dermatological applications, which are not prohibited and do not require any TUE) and beta-2 agonists, for example, the asthma drug salbutamol which is taken by inhalation.²⁶

WADA testing programme

32. WADA runs a worldwide out-of-competition testing programme, focused on elite athletes, which complements national testing programmes. Since out-of-competition tests can be conducted anytime, anywhere, and without notice to athletes, WADA considers that they are the most effective means of deterrence and detection of doping.²⁷ WADA also participates in a taskforce with the IOC and the relevant Olympic Games Organizing Committee to ensure effective testing prior to and during the Games.²⁸

The UNESCO Convention

33. Signatories to the WADA Code must make sure that their own rules and policies are in compliance with the mandatory articles and other principles of the Code. However, since

23 Therapeutic Use Exemptions, <http://www.wada-ama.org/en/exemptions.ch2>

24 International Standard for Therapeutic Use Exemptions, http://www.wada-ama.org/rtecontent/document/international_standard.pdf

25 The International Olympic Committee Anti-Doping Rules applicable to the XX Olympic Winter Games in Turin, 2006, http://multimedia.olympic.org/pdf/en_report_1018.pdf

26 Therapeutic Use Exemptions, <http://www.wada-ama.org/en/exemptions.ch2>

27 WADA Doping Control, <http://www.wada-ama.org/en/dynamic.ch2?pageCategory.id=338>

28 As above

governments cannot be legally bound by a non-governmental document such as the Code, an International Convention under UNESCO (the United Nations body responsible for education, science, and culture) was drafted to allow formal acceptance of both WADA and the Code. The UNESCO-led International Convention against Doping in Sport was subsequently adopted by the 33rd UNESCO General Conference in Paris in October 2005²⁹ and 30 nations have now signed up.³⁰

UK anti-doping policy

UK Sport

34. UK Sport is the UK's recognised National Anti-Doping Organisation and as such, is responsible for the planning, collection and management of anti-doping controls in this country. With the support and backing of the DCMS, UK Sport has developed a national anti-doping policy for the UK.³¹ The UK's national anti-doping policy sets out UK Sport's commitment to the WADA Code, and outlines the roles and responsibilities of all parties involved in the anti-doping process. Fundamental to the UK anti-doping policy, and in line with the WADA Code, is the UK Sport-held principle that "doping in sport is cheating" and "contrary to the spirit of sport".³² The principal aim of the policy is "to protect an athlete's fundamental right to participate in doping-free sport and thus promote health, fairness and equality for athletes in the UK".³³ The UK Sport Policy is applicable to all sports which receive funding from either UK Sport or one of the home country sports councils. Through the Policy, UK Sport aims to:

- i. protect athletes and other participants in sport in the UK;
- ii. promote doping-free sport in the UK;
- iii. establish consistent standards of anti-doping policy, testing and education across the UK; and
- iv. encourage and build upon national and international harmonisation of anti-doping in sport.³⁴

35. The UK anti-doping policy is accompanied by a set of Model Rules which provide detail on specific aspects of the anti-doping programme, including testing, results management, disciplinary hearings and sanctions. They also set out in detail the provisions for implementing the Code and the UK anti-doping programme requirements.³⁵

29 Ev 61

30 Q 322

31 Ev 62

32 The UK's National Anti-Doping Policy, http://www.uk sport.gov.uk/assets/File/Generic_Template_Documents/Drug_Free_Sport/policy_160505.pdf, para 3

33 As above, para 4

34 The UK's National Anti-Doping Policy, http://www.uk sport.gov.uk/assets/File/Generic_Template_Documents/Drug_Free_Sport/policy_160505.pdf

35 Model Rules for National Governing Bodies, http://www.uk sport.gov.uk/assets/File/Generic_Template_Documents/Drug_Free_Sport/Model%20Rules%20-%20full%20final%20version.pdf

36. UK Sport manages UK anti-doping activities through its ‘Drug-Free Sport’ programme which had a budget of approximately £2.2 million for the period 2005 – 06. Under this programme, UK Sport oversees anti-doping education for athletes and a drug information database which enables athletes and support staff to check whether or not pharmaceutical products contain prohibited substances.³⁶

UK Sport testing programme

37. UK Sport also manages the UK’s drug testing programme which aims to:

- ensure that a minimum of 7,000 tests are conducted over the period 2006-07, all of which will be carried out in line with the standards set out in the WADA Code;³⁷
- ensure that at least 55 per cent of tests across all sports are no notice, out-of-competition tests;³⁸
- progress the development of an ‘intelligent testing’ regime to govern appropriate allocation of testing across all sports.³⁹

38. All testing takes place at no notice to the competitor and UK Sport selects events and training sessions to be tested based on recommendations made by the national governing bodies. Testing is weighted against a number of criteria, including whether there is a history of doping in the sport; the international status of the sport (Olympic, Commonwealth); the potential for drug misuse in the sport; and the public/media impact of a doping infraction in that sport.⁴⁰ Testing is targeted towards the elite competitive level of a sport and includes athletes named on the national and international athlete pool. Testing at elite youth level is also conducted.⁴¹

39. UK Sport conducts most of its testing ‘out of competition’. UK Sport told us that “over 50 per cent of all tests UK Sport conducts are now out-of-competition tests”, with the allocation of these being increasingly governed through the concept of ‘intelligent testing’. The term ‘intelligent testing’ refers to a focus on testing in association with key triggers within athletes’ performance and training cycles, identifying areas of ‘maximum risk’ of potential doping. This could include, for example, athletes returning from injury or preparing for major events. Through intelligent testing, UK Sport claims that it is able to “maximise the deterrent effects of the programme”.⁴²

40. UK Sport trains independent Doping Control Officers (DCOs) to take either blood or urine samples from athletes. All samples, whether taken by UK Sport or WADA, are

36 <http://www.uk sport.gov.uk/>

37 UK Sport manifesto for 2006-07, http://www.uk sport.gov.uk/assets/File/Generic_Template_Documents/Drug_Free_Sport/DFS_manifesto_0607.pdf

38 “Record number of tests in the past year”, UK Sport press release, 24 April 2006, <http://www.uk sport.gov.uk/news/2316/>

39 As above

40 Doping Control Officer handbook, organising testing, http://www.uk sport.gov.uk/images/uploaded/3_OrganisingTesting.pdf

41 As above

42 Ev 60

analysed at WADA-accredited laboratories. The UK currently has two WADA-accredited laboratories: The Drug Control Centre based at King's College London and the Drug Surveillance Group, HFL Ltd, Newmarket.

41. During testing, two samples (A and B) are taken for analysis. Following laboratory analysis of the A-sample, if no prohibited substances are found, a negative result will be reported to the relevant governing body or international sports federation and the B-sample destroyed. This report is usually available within 10 days of the sample collection (although, if required, results can be made available within 24 hours during a major competition). If the sample is positive, the process to deal with adverse findings falls into three stages: Review, Hearing and Appeal. The athlete may also request testing of the B sample where a positive result has been found.

Disputes in doping cases

42. Legal disputes in cases of doping are resolved through the Court of Arbitration for Sport (CAS). CAS was originally conceived by then IOC President Juan Antonio Samaranch to deal with disputes arising during the Olympics and, although established as part of the IOC in 1984, it is now a fully independent body. CAS is an institution independent of any sports organisation, providing services to facilitate settlement of sports-related disputes either through arbitration or mediation, by means of procedural rules adapted to the specific needs of the sports world. CAS is placed under the administrative and financial authority of the International Council of Arbitration for Sport (ICAS) and has nearly 300 arbitrators from 87 countries who have been chosen for their specialist knowledge of arbitration and sports law.⁴³

The ethics of doping

43. WADA and UK Sport take a strong stance against doping, with the view that it is against the 'spirit of sport', a value characterised by ethics, fair play and honesty, health, dedication and commitment and respect for laws and rules.⁴⁴ UK Sport told us that "doping has no place in sport" and that they "do not believe that the values that sport is meant to represent are helped in any way by people engaging in doping practices".⁴⁵

44. However, during the course of this inquiry, we heard the view expressed that doping is not in itself detrimental to sport. Professor Julian Savulescu from the University of Oxford told us that performance enhancement "is not against the spirit of sport" and that "there is no reason sport must remain purely a test of natural ability".⁴⁶ Furthermore, Professor Savulescu felt that anti-doping legislation should be removed "to permit safe performance enhancement".⁴⁷ In addition, when Members of the Committee attended the annual European College of Sports Science conference in Lausanne, we were interested to hear

43 Court of Arbitration for Sport, <http://www.tas-cas.org/en/histoire/frmhist.htm>

44 The World Anti-Doping Code. Fundamental Rationale for the World Anti-Doping Code, http://www.wada-ama.org/rtecontent/document/code_v3.pdf

45 Q 89

46 Ev 80

47 As above

presentation of arguments that “the current anti-doping campaign reflects an erosion of reason that is caused by a growing fear of scientific progress”⁴⁸ and that a more “liberal stance towards doping” should be taken in general.⁴⁹

45. The ethical debate is of particular interest when considering where the line should be drawn between what may be considered fair use of a mechanism for enhancing performance and what should be prohibited and thus classified as doping if used in sport. For example, whilst use of anabolic steroids which increase strength by encouraging muscle growth is banned, technologies such as eye laser therapy, used to dramatically enhance vision, are not. This is more than merely a philosophical question since the mechanism whereby the ethics of performance enhancement are taken into account by WADA and UK Sport is unclear. Whilst WADA have put in place an Ethics and Education Committee, the main role of this Committee appears to be in developing educational initiatives for athletes about the dangers and consequences of drug use in sports, as opposed to consideration of the ethics of doping or of the ethical arguments for listing certain items on the WADA Prohibited List.⁵⁰ We discuss this further below (see paragraph 62).

46. In addition, it is interesting that whilst WADA and UK Sport fund research, primarily into the detection of doping, we have found it difficult to track down sources of funding for research into the ethics of whether doping is problematic.⁵¹ **We believe that ethics are an important consideration in the fight against doping and are concerned that limited attempts are being made to address this issue. We recommend that UK Sport establish a Committee to examine the ethical aspects of doping in sport and advise WADA on possible changes to the consideration of ethical issues within its operations. We also believe that UK Sport and WADA should consider the case for funding research into the ethics of doping.**

48 *What's wrong with anti-doping: some thoughts concerning the fear of modernity and erosion of reason*, Professor Verner Moller, University of Southern Denmark. Abstract in conference proceedings. European College of Sports Science annual conference, Lausanne.

49 *What's wrong with gene doping: some slippery slopes arguments*, Professor Mike McNamee, University of Southampton

50 Ethics and Education Committee Meeting Minutes, July 2005, http://www.wada-ama.org/rtecontent/document/Minutes_07_1718_2005_EEComm.pdf

51 List of WADA supported research projects, <http://www.wada-ama.org/en/dynamic.ch2?pageCategory.id=332>

3 The culture of doping

Prevalence of doping

47. The Culture, Media and Sport (CMS) Select Committee, who held an inquiry during 2004 into drugs and role models in sport, concluded that there are relatively few athletes involved in doping in the UK.⁵² This opinion is supported by figures from the UK Sport testing programme in which of the 7,968 tests taken in 2005-06, only 1.3 per cent were found positive for banned substances.⁵³ There is, however, a slightly higher incidence of doping on the international circuit. WADA publishes an annual overview of the results reported by the accredited anti-doping laboratories, which shows that the number of adverse analytical findings for 2005 was approximately 2.1 per cent.⁵⁴

48. We were interested to determine whether recorded incidences of doping were an accurate reflection of its actual prevalence. Dr Bruce Hamilton from UK Athletics told us that he could “only suppose that [the illegal use of enhancement techniques] is widespread”⁵⁵ and that looking at positive test results as a measure of utilisation was unreliable.⁵⁶ Dr Richard Budgett of the British Olympic Association (BOA) told us that a lot of athletes and many professionals involved in anti-doping policy suspect that there are people who go undetected⁵⁷ and that, whether or not it is the case, there is perception that many athletes are cheating, with the result that athletes who had been found guilty of doping offences justified their actions by saying “lots of other people are cheating, most of my competitors are cheating, so I am just levelling the playing field”.⁵⁸

49. We were also interested to determine whether there is higher prevalence of doping in particular countries or sports. Professor Arne Ljungqvist, representing the IOC and WADA, told us that “quite a number of those found and finally judged to be guilty of doping offences come from the former eastern European countries”⁵⁹ and that, prior to the creation of the United States Anti-Doping Agency (USADA), there had been a “major problem with the United States”.⁶⁰ Dr Budgett told us that doping is more prevalent in certain sports and that in his own sport of rowing “there is a low prevalence of doping whereas in some other sports, like cycling, there are more cases”.⁶¹ When questioned further on why cycling should demonstrate a higher frequency of doping cases, both Dr

52 Culture, Media and Sport Committee, Seventh Report of Session 2003-04, *Drugs and role models in sport: making and setting examples*, HC 499-I Para 47, <http://www.publications.parliament.uk/pa/cm200304/cmselect/cmcomeds/499/499.pdf>

53 UK Sport Test results, http://www.uk sport.gov.uk/images/uploaded/report_270406.pdf

54 WADA 2005 Adverse Analytical Findings Reported by Accredited Laboratories., http://www.wada-ama.org/rtecontent/document/LABSTATS_2005.pdf

55 Q 166

56 Q 167

57 Q 198

58 Q 199

59 Q 202

60 Q 203

61 Q 205

Budgett and Professor Ljungqvist considered that this was the ‘culture’ of the sport⁶² and that there is “a great deal of money in professional cycling and therefore the stakes are much higher, and that will drive people to cheat”.⁶³ When discussing this issue informally with coaches and athletes in Australia and the UK, we found a general acceptance of the suggestion that doping was common in cycling.

50. We conclude that the official figures on the incidence of doping may well not accurately reflect the scale of the problem. We are also concerned that there is a perception that use of illegal substances in sport is widespread. It appears that doping is more prevalent in certain sports and countries and that this may be attributed to the ‘culture’ of these sports. **We recommend that UK Sport commission research into the real incidence of doping both in general and in particular sports in order that the magnitude of the problem may be understood and the means of tackling it may be better defined.**

Obtaining banned substances

The deliberate doper

51. We also looked at how athletes obtain illegal human enhancement technologies and raised the question of whether there is an element of pressure from athletes on their support staff, for example coaches or sports medics. Dr Bruce Hamilton of UK Athletics told us that team doctors “are always being asked to push the envelope where that grey area is within what is legal and what is not legal”.⁶⁴ Dr Budgett of the BOA reported incidences where, within a team, athletes were expected to be prepared to take banned substances, “otherwise you were letting the team down”.⁶⁵ His conclusion was that doping is generally driven by the individual and that those athletes who are involved in using banned performance enhancement technologies “spend a great deal of their time and energy covering up and worrying about it”.⁶⁶

52. There is easy access to banned substances for those athletes wishing to enhance their performance illegally. A range of companies supply banned substances over the internet. The European Specialist Sports Nutrition Alliance (ESSNA) drew attention to products that contain substances which are specifically banned by WADA but may be perfectly legal for general sale to ordinary consumers,⁶⁷ and we were surprised by the ease by which such compounds may be obtained. For example, the beta-blocker atenolol, used medically to treat high blood pressure and other heart conditions by reducing the heart rate and the heart’s output of blood, is readily available for purchase via the world wide web, despite being classified as on prescription-only in the UK.⁶⁸ Atenolol is banned by WADA for use

62 Q 207-209

63 Q 210

64 Q 109

65 Q 211

66 As above

67 Ev 74

68 The Drugstore.com, <http://www.drugstore.com/pharmacy/drugindex/rxsearch.asp?drug=Atenolol&trx=1Z5002>

in competition.⁶⁹ The UK pharmaceutical company British Dragon produces a range of compounds such as ‘Dianabol’. Dianabol contains methandienone, a steroid derivative of testosterone with strong anabolic (tissue building) and androgenic (controls the development and maintenance of masculine characteristics) properties and which increases protein metabolism and synthesis thus boosting muscle mass.⁷⁰ Methandienone is listed on the 2006 WADA Prohibited List⁷¹ and controlled, as a class C drug, under the UK Misuse of Drugs Act 1971. **We are concerned at the ease by which banned, and potentially dangerous, substances can be obtained for use by athletes and we recommend that the Government review regulation in this area.**

Accidental use

53. There is also evidence to support the theory that many athletes may take illegal performance enhancement technologies without knowingly doing so, for example through the consumption of contaminated nutritional supplements. Dr Anna Casey from QinetiQ told us that she considers that “one of the major threats” to the 2012 Olympics is potential contamination of food supplements, taken in good faith by athletes.⁷²

54. WADA has been aware of potential contamination of food supplements and the problems this may cause for some time. Professor Ljungqvist told us that during the first two years of WADA’s existence, a working group was established to look into the area of food supplements. The research carried out by a group in Cologne, led by Hans Geyer, showed that between 15 and 20 per cent of the food supplements tested were contaminated by or contained banned substances which were not indicated on the labels.⁷³ This evidence is, however, disputed by ESSNA who have told us in written evidence that although it has been alleged that “there are unscrupulous manufacturers who place on the market products that contain prohibited and sometimes dangerous ingredients and that there are also manufacturers who market products to elite athletes but who mislabel their products”, they have seen no “substantive evidence” to support this assertion and can see no commercial benefit to a company from adopting such behaviour.⁷⁴

55. Dr John Brewer, representing GlaxoSmithKline (GSK), recognised that, since there is a plethora of supplements that are available for athletes, “it is always going to be very difficult and very confusing for the athletes to know what works and also what is free of banned substances”. Mr Brewer therefore made the plea for a recognised standard of labelling of such products.⁷⁵ Dr Casey supported this view, telling us that “that there has to be, between now and 2012, more effort put into making available certified, contaminant-free food

69 The 2006 List of Prohibited Substances International Standard, http://www.wada-ama.org/rtecontent/document/2006_LIST.pdf

70 Roid 4 Sale website (distributor of British Dragon products), http://www.roid4sale.com/products.php?action=product&keyword=dianabol_10mg

71 The 2006 List of Prohibited Substances International Standard, http://www.wada-ama.org/rtecontent/document/2006_LIST.pdf

72 Q 175

73 Q 312

74 Ev 74

75 Q 173

supplements”.⁷⁶ Mr John Scott from UK Sport agreed that “the whole issue of supplements remains a major challenge” and that UK Sport would “love to see an industry standard in the supplements area”.⁷⁷

56. Dr Brewer also told us that the products GSK produces are currently tested at HFL Ltd, one of the UK’s WADA-accredited testing laboratories, to ensure that all of their products are free of substances on the WADA banned list.⁷⁸ However, a “major concern” for GSK at the moment is that there is a suggestion that WADA may remove their accreditation from laboratories testing manufacturers’ supplements. Mr Brewer felt that this “is a very backward step for WADA to be taking” since having such quality assurance for athletes is important.⁷⁹ Professor Ljungqvist from WADA explained the rationale behind the decision to remove accreditation from WADA laboratories testing commercial supplements. He said that if a laboratory tests or is asked to test certain food supplements to determine whether or not they may be contaminated, if the results show that they are not, it is not possible to conclude from that one result that subsequent batches will not be contaminated, and the laboratory may therefore risk issuing false and misleading reports. Professor Ljungqvist said that “we have told the laboratories not to become involved in an area which is so poorly regulated at the national levels”.⁸⁰

57. We firmly believe that it is the responsibility of the individual athlete to determine what is being taken into their own body. However, we also consider it important that an athlete has sufficient assurance on the purity of any non-prohibited substance they may wish to consume. We believe that accreditation of laboratories testing commercial supplements for use in sport provides such assurance to athletes. **We do not believe that it is in the best interest of the athlete for WADA to remove its accreditation from laboratories testing commercial supplements for use in sport. We recommend that the Minister for Sport maintain pressure on WADA to secure the continuing accreditation of laboratories which also test commercial supplements. In addition, we recommend UK Sport take the lead in working with relevant bodies to put in place a certification system for supplements used in sport to regulate against contamination of food supplements and provide assurance to athletes on the purity of what they are taking.**

58. Athletes may also accidentally take a banned substance because they do not realise that such a substance is contained within the Prohibited List. For example, we heard from Dr Hamilton of UK Athletics that athletes may accidentally take ephedrine, a decongestant found in many cold remedies and that “we can all make those mistakes”.⁸¹ We also heard that medical practitioners may not always be aware of the WADA Prohibited List, and the substances and technologies on it, or understand the implications for athletes of using certain substances. John Scott from UK Sport told us that his organisation puts “a lot of effort” into ensuring that there is education material available to doctors to enable them to

76 Q 175

77 Q 63

78 Q 121

79 Q 163

80 Q 310

81 Q 173

make informed decisions with regard to specific athletes who are elite performers.⁸² However, UK Sport's effort in this area may not be sufficient. Dr Bruce Hamilton of UK Athletics told us that what is and is not acceptable for the medical treatment of athletes can be confusing to doctors. He raised the use of glucocorticoids, steroids used to provide relief for inflamed areas of the body. Glucocorticoids may be used to treat joint inflammation, as a corticoid steroid injection or through the mouth, for example in arthritis. Use of glucocorticoids through either of these routes is prohibited without a TUE. However, glucocorticoids can also be taken as a nasal preparation, for example for allergic rhinitis, use of which is which is not prohibited by WADA. Dr Hamilton felt that whether such substances and their routes of administration could be used was sometimes unclear to doctors and that differences in regulation between use of the same substance, for example via different routes, could be "subtle".⁸³ We are concerned that doctors may not always understand what is deemed acceptable treatment for athletes. **We recommend that UK Sport consult upon and review its education material aimed at general practitioners and other medics on the issues faced by athletes, providing further education if this is deemed necessary to clarify WADA prohibited substances and the routes via which such substances may be given.**

82 Q 68

83 Q 190

4 Prevention and detection of doping

The WADA Code

59. Throughout this inquiry we have heard much support for WADA and the WADA Code in the steps it has taken in the fight against doping. Michele Verroken, from the sports business consultancy Sporting Integrity, told us that “the Code has been a major step forward in harmonising certain aspects of drug misuse management across different sports and countries of the world”.⁸⁴ Mr Matthew Reader, representing the DCMS, agreed with this view, stating that “the adoption of the code and the establishment of WADA is a huge leap forward in terms of fighting doping in sport”.⁸⁵ We also heard from Dr Bruce Hamilton of UK Athletics that WADA has “revolutionised” their approach to doping in sport.⁸⁶

60. This level of praise for WADA is impressive, particularly in the light of the stringent conditions sporting bodies must meet in order to become compliant with the requirements of the Code. The sports consultant Michele Verroken believed that “code compliance has significantly occupied the sporting agenda”,⁸⁷ and during our oral evidence session with John Scott from UK Sport, we heard that it is important not to underestimate the difficulty of being code compliant. Mr Scott told us that underpinning code compliance is a “whole raft of operational challenges”⁸⁸ and that “making sure that the rest of the world steps up to the bar is the big challenge”.⁸⁹ UK Sport later told us, on an informal basis, that such challenges revolve around the professional competence and skill of those operating anti doping programmes, for example in relation to the time, education and support required to enable the national governing bodies to become compliant with the Code. One interpretation of this could be that countries with fewer resources should be excused full compliance with the Code. Dr Budgett of BOA, opposed this line and was categorical that the main challenge for individual countries was the need for “government time ... because legislation may have to be changed to be in compliance with the Code ... I do not think that it actually needs resources.”⁹⁰ He pointed out that the Code “does not say how many tests you have to do, it just says the structure you have to have in place and I think it is quite right that compliance is insisted on by WADA and the IOC.”⁹¹ We agree with this view.

84 Ev 84

85 Q 21

86 Q 197

87 Ev 84

88 Q 4

89 Q 90

90 Q 222

91 As above

The Prohibited List

61. Whilst there is clear support for WADA and the WADA Code in general, there are specific concerns regarding the Prohibited List. Debate about what should and should not be allowed in respect of performance enhancement is led by WADA which has the final say on what should be added to the Prohibited List. The criteria upon which WADA makes its decisions have been set out earlier in paragraph 27 of this Report.

62. During oral evidence, we heard from Dr Bruce Hamilton of UK Athletics that there is little “transparency” in the decision-making process with regard to items placed on the Prohibited List. He illustrated this by reference to the recent examination by WADA into whether use of artificial hypoxic chambers as a training aid should be on the list or not. Hypoxic chambers are used by athletes to simulate high altitude conditions and the use of chambers is controversial because it artificially raises red blood cell counts and hence the amount of oxygen which can be carried to the body’s tissues, including muscles. According to Dr Hamilton, WADA found that use of hypoxic chambers was indeed performance-enhancing and that whilst they were not sure whether or not it was dangerous, they felt that it was “against the spirit of sport”.⁹² However, in Dr Hamilton’s words, “at some point behind closed doors it was not put on the list”. He argued that “here is something which WADA have said meets their criteria but for undisclosed reasons has not been put on the list”,⁹³ thereby rendering the decision-making process opaque, to say the least. Similar points were made by Dr Hamilton regarding pseudoephedrine, which is often used as a decongestant in cold and influenza medication. Pseudoephedrine was recently taken off the Prohibited List but has subsequently been shown “to have performance enhancement capabilities”.⁹⁴ It remains unregulated by WADA.

63. When we discussed the issue of hypoxic chambers with Professor Ljungqvist, he explained that WADA conducted an investigation and wide consultation on whether or not use of hypoxic chambers should be banned and that this “resulted in a clear message from our stakeholders not to include it on the List”.⁹⁵ However, Professor Ljungqvist did allude to a “difference of opinion” about this outcome and that members of the WADA ethical panel “felt that it was not in accordance with sports ethics”, whereas “others” felt it was.⁹⁶ On pseudoephedrine, Professor Ljungqvist argued that this was “a minor substance” but that it was now in the process of being reviewed again because “a different scientific argument has come up” regarding the metabolism of pseudoephedrine into cathine, a substance on the banned list.⁹⁷ We are grateful for these explanations but we remain disappointed by the lack of transparency at WADA relating to how decisions regarding the inclusion of substances on the Prohibited List are made. We believe that lack of transparency in the Prohibited List sends out a poor signal to athletes and that WADA should justify each decision made within the criteria which it has itself set. **We urge DCMS and UK Sport to press WADA for clear reasoning to be given for each substance and**

92 Q 186

93 As above

94 Q 126

95 Q 231

96 Q 232

97 As above

method included on the Prohibited List and for its decisions in cases where substances and methods are examined but not banned. As a general rule, we should like to see increased attention paid by WADA to the science behind substances and methods considered for inclusion in the List.

Recreational or social drugs

64. The Prohibited List includes a number of recreational or ‘social drugs’ currently controlled in the UK under the Misuse of Drugs Act 1971 that do not have obvious performance-enhancing capacity. Cannabis is an example of such a substance where some experts such as Professor Hans Hoppeler from the University of Bern believe that use of this drug “is not doping”.⁹⁸ There have been a number of cases of athletes taking recreational drugs, for example, footballers Shaun Newton, who was banned from West Ham for seven months, and Adrian Mutu, who was sacked from Chelsea. During oral evidence, the Minister for Sport, the Right Honourable Richard Caborn MP, told us that he would wish to “look very seriously” at the Prohibited List with a view to removing what he believes are “social drugs”.⁹⁹ The Minister felt that WADA’s role was to root out cheats in sport and to stop athletes using drugs which enhance performance, rather than to be in the “business of policing society”.¹⁰⁰

65. There is disagreement on the effect of social drugs upon performance. For example, Dick Pound, head of WADA, has argued “who’s to say that by taking cannabis in a sport like gymnastics, where there is a fear element, you are not giving yourself an advantage by being more relaxed?”¹⁰¹ **We are concerned at the approach taken by the Government to the use of recreational drugs in sport where they may be performance-enhancing and against the spirit of sport, and we urge the Government to conduct further research to ascertain the possible performance-enhancing capacity of social drugs in sport.**

Therapeutic Use Exemptions

66. During this inquiry, it became clear that there is a perception that the TUE system is subject to abuse. UK Sport told us that they are concerned “about the international consistency of the application of TUEs”.¹⁰² Indeed, there are claims that some sports show an unduly high proportion of TUE registrations, for example, cycling where use of asthma-treating steroids, such as salbutamol, is supposedly widespread. Professor Ivan Waddington (from the Centre for Research into Sport and Society at the University of Leicester) gave a lecture at University College Chester in April 2004 in which he referred to “concern surrounding the fact that, among elite international athletes today, the claimed incidence of asthma is several times higher than that in the general population”. He went on to argue that “there is no obvious medical reason why this should be the case” and that “the suspicion must be that the widespread diagnosis of asthma among elite level athletes is

98 Ev 97

99 Q 321

100 Q 320

101 “Minister under fire over ‘soft’ drugs call”, 12 December 2006, [http://www.politics.co.uk/news/domestic-policy/drugs/cannabis/minister-under-fire-over-soft-drugs-call-\\$460912.htm](http://www.politics.co.uk/news/domestic-policy/drugs/cannabis/minister-under-fire-over-soft-drugs-call-$460912.htm)

102 Q 49

part of a common strategy to avoid the normal sanctions associated with the use of performance-enhancing drugs of the kind which are used in some forms of anti-asthma medication”.¹⁰³

67. This view is by no means universally held. During oral evidence, we heard from both Dr Budgett of the BOA and Professor Ljungqvist of WADA and the IOC that the level of asthma incidence in UK athletes, which is at approximately 20 per cent, is directly comparable with that of the rest of the population.¹⁰⁴ Dr Budgett also gave his personal opinion that since “we in this country are the most efficient at filling out these abbreviated therapeutic use exemption forms in the British team, we have a reputation of having a much higher incidence of asthma than other Olympic teams”.¹⁰⁵ However, when asked by the Committee if he was confident that, for elite athletes, every TUE for drugs used in asthma is because exercise-induced asthma is proven, Professor Ljungqvist answered in the negative.¹⁰⁶ Furthermore, Professor Ljungqvist informed us that it was because of such concerns that the “IOC decided as from the Salt Lake City games to conduct their own investigations and not accept therapeutic use exemptions issued by other bodies”.¹⁰⁷

68. It is the abbreviated TUE process which has led to most concern. Dr Budgett of the BOA argued that TUEs “should all be considered therapeutic use exemptions, not abbreviated therapeutic use exemptions” and that an abbreviated TUE “is just a rubber stamp and is a complete waste of everybody’s time”.¹⁰⁸ He believed that “we should get rid of abbreviated therapeutic use exemptions” and “decide whether we really want people to prove that they have whatever the condition is and that they need the medication”.¹⁰⁹ Whilst we are not convinced that the TUE system is necessarily subject to widespread or systematic abuse, we are concerned that there is potential for such abuse. **We recommend that UK Sport press WADA for abolition of the abbreviated TUE system, and that UK Sport ensure that all TUEs in the UK are awarded on the basis of sufficient evidence that an athlete requires the medication for which the exemption has been awarded.**

Testing for use of illegal HETs

Intelligent testing

69. UK Sport conducts most of its tests out-of-competition, with allocation increasingly governed through the concept of ‘intelligent testing’. We applaud UK Sport for its efforts to identify time-points at which an athlete may be more likely to take illegal HETs. However, there appears to be scope for greater understanding of how banned substances work and when they need to be taken for best efficacy. We have seen little evidence that UK Sport is working with scientists to gain understanding of the effects and pharmacokinetics of

103 Anti-doping policy. A lecture delivered by Professor Ivan Waddington at University College Chester, 19 April 2004, <http://www.chester.ac.uk/ccrss/pdf/doping.pdf>

104 Q 238–240

105 Q 238

106 Q 243

107 As above

108 Q 246

109 As above

banned substances. Such information could include ascertaining when an athlete would need to stop taking a banned substance for it not to be detected during a competitive event, and thus could further enable testing at time-points when an athlete would be most likely to be using it. **We recommend that UK Sport further develop its research programme into the science behind doping and that it apply understanding of the effects and pharmacokinetics of banned substances to its testing programme to help further identify optimum testing time-points for doping in sport.**

70. WADA has testing agreements in place with, for example, the IOC and recognized International Federations. WADA conducts mainly out-of competition testing, focused on athletes competing at the international level (although it may also test national level athletes). A WADA priority is to test athletes who may not otherwise be subject to testing, for example those living in areas of the world without a national anti-doping programme. Rather than using random selection to pick all athletes to be tested, WADA claims that it has also adopted a scientific approach and selects a significant proportion of athletes based on factors such their recent performance, history of doping, and vulnerability to the temptation to take performance enhancing substances.¹¹⁰ WADA also participates in a taskforce with the IOC to ensure global testing prior to and during Olympic Games.¹¹¹

71. There is some concern with respect to international testing programmes. John Scott from UK Sport told us that he thinks “it would be fair to say there are a large number of tests internationally that are basically wasted because they are never going to catch someone who is doping in the way they are applied”. He added that “one of the agendas that is very much being debated internationally now is that it is not just about doping numbers, the test numbers that you do, it is about the effectiveness of those testing numbers”.¹¹² It is essential that there should be clear consistency between WADA and IOC and national testing programmes. We consider that UK Sport has an important role to play in sharing experience and knowledge of best practice built up through its own ‘intelligent testing’ programme. **We recommend that UK Sport work with WADA to help further develop WADA’s testing regime and increase the chance of catching athletes who are guilty of doping.**

Urine versus blood sample

72. Most of the testing undertaken by WADA (individually and on behalf of the IOC) and, on a national basis, by UK Sport is via urine samples. Professor Ljungqvist told us that “urine is by far the best bodily specimen to use for the purpose of anti-doping analysis” because substances that are contained on the Prohibited List are usually eliminated via urine.¹¹³ He was supported in this view by Bruce Hamilton of UK Athletics who pointed out that “there is no point in taking blood if we do not have an appropriate test”.¹¹⁴ Other

110 2005 Wada Out-of-Competition Testing Program, http://www.wada-ama.org/rtecontent/document/DOPINGCONTROL_2005_OOCT_Q&A_EN.pdf

111 World Anti-Doping Agency Programs, http://www.wada-ama.org/rtecontent/document/Presskit_WADA_Programs_en.pdf

112 Q 11

113 Q 239

114 Q 193

witnesses disagreed. For example, Professor Ian McGrath of the University of Glasgow told us that “there is an awful lot more in blood than there is in either saliva or urine”.¹¹⁵ With reference to the national testing programme, Michele Verroken of Sporting Integrity argued that the “UK’s testing programme must include routine testing of blood which is a basic pre-requisite for detection of certain prohibited substances and methods, such as growth hormone and EPO”.¹¹⁶ **Whilst we accept that most testing is satisfactorily carried out through urine, we are of the view that increased research may be needed to determine the most appropriate testing route for different prohibited substances and we urge the Government to consider supporting studies of this nature. In the meantime, we urge UK Sport to increase its programme for testing blood samples since this may facilitate more detailed testing for prohibited substances, either in the present or future** (see below).

Detecting the undetectable

73. In respect of the samples taken for testing, Bruce Hamilton of UK Athletics argued that “the challenges for us are developing tests for detection of substances that currently cannot be detected”.¹¹⁷ Certainly, it is problematic that some illegal HETs are currently undetectable. For example, as detection of erythropoietin, used to increase numbers of red blood cells and hence oxygen carried to body tissue, has become more advanced, athletes have reverted to blood doping to enhance their oxygen-carrying capacity. Increased use of blood doping, e.g. through autotransfusion, the process of drawing blood from an athlete, storing it until they have replenished their natural blood supply and then putting it back in thus increasing the red blood cell count, presents real problems for detection programmes. UK Sport explained that “an athlete growing and using their own blood makes it impossible to detect if the levels are below those reported for an adverse analytical finding”.

¹¹⁸

74. Since 2001 WADA has committed more than US \$28 million to scientific research as part of its commitment to increasing the volume of research dedicated to developing new and improved detection methods for performance-enhancing substances and methods. UK Sport has also committed itself to a long-term research programme in which detection of doping is key. These efforts are being co-ordinated through what UK Sport described as a well-established partnership between itself, the WADA-accredited laboratories and universities conducting anti-doping research.¹¹⁹

75. We applaud WADA and UK Sport for their support of research into the development of new detection techniques. One improvement that could be made quite easily, however, would be the retention of B samples where a positive result is not found. These are currently destroyed but if they were to be retained pending the development of new

115 Q 193

116 Ev 87

117 Q 185

118 NB. In this case the term ‘adverse analytical finding’ is used as a measure of normal red blood cell concentration. Under the WADA code, a sample presenting with a concentration exceeding normal physiological levels would be deemed positive for use of a banned substance. 2006 List of Prohibited Substances, http://www.wada-a.ma.org/rtecontent/document/2006_LIST.pdf

119 Ev 62

detection methods, athletes using a banned but currently undetectable HET could be identified at a future date, thus increasing the detection rate and adding to the deterrent effect. **We recommend that UK Sport and WADA increase storing of data and samples to allow re-evaluation and analysis of test samples once more sophisticated detection methodologies have been developed.**

76. Whilst on a Committee visit to Australia to investigate some of the issues raised in this inquiry, we learnt that the idea had been mooted that all athletes should compete internationally in the year prior to participation at the Olympics Games in order to be eligible for selection. The argument behind this suggestion is that it would enable determination of athletes' baseline performance, potentially making it easier to detect whether doping has occurred since unusual increases on this performance would raise suspicion. We believe that this policy is worth serious consideration and that adopting it unilaterally in this country would send a clear signal that the UK is 'playing fair' and thus set a good example to the rest of the world, in the important lead-up to the 2012 Olympics. **We urge UK Sport to consider the value of implementing a policy in which all UK athletes would be obliged to compete internationally in the 12 months prior to the 2012 Olympics in order to be eligible for participation in the games, with exemption given where appropriate, for example in cases of serious and proven injury.**

UK anti-doping programme

77. UK Sport considers that, with the support of DCMS, it has implemented "a world class anti-doping programme of prevention, deterrence and detection".¹²⁰ We sought evidence to support this claim. DCMS support for UK Sport takes the form of monitoring its performance on a formal basis and regular contact with UK Sport about a range of issues in the drug-free sport area.¹²¹ However, the resource offered in-house at DCMS for anti-doping is extremely limited. Matthew Reader, representing the Department, told us: "effectively I have one member of staff working on anti-doping in sport".¹²² Although he accepted that it would be "foolish" of him to say that more staff would not be helpful, he felt that if a broad look was taken over what the UK is achieving, and given UK Sport's 'world-class' delivery of the anti-doping policy, he could not "think of anything" in terms of additional work that the DCMS could do with additional staff.¹²³ This may be the case but we are concerned at the lack of resource given to anti-doping within Government. Whilst limited staffing may not be a problem in the current situation, there may be increased requirement for Government involvement in the lead up to, and during the London 2012 Olympics. **We recommend DCMS evaluate whether the resources allocated to anti-doping within its own department are sufficient, and whether they will be so by 2012.**

78. UK Sport boasts that it "is one of the world's leading national anti-doping organisations" and that in comparison with its peers, it is "one of the best".¹²⁴ When asked

120 Ev 62

121 Q 2

122 Q 9

123 Q 10

124 Q 3

on what basis this declaration was made, its director, John Scott, told us that it related to the speed at which UK Sport had been able to respond to the WADA Code in its early days and to receive WADA's endorsement for the UK's approach to the application of the Code. UK Sport had been "one of the first NADOs to receive that".¹²⁵ Pushed further to provide evidence that UK Sport is 'world-class', UK Sport then told us that the Committee should not underestimate the difficulties with being compliant with the WADA Code and that UK Sport was "one of the few" National Anti-Doping Organisations with ISO accreditation for its processes. We also heard, again from UK Sport, that it has "one of the best" accredited processes for training its doping control officers who are responsible for taking test samples from athletes.¹²⁶

79. Dr Budgett of BOA supported the claims made by UK Sport for its own effectiveness, stating that it was not "perfect" but it was "getting better" and was "definitely one of the world's leading anti-doping organisations".¹²⁷ On the other hand, the evidence received from Michele Verroken of Sporting Integrity expressed concern about UK Sport organisation and certain of its activities, for example, the quality and nature of its testing programmes.¹²⁸ There is also the question of how UK Sport collects information and analyses testing data. In its report, *Drugs and role models in sport*, the Culture, Media and Sport Select Committee commented that the information collection and analysis relating to drugs in elite sport was, at that time, "unsatisfactory".¹²⁹ The Government responded that "UK Sport, in recognising the need to improve collection and manipulation of the data to undertake more sophisticated analysis, is developing a new computer system to help achieve this".¹³⁰ However, Ms Verroken told us that "much of the data published is incomplete, indicating only tests collected and analysed". She went on to say that "improvements to the accuracy and adequacy of test data would give greater public assurance that a sufficient testing programmes are being delivered".¹³¹

80. Whilst we accept that UK Sport has made progress in the fight against doping, we found their attitude towards their own performance rather complacent, particularly with regard to apparently unsupported claims that they are "one of the best". **We recommend that, rather than arrogate to itself a world-wide leading position, UK Sport operate a continuous review process to ensure current and future success of the UK anti-doping programme. This review process should include monitoring whether the rules are understood and applied consistently across all sports in the UK.**

125 Q 3

126 Q 4-5

127 Q 268-9

128 Ev 87

129 HC [2003-04] 499-I, para 56

130 *Government Response to the Culture, Media and Sport Select Committee Report on Drugs and Role Models in Sport: Making and Setting an Example*, Session 2003-2004, Cm 6347, p5, <http://www.culture.gov.uk/NR/rdonlyres/69FEBA89-AAACE-4595-AB2B-B5836DC6CC48/0/990835Cm6347GovResponse.pdf>

131 Ev 87

Education

81. In 2005 UK Sport launched the *100% Me* programme, designed to promote the clean sporting success of athletes. UK Sport told us that *100% Me* provides a platform for current British athletes to demonstrate that there is no need to use drugs in sport to be successful; ensures that members of the sporting community can access the information and advice necessary to make well informed choices about anti-doping; and minimises the risk of inadvertent doping (through better education of what is and isn't banned).¹³² UK Sport claims that *100% Me* is "widely recognised, by WADA among others, as a world leader in terms of athlete education".¹³³

82. Despite the efforts of UK Sport, it has been suggested that more could and should be done to educate about potential harm from using HETs. During a seminar held to launch this inquiry, we heard from the Olympic gold medal winner Linford Christie OBE that the UK Government should be doing more to educate about the harm HETs could do. For example, he wondered whether information on this area could be included in sports science degree studies and also thought that school education should feature more information on illegal HETs.¹³⁴ In response to the suggestion that the National Curriculum could have a role to play in educating about HETs, Allison Holloway from UK Sport told us that "there is quite a lot in the current curriculum at the moment that focuses on education around the misuse of drugs" and that within GCSE Physical Education there is a focus on anti-doping.¹³⁵ However, we also heard from Ms Holloway that the "real problem" that lies in schools at the moment is that the "teachers do not necessarily know how to deliver on this subject".¹³⁶ We believe that anti-doping education should be targeted at all athletes from an early age and that UK Sport has an important role to play in delivering this agenda. **We recommend that UK Sport work with schools to develop an effective mechanism for educating about the harm which doping in sport can cause.**

132 Ev 60

133 As above

134 Information from HET Seminar, 21 June 2006.

135 Q 71

136 As above

5 Investigation and prosecution of doping

Conflicts of interest

83. UK Sport not only runs the UK anti-doping programme but is the government agency responsible for maximising British success, for example, in the Olympic Games. This is not the case in all other countries. The Australian Government, for example, has developed a distinct body, the Australian Anti-Doping Authority (ASADA), to take samples for testing against use of illegal HETs and to investigate and prosecute in cases of doping. On our visit to Australia, we found ASADA an impressive organisation in which there was a clear dedication to the fight against doping. It was also clear to us that ASADA has gained much support from stakeholders in Australian sport, for example the Australian Institute of Sport, the New South Wales Institute of Sport and the Australian section of the Court of Arbitration for Sport, who felt that establishment of ASADA had removed a previous conflict of interest faced by sporting bodies in Australia regarding the prosecution of doping cases. The USA has taken a similar approach in the creation of the U.S. Anti-Doping Agency (USADA).

84. Whether UK Sport is the appropriate body to support the dual roles of running the anti-doping programme and promoting UK athletic success has been considered previously. In March 2003 consultants PMP undertook a review of the role of UK Sport's Drug Free Sport Directorate on behalf of UK Sport and DCMS in March 2003. The review concluded that there was no tangible evidence of unethical behaviour at UK Sport and its report recommended that Drug-Free Sport should remain one of the key functions of UK Sport.¹³⁷ The Culture, Media and Sport Committee also considered this issue within its 2004 inquiry into drugs and role models in sport and concluded that they were not convinced that conflicts of interest between the dual roles of UK Sport were anything other than perceptions. However, the CMS report did recommend that UK Sport “take whatever steps deemed necessary to separate and clarify the twin chains of command within the agency to ensure that any such perceptions are laid to rest once and for all”.¹³⁸

85. Despite the outcome of these previous reviews, the fact that UK Sport operates through this dual role remains of concern to sport stakeholders. For example, the BOA told us that co-location of the UK's anti-doping programme within the same organisation which has the responsibility for the elite sport funding programme continues to be a “contentious issue”.¹³⁹ The BOA argued that “the anti-doping programme should be independent; independent from individual sports, the sports funding agency and political influence” and that “neither the testing, disciplinary and eligibility aspects of the anti-doping programme should be associated with the agency which funds the elite sport system”.¹⁴⁰ From another

137 PMP Review of Anti-Doping, http://www.uk sport.gov.uk/images/uploaded/PMP_6b.pdf

138 HC [2003-04] 499-I, para 79

139 Ev 95

140 Ev 95

perspective, we also heard support from Professor Ljungqvist of the IOC and WADA for separating out investigation and prosecution of doping in sport from sporting bodies.¹⁴¹

86. When asked about potential conflict of interest between the two roles of UK Sport, the Minister for Sport, Mr Caborn, was dismissive, telling us that “we do not believe there are any conflicts there” and that “we have a very robust system in place”.¹⁴² However, in written evidence submitted after his session with the Committee, Mr Caborn referred to an independent scrutiny panel (established in September 2005), whose remit will include taking account of the perception of conflict of interest when making recommendations on UK Sport and which will report annually.¹⁴³

87. The issue of dual functionality is further complicated when consideration of the sanction process for doping offences is taken into account. Whilst UK Sport is responsible for testing athletes, it is the responsibility of the governing body for the individual sport to decide whether a doping offence has been committed and what, if any, sanctions are to be imposed. Dr Bruce Hamilton of UK Athletics, one such governing body, told us that it “is difficult to have your educational supporting body being your prosecuting body”¹⁴⁴ and that he would support separating the two functions.¹⁴⁵ Using the example of his own organisation, he said that “our anti-doping department will one day be the person who is ringing you up to make sure everything is okay and that you have filled out all the paper work and everything is good; the next day they will be shutting all the doors up and letting you know that you are under a sanction”.¹⁴⁶ Professor Ljungqvist supported this view, commenting that he could “see the conflict of interest” in the role of sporting bodies in the prosecution of doping offences.¹⁴⁷

88. There is no substantial evidence to support allegations of contamination or unethical behaviour either from UK Sport or sporting bodies in relation to the overlapping functions they perform. However, we are concerned at the continuation of strong perceptions within the sporting community that such conflicts of interest exist. In this context, we were impressed with the success of ASADA and find it unacceptable that suggestions for a UK equivalent should be automatically dismissed without detailed review of the benefits such an organisation could offer. Whilst there may not be a problem with current management of anti-doping in the UK, this does not mean that best practice has been achieved. **We urge UK Sport and DCMS to liaise formally with ASADA and USADA in order to determine best practice in testing, investigation and prosecution of doping offences. We recommend that a separate body be established to undertake these roles in the UK, independent of UK Sport and the national governing bodies of individual sports.**

141 Q 273–282

142 Q 316

143 Ev 105

144 Q 191

145 Q 192

146 Q 191

147 Q 273

Criminalisation of doping

89. Under IOC rules, whilst athletes may face disqualification for doping offences, they are not subject to legal penalties and within the UK, although some of the drugs taken to enhance human performance are controlled and fall under the Misuse of Drugs Act 1971, many do not. Whilst we understand, as explained by John Scott from UK Sport, that the Government has taken the position that doping “is an issue that should be owned by sport”,¹⁴⁸ we heard from Michele Verroken of the sports business consultancy ‘Sporting Integrity’ that “no mechanism presently exists to follow up findings in the sports drug testing programme with investigations that may lead to prosecutions” under the Misuse of Drugs Act.¹⁴⁹ Going further still, some other countries criminalise the use of performance-enhancing drugs by sportsmen and sportswomen, for example France and Italy where athletes can face criminal sanctions for doping violations.¹⁵⁰ Ms Verroken suggested that “strengthening legislation to allow seizures of steroids and other performance enhancing drugs to be made, as undertaken by the French police around the Tour de France, would also demonstrate the UK’s commitment to control these substances”.¹⁵¹

90. We received a strong recommendation from Professor Arne Ljungqvist, representing WADA and the IOC, that the UK should look at its laws in this area. He explained that in his own country, Sweden, there is a law “specifically directed to the possession, distribution and even use/consumption of doping substances”¹⁵² and that it had been “very helpful” to Swedish sports organisations to have this law in place because it makes it possible for the police authorities to make searches on suspicion. He believed that having this law in place acted as a “very efficient” deterrent of doping,¹⁵³ and that it could be good for the image of sport, citing an instance where suspicions of doping had been raised but had been satisfactorily dispelled by police investigation.¹⁵⁴ Appearing at the same evidence session, Dr Richard Budgett of the BOA offered full support for a similar law in the UK. He felt that this would “send a very strong message”.¹⁵⁵

91. When asked whether the Government is considering criminalising doping in sport prior to the 2012 Olympics, the Minister for Sport was very clear that “we are not and we will not go down that route”.¹⁵⁶ The Minister pointed out that “WADA is there to root out cheats in sport” and it is the Government’s aim to keep “the policing and the development of WADA very much within sport”.¹⁵⁷ Mr Caborn also told us that he felt it important that sport should “deal with its own misdemeanours” and that to criminalise doping in sport

148 Q 89

149 Ev 86

150 Legal Regulation Of Doping In Sport: The Case For The Prosecution, Gregory Ioannidis, LLB, LLM, Barrister, Lecturer in Law & Research Associate in Sport Law University of Buckingham (UK), page 5, <http://buckingham.ac.uk/publicity/academics/articles/ioannidis-irodis.pdf>

151 Ev 86

152 Q 258

153 As above

154 Q 259

155 Q 260

156 Q 323

157 Q 322

would be “disproportionate” to what the Government is trying to achieve.¹⁵⁸ We note the Minister’s immediate dismissal of the suggestion that doping in sport should be criminalised, since we heard opinions that legislation in this area could help in the fight against doping. **We urge the Government to initiate a review of the experience of countries which have put in place laws criminalising doping in sport.**

Sanctions for doping offences

92. Sanctions for doping offences must be in line with the WADA code and may depend on several factors such as the sport’s governing body’s regulations; the class of substance or method found to be used; the number of times the competitor has had a positive test result; and the explanation given by a competitor for the presence of a prohibited substance in their test sample. Depending on the nature of the offence, the governing body may then impose sanctions ranging from a warning to a ban of three months, two years (the standard ban), four years, or even life. The length of ban given is currently being looked at under the review of the WADA Code with the suggestion that the ban for first-time doping offences should be increased to 4 years.¹⁵⁹ Dr Budgett supported an increase in the ban, particularly for Olympic sports. He told us that that “many of us in sport feel it should be four years” as it is “ridiculous if someone can come back and compete in the very next games having been caught the first time”.¹⁶⁰ **We urge UK Sport to recommend to WADA that a minimum four year ban is applied in all incidences of proven doping.**

93. Some governing bodies may also impose financial penalties upon athletes found guilty of doping. In addition, UK Sport told us that the UK is the only country internationally that will not allow continuation of funding for an athlete caught with a serious doping offence and that UK Sport does not “believe it is acceptable at all for anyone who has chosen to take drugs to receive public funding”.¹⁶¹ Another approach is taken in Australia where, under Australian regulation, athletes there are prevented from competing whilst under investigation for doping offences, an action which further prevents any financial or career gain from cheating. Whilst we welcome moves to prevent athletes from benefiting from future financial gains whilst under sanction for doping offences, we do not believe that this goes far enough. We were therefore interested to hear suggestions from Michele Verroken that financial rewards already received should be repaid when a doping offence occurs.¹⁶² Bruce Hamilton agreed with this view, telling us that he thought it would be “more than reasonable” for an athlete to pay such money back.¹⁶³ **We urge UK Sport to consider a mechanism by which athletes would be liable for repayment of all financial gains, perhaps from the point of the last ‘clean’ test they had given.**

94. We are also keen that athletes should be encouraged to disclose sources of doping material and not be allowed back on the competitive circuit until they have done so. We

158 Q 322

159 Notes from WADA Executive Committee meeting, September 2006. Available from the WADA website at: http://www.wada-ama.org/rtecontent/document/Info_Code_Review_ExCo_Sept2006.pdf

160 Q 217

161 Q 12

162 Ev 87

163 Q 196

recognise that there are difficulties in this. Professor Ljungqvist pointed out that “The problem we face over and over again with athletes is that they simply refuse to disclose”.¹⁶⁴ Dr Budgett of the BOA added that there “may be the odd athlete who actually is innocent but has the substance in his urine” and in such circumstances, disclosure would be impossible.¹⁶⁵ However, he concluded that “on balance, it would be a sensible proposal that, before they are allowed back in the sport, [athletes] must tell the doping authorities where they obtained the substances.”¹⁶⁶ **We recommend that UK Sport and sporting bodies consider making it a requirement that athletes should disclose sources of doping before they are allowed to return to competitive sport.**

Resolving disagreement

95. In the UK investigation and prosecution of doping is undertaken by the governing body for a particular sport. However, sometimes disputes may occur between the prosecuting body and an athlete claiming innocence, and in these cases there may be an appeal to the Court of Arbitration for Sport (CAS). Last year, for example, Rugby Union player Wendell Sailor appealed to the CAS following a two year ban for taking cocaine.¹⁶⁷ During our visit to Australia, we met representatives from CAS who told us that athletes, clubs, sports federations, organisers of sports events or even sponsors may refer a case to CAS if they believe a decision, perhaps to ban an athlete, has been made inappropriately.

96. CAS has interlocking agreements with sporting bodies which detail its jurisdiction in disagreements relating to doping and the CAS representatives were keen to impress upon us the importance of ensuring that CAS has appropriate jurisdiction within the UK and EU prior to the London 2012 Olympic Games. We are perturbed that CAS should perceive this to be a potential problem. **We urge the Government to clarify the position regarding the jurisdiction of the Court of Arbitration for Sport for arbitration and mediation of disputes in doping cases which may occur prior to and during the London 2012 Olympics and to take any steps necessary to ensure that appropriate jurisdiction is established.**

164 Q 223

165 Q 224

166 As above

167 “Sailor appeals against drugs ban”, 25 August 2006, *BBS Sport News*, http://news.bbc.co.uk/sport1/low/rugby_union/5285538.stm

6 Keeping ahead of the game

Horizon scanning

97. One of the purposes of this inquiry was to establish which illegal HETs might be in use by the 2012 Olympic Games. Although many prohibited HETs may be found listed and advertised on websites, we wished to explore what is being done to identify additional potential substances and methods. Development of prohibited HETs generally arises from disciplines and areas not necessarily associated with the sporting community, and it is clear that knowledge of what is going on elsewhere in science would be beneficial in understanding potential areas for abuse in sport. For example, the majority of developments in this area appear to follow on from the application of medical research and pharmaceuticals in treatment of medical conditions. Gene doping, for example, stems from the advent of gene therapy, a massive advance in medicine which will hopefully, in the future, be able to save and change the lives of many individuals who currently suffer from irreversible and incurable diseases. Better understanding of medical advances in gene therapy may help identify possibilities for gene doping. Another source of information regarding potential areas of doping is through learning about the types of substances being brought into the UK. Whilst on a Committee visit to Australia we were interested to hear about the relationship the Australian Anti-Doping Agency (ASADA) has built up with the Australian Customs Service. Information is shared between the bodies, for example on substances brought into the country, and this is then used in the identification of potential illegal HETs in sport.

98. As the body directly responsible for anti-doping in the UK, we expected UK Sport to have a good knowledge of the HETs which might pose a threat and to be involved in the development of methods to test for them. However, this was not the case. In response to our call for evidence to this inquiry, UK Sport was obliged to consult with a number of leading experts to identify this information.¹⁶⁸ Whilst UK Sport could be congratulated for the initiative shown in implementing such a consultation process, we find it a matter of concern that the UK's national anti-doping organisation does not appear to scan the horizon on a regular basis and have such information readily at hand in the fight against doping. There is a need for a UK horizon-scanning capacity for developments in doping to be enhanced. This should include monitoring of websites whereby HETs can be easily purchased and liaison with HM Revenue and Customs to establish what substances are currently being brought into the UK which may be used to illegally enhance performance, either now or in the future. There is also a need for better scanning of current developments in other scientific disciplines (for example, genetics) to determine potential future illegal HETs. **We recommend that the Government establish effective means of monitoring and evaluating potential areas of threat from doping prior to the London 2012 Olympics. We recommend that this responsibility be given to the new organisation in charge of testing, investigation and prosecution of doping offences, distinct from UK Sport, as recommended earlier in this Report.**

Research into illegal HETs

Identification

99. During this inquiry, witnesses have identified several HETs which might pose a threat to the London 2012 Olympics, and we found persuasive Dr Hamilton of UK Athletics who told us of his personal belief that “every component of the WADA code will be challenged over the next ten to fifteen years”.¹⁶⁹ Drugs are an example of such HETs since, as we heard from Professor McGrath of the University of Glasgow, “pharmacology will always develop; drugs are continuously developing, they have been for the last fifty years and that will carry on”.¹⁷⁰ Pharmaceuticals of interest to the sporting world may include stimulants which act on the central nervous or cardiovascular systems, perhaps in raising aggression, confidence or alertness. A well known example of a ‘designer drug’ is Tetrahydrogestronone (THG), an anabolic steroid modified so as to make it undetectable under normal drug testing. THG was discovered following the 2003 US-based Bay Area Laboratory Co-operative (BALCO) investigation¹⁷¹ which resulted in the British 100 metre sprinter Dwain Chambers, amongst others, receiving a two-year ban.¹⁷²

100. Hormones may also pose a threat to fair play during the London 2012 Olympics. Examples include Human Growth Hormone which can aid recovery from injury, promote strength and burn fat, or the glycoprotein hormone erythropoietin (EPO) which regulates red blood cell production and hence the oxygen-carrying capacity of the circulation,¹⁷³ as described below. Dr Hamilton from UK Athletics told us that, for endurance sport at least, EPO will “continue to be a problem through 2012”.¹⁷⁴

101. Blood doping is thought by some, for example Dr Richard Budgett of the BOA, to be a serious concern for anti-doping by 2012.¹⁷⁵ The term ‘blood doping’ refers to the practice of boosting the number of red blood cells (RBCs) in the circulation in order to enhance performance in endurance events by increasing the RBC content and therefore the oxygen-carrying capacity of the athlete’s circulatory system, for example to the muscles. Blood doping is commonly undertaken through the intravenous infusion of blood. The infused blood may have been previously removed (from the same athlete) and stored or it may come from another source.¹⁷⁶ As the detection and understanding of EPO (which has a similar effect, see above) has become more advanced, athletes have reverted back to blood doping, presenting real problems for detection programmes since as explained by UK Sport, “an athlete growing and using their own blood [is] impossible to detect if the levels are below those reported for an adverse analytical finding”.¹⁷⁷

169 Q 185

170 Q 125

171 “This Is Very Clever Chemistry”, *Washington Post*, 4 December 2004, <http://www.washingtonpost.com/ac2/wp-dyn/A33774-2004Dec3?language=printer>

172 Ev 58

173 Ev 59

174 Q 165

175 Q 230

176 Ev 59

177 As above

102. Gene doping, or the modulation of an athlete's genetic material or its expression to improve performance, is also thought of as a potential threat to the London 2012 Olympics. WADA is taking the issue very seriously: it has convened conferences to discuss gene doping with top experts and is supporting research into its detection.¹⁷⁸ Genes of interest to the sporting world could include those involved in increasing production of naturally occurring substances such as Insulin-like Growth Factor-1 (IGF-1) which stimulates muscle growth and speeds healing and repair. This form of doping would also be potentially useful to athletes looking to use alternative effects on genes such as causing them turn on or off as required to enhance performance. Whilst we have also heard that genetic manipulation of athletes is unlikely to be attempted before 2012, (for example, Dr Wackerhage of the University of Aberdeen told us that such use is unlikely because "it is technically difficult and the type of desired and side effects are unclear"¹⁷⁹), there have already been reports of use of gene therapy in this fashion. For example, Repoxygen is the tradename for a type of gene therapy which induces controlled release of EPO in response to low oxygen concentration in mice. Developed to treat anaemia, Repoxygen is still in preclinical development and has not been extensively tested in humans. However, despite being prohibited both in and out of competition under the WADA Code 2006 Prohibited List, interest in Repoxygen is currently suspected.¹⁸⁰

103. We were interested to establish what is being done to identify new performance enhancing drugs. However, John Scott told us that UK Sport were not "directly doing any work" and their research "priority" has been on social research,¹⁸¹ used to get a better understanding of the 'mind-set' of athletes and hence when they might use prohibited substances, rather than what may be available. Mr Matthew Reader from DCMS put the onus on WADA, explaining that it has a "fairly considerable" research budget and that it commissions research around the world. He commented that WADA is "uniquely placed to co-ordinate" since this is one of many issues which has application across the world.¹⁸² We find the attitude of DCMS and UK Sport somewhat complacent, and are concerned that UK Sport does not conduct research into current or future, potentially prohibited, HETs. We also consider that there is a need for increased research into the detection of current and potential illegal substances, including gene doping, and that such research must take place well in advance of the London 2012 Olympics to enable us to be ahead of, or at least on a par with, the cheats. **We recommend that DCMS and UK Sport develop a funding stream to support research into potentially prohibited substances and methods for their detection. We recommend that funds be made available for this work well in advance of the London 2012 Olympics.**

Alternative methods for catching the cheats

104. As discussed in Chapter 4, WADA supports scientific research into the detection of doping in its various forms and it is clear that some mechanisms for cheating (for example,

178 WADA publication, 'Play True', Issue 1, 2005, pages 3-6.

179 Ev 72

180 "Apocalypse now: fears of gene doping are realised", *The Times*, 2 February 2006, <http://www.timesonline.co.uk/article/0,,4-2020875,00.html>

181 Q 31

182 As above

with testosterone) are detectable through the WADA-accredited laboratory testing system.¹⁸³ However, as we have seen above, some HETs remain very difficult or impossible to detect. Since not all methods for doping are currently detectable, the development of the doping, or athlete's, 'passport' has been suggested. The idea behind this suggestion is that athletes would be requested to give blood and urine samples at set points at the start of and during their career in sport. These samples would be tested and analysed, for example for natural variation in hormone levels (such as natural levels of EPO) and markers of normal blood physiology (such as haemoglobin, the part of red blood cells responsible for carrying oxygen). The passport would then be used to measure variation in these levels and thus enable easier tracking of substance abuse. During the course of this inquiry, we have heard strong support for the development of a doping passport. Professor McGrath referred to what he considers the "big case" for an athlete's passport. He also felt that monitoring athletes in this way might enable detection later on when a particular method of doping is not yet detectable.¹⁸⁴ Dr Budgett of the BOA argued that not only is it a "good idea" but that resources put into the development of a doping passport would be effective and that the UK should show a lead because "it would be one extra way of making sure our athletes truly are clean".¹⁸⁵ On the other hand, while John Scott from UK Sport also felt that it would be useful to have a doping passport,¹⁸⁶ he believed that the scheme "requires international partnership" since there is little point in it being applied to just one group of athletes.¹⁸⁷

105. We believe that a 'passport' used to record an athlete's physiological profile over set time points during their career would be of use in the fight against doping. Not only might such a scheme offer increased potential for detection of doping, but it could act as a deterrent to those athletes contemplating doing so. However, for such a passport to be effective, it would be necessary for anti-doping authorities to have a clear, continually developing understanding of normal physiology (for example, of the blood) and the effects of HETs upon it. There may therefore be a need for increased research into normal physiological characteristics to enable detection of when doping has occurred. **We recommend that the UK pilot the development of a doping passport and that government funds be made available for development of this scheme. To support this, we recommend that funding be given for research into normal physiology and changes in physiological characteristics after doping with illegal substances.**

183 Testosterone, epitestosterone and the doping tests, Cycling News, 31 July 2006, http://www.cyclingnews.com/news.php?id=features/2006/testosterone_testing

184 Q 193

185 Q 304

186 Q 73–79

187 Q 83

7 Preparing for the 2012 Olympics

Scaling up testing

106. A recently released IOC statement announced that, as part of its zero tolerance approach to fighting doping, the number of tests conducted for the Beijing Olympic Games will be significantly increased. Final numbers are to be confirmed but are expected to be around 4,500, a 25 per cent increase on Athens 2004.¹⁸⁸ It might therefore be reasonable to assume the possibility of further increases by 2012 and the London Games. Indeed, according to Professor Ljungqvist, the IOC is steadily increasing the number of tests for the Olympic Games from each one to the next and he was certain that “they will be increased again”.¹⁸⁹ Dr Budgett of the BOA suggested that 5,000 tests would be “a nice rounding of the figure”, which “would be half of the athletes at the games”.¹⁹⁰

107. If testing is to increase during the 2012 Olympics, then it is clear that the UK must have a strategy in place underpinning the requirements this may impose. During our visit to Australia, the Committee learnt that the Australian Government awarded significant funding to enable the Australian Sports Drug Testing Laboratory (ASDTL) to expand in preparation for the testing of all samples taken during the Sydney 2000 Olympics. The ASDTL called on equipment and personnel (the ASDTL expanded from 14 to 90 members of staff during the games) from other sections of the National Measurements Institute where it is based, and was able to ensure that all involved in the testing process were fully trained.

108. In the light of this experience, we were concerned at the apparent complacency shown by UK Sport and the Government in respect of this issue. When asked how UK testing laboratories would scale up for testing at the 2012 games, John Scott from UK Sport acknowledged that there may be a huge increase in the number of tests but he did not think capacity would be a problem, telling us that “it is very easy to bring in the sophisticated testing machinery” and that “there are a number of individuals who are qualified to use that machine internationally who would also be brought in”.¹⁹¹ It is a standard procedure during the Olympics that staff from WADA-accredited laboratories from across the world congregate in the host country to assist in the testing process. This is reassuring but we were less satisfied with Mr Scott’s admission that this “is part of the pre-Games planning that we are only now beginning to get our heads around”.¹⁹² The question of funding for the necessary increase in facilities also seems unresolved. When pressed on whether the UK Government would be making funds available, the Minister for Sport, Richard Caborn MP told us that this was “not a UK responsibility or indeed a Government responsibility” but one within the domain of the London Organising Committee of the Olympic Games and

188 27 October 2006, *The Herald*

189 Q 263

190 Q 302

191 Q 47

192 Q 48

Paralympic Games (LOCOG). Mr Caborn also told us that funding for the London 2012 testing programme itself would have to come out of the LOCOG budget.¹⁹³

109. Whilst 2012 may seem some way off, we believe that it is essential that the UK takes a proactive stance on developing the facilities required for a successful testing programme. We also believe that an accurate view of funding requirements must be obtained and that adequate funding for the running of a successful testing programme must be made available. **We recommend that UK Sport and DCMS urgently consult on requirements for scale-up of testing facilities, personnel and protocol during the London 2012 Olympics and that Government funding for meeting such requirements be made available. This will clearly require close working with LOCOG and to facilitate this, we urge the Government to provide a clear statement on the responsibilities and remit of LOCOG and UK Sport regarding the London 2012 testing programme.**

Liaison

110. We were also interested to determine what mechanisms the UK has in place to learn from previous large-scale events such as the Beijing 2008 Olympic Games. John Scott from UK Sport told us that “WADA undertakes an independent observer programme for all the games”.¹⁹⁴ He added that UK Sport will be studying WADA reports, for example on Turin (host of the 2006 Winter Olympics) and Melbourne (host of the 2006 Commonwealth Games), and that it will be working with LOCOG in terms of “delivery of the anti-doping programme”.¹⁹⁵ There are two options in terms of how this Olympic anti-doping programme will be delivered (either by UK Sport directly, or with UK Sport as advisers for the delivery), and Mr Scott explained that the selected option would “gear up accordingly”.¹⁹⁶ Anti-doping will come within the remit of a medical director for the London Games who is yet to be appointed, although Mr Scott indicated that UK Sport expects to “be there as well observing anti-doping at the [Beijing] Games”.¹⁹⁷

111. Once again, we find the attitude of UK Sport unacceptably complacent. Whilst it might not be expected that the 2012 Olympic anti-doping policy should already be in place, we are concerned that little is being done to liaise with and learn from previous hosts of the Olympics and other major events. **We recommend that immediate mechanisms be put in place by UK Sport to learn how other countries have managed doping during large international sporting events. We recommend that the Government liaise actively with WADA, IOC and other governments to ensure that the UK is not only well prepared for anti-doping during the 2012 Games, but that there is a clear understanding of the protocols the UK must have in place.** This process of learning lessons from the experience of others will be vital to the success of the 2012 Games but we are also concerned that more needs to be done, and more quickly, to ensure that the UK can deliver the most efficient anti-doping and testing programme possible. **We recommend that the Government**

193 Q 325–327

194 Q 59

195 As above

196 As above

197 Q 59–61

develop an action plan in conjunction with UK Sport to ensure that the UK is prepared for anti-doping well in advance of the 2012 Games.

112. During our visit to Australia, we learned about the importance of gaining knowledge of prohibited substances which may be brought into the country, either legally (if not banned under UK legislation) or illegally, prior to the London 2012 Olympic Games. Representatives of the Sydney branch of the Court of Arbitration for Sport impressed upon us how essential it is that a robust relationship is built between anti-doping authorities and HM Revenue and Customs prior to the lead-up to the 2012 Olympics. We agree that this is an area for serious consideration. **We recommend that mechanisms be put in place for informed liaison between UK Sport or any replacement anti-doping authority and HM Revenue and Customs to identify and monitor prohibited substances brought into the UK which may be intended for use during the 2012 Olympic Games.**

8 Being the best legally

Use of legal HETs

113. Within the context of this inquiry, we were keen to evaluate some of the legal mechanisms by which UK athletes can be supported in their pursuit of sporting success. We have learnt of a number of technologies available which are believed, or have been proven, to have performance-enhancing capacity, for example:

- a) Biomechanics, used to enhance performance by improving understanding of the mechanics of movement. We were interested to see use of biomechanics for the improvement of bowling technique in cricket at the Australian Institute of Sport and for aiding in the development of twists and jumps in gymnastics and trampolining at Loughborough University.
- b) Immunology. The physical and life stresses associated with high level competition can result in immune suppression leading to increased susceptibility to minor infections and illnesses. Understanding of immunology and the specific requirements of athletes is therefore beneficial, and we were interested to see some of the research ongoing at Loughborough University into the development of nutritional and other strategies to combat the physical requirements of an athlete's life.
- c) Nutrition and hydration. Good nutrition and hydration practices can be used to boost performance levels and also aid in the recovery of muscle function after intensive training or injury.¹⁹⁸
- d) Physiology. Better understanding of general physiology and the effects of intensive training upon it may be beneficial in learning how to enhance performance through legal mechanisms.¹⁹⁹

114. Dr Anna Casey, representing QinetiQ, told us that one must accept that athletes will take supplements and that “some supplements are legal, they are worth taking and they will aid training, they will aid recovery”.²⁰⁰ We also note that the IOC Medical Commission accepts use of some supplements. Professor Ljungqvist told us that “as long as the mechanisms that they are using for performance enhancing are accepted and not banned, it is automatically okay”.²⁰¹ However, we were also told that it is important to proceed with caution before recommending use of legal HETs. Dr Budgett from the BOA told us that he is “cautious and sceptical” about HETs. Dr Budgett explained that “there are an awful lot of methods and substances out there that are put forward with pseudo-scientific justification” and that he is sceptical with regard to whether or not such HETs have beneficial effect.²⁰² He gave his opinion that required supplements will normally be for a medical reason and

198 Ev 70–71

199 As above

200 Q 175

201 Q 306

202 Q 306

under direction from a professional, for example, nutritionist or doctor,²⁰³ a view shared by Professor Ljungqvist who told us that athletes should not take anything unless they can prove that they need it.²⁰⁴

115. We believe that legal HETs may be of real value to performance enhancement. However, we accept that caution is required in the use of such substances and methods and believe that athletes must have access to appropriate medial advice and support to ensure that they are using legal HETs correctly. **We should like to see a culture of ‘openness’ developed and maintained in which athletes can easily access help and advice in situations where use of legal HETs may be appropriate. UK Sport should take the lead in fostering this approach through its links with the national sporting bodies.**

Development of legal HETs

116. If we are to help our athletes improve their performance through use of legal HETs, then it is important that there is sufficient (and ongoing) research into such technologies. During this inquiry, it has become apparent that there is limited funding for research into legal mechanisms for enhancing performance. Professor Arne Ljungqvist from WADA told us that his organisation does “not feel that is our responsibility” and that the \$5 million research funding available within WADA goes directly into developing methods for the detection of doping substances.²⁰⁵ Neither DCMS or UK Sport fund research into HETs. We were told us in oral evidence that “UK Sport are not directly doing any work ourselves. We have a very small research budget and our research priority has been on social research”.²⁰⁶ In supplementary evidence, UK Sport elaborated that it “does not have responsibility for funding research but instead hopes to enhance its role in influencing the research agenda more widely in this area”.²⁰⁷

117. It is also clear that the skills base underpinning such research, and the research itself, must be of extremely high quality. However, in his written submission, Professor McGrath told us that “much research in sports-related topics is not cutting edge and does not have sufficient scientific depth”²⁰⁸ and that “the skills base (physiology in health and disease, genetics and biochemistry) is there but it is not being directed towards these ends [sports science]”.²⁰⁹ We were also told that the practical skills necessary to build up the sports science research base are not being taught. Henning Wackerhage from the University of Aberdeen argued that “it is unfortunate that the practical skills (i.e. biochemical, molecular biology and genetic techniques) necessary for mechanistic exercise research are not often taught as part of sports and exercise science degrees”.²¹⁰

203 Q 308

204 As above

205 Q 311

206 Q 31

207 Ev 107

208 Ev 96

209 Ev 97

210 Ev 73

118. Sport is an important industry in the UK with a large budget. It is therefore a matter of concern that research into sport-related topics is not considered ‘cutting-edge’ since the increased knowledge and understanding research can produce may be instrumental in maximising our athletes’ performance and hence increasing return on UK investment in sport. We are also concerned that the relevant skills required for such research should be taught. **We recommend that the Government review the quality of sports science research in the UK and implement mechanisms for enhancing training and support where required.**

Academia

119. Whilst there are clear benefits from the use of legal mechanisms for performance enhancement, academic research in this area is limited. Dr Henning Wackerhage of the University of Aberdeen told us that “sports and exercise research is probably less well funded in the UK than in the US or Scandinavia”.²¹¹ During a seminar held to launch this inquiry, we also heard from Professor Maughan of Loughborough University that most of the advances in HET are based in the context of medical research and do not come from sports science. We later heard from Professor McGrath of the University of Glasgow that “there are not the drivers to do the research”.²¹²

120. Reasons cited for such limited academic research into HETs include the lack of incentives for doing so. For example, during the Committee’s visit to Loughborough University, we were told of the reduced incentive for undertaking work to be published specifically in sports science journals. Journal impact factors are a measure of citations to science and social science journals and are frequently used to indicate the importance of a journal to its field. In real terms, the absolute value of an impact factor is meaningless and comparison of impact factors between different fields is invalid. However, such comparisons have been widely used for the evaluation of not merely journals, but of scientists and of university departments. Indeed, during its 2004 report into *Scientific publications: Free for all?*, the previous Science and Technology Select Committee reported the perception that the Research Assessment Exercise “rewards publication in journals with high impact factors”.²¹³ Since impact factors of sports science specific journals are significantly lower than those for other disciplines for example, medical research, there is little incentive for researchers to direct their work in this fashion. For example, whilst the *New England Journal of Medicine* has a current impact factor of 44, the *American Journal of Sports Medicine* has an impact factor of 2.4, the *British Journal of Sports Medicine* an impact factor of 1.85 and *Sports Medicine* an impact factor of 3.33.²¹⁴

121. There is also limited funding available from the public research funding sector into sports science generally and the development of legal HETs specifically. According to Professor McGrath “the remits of the research councils do not include sport” and the “people who do this kind of work tend to drift off in their career into cardiovascular

211 Ev 73

212 Q 118

213 Science and Technology Committee, Tenth Report of Session 2003-04, *Scientific Publications: Free for all?*, HC 399-I, para 210

214 Web of Science - Journal Citation Reports, <http://portal.isiknowledge.com/portal.cgi?DestApp=JCR&Func=Frame>

research or diabetes because they can apply the biological expertise there and get funding”.²¹⁵ It could be argued that this gap in funding for research of this type should be filled by those to whom it would be of immediate benefit, for example sporting bodies and organisations. However, Bruce Hamilton from UK Athletics told us that “it is very rare to commission research, primarily because the sporting bodies do not have funds to do so”.²¹⁶ We are concerned that, despite the Government’s boast that it is “keen to ensure the highest possible standards for sport in this country, and to re-establish the UK as a powerhouse in the sporting world”,²¹⁷ we see little investment in the research which may enable it to do so. We also find it astonishing that sports science as a general discipline receives such little support, particularly in light of clear connections to research within the medical and biological sectors and also as a social science, with relevance to the ethical issues involved with doping in sport. **We recommend that the Research Councils include research into sports science within their funding remits. Furthermore, we urge the coordinating body, Research Councils UK to examine the ways in which sports science could be more effectively served across the Research Councils.**

122. We were interested to see the different approach taken by the Australian Government to research into legal mechanisms for enhancing performance. In contrast to the UK Sport and National Lottery-funded English Institute of Sport, the Australian Institute of Sport (AIS) has an active research funding programme, supported by the Australian Government, covering this area. It runs a research grants programme in which academics can apply for research funds in partnership with a sporting body/institution.²¹⁸ We would like to see research into legal HETs given a higher priority in the UK. **We recommend that the Government develop a specific funding stream for research into legal mechanisms for enhancing human performance in sport.**

Industry

123. The majority of research into HETs, in the UK at least, is conducted by sectors other than that of academia. Industry is a major funder of HET research. Michelle Verroken from Sporting Integrity told us that “in the medical and pharmaceutical industry similar research [to that required to enhance sporting performance] is being undertaken which could be applied”.²¹⁹ Indeed, there are a number of industrial bodies with an interest in sports science; for example, those within the UK sports nutrition market interested in the development of sports foods and beverages which can be a substitute for traditional foods and beverages or sports supplements in pill or powder form, intended to be taken in addition to regular food and drink. Such companies include Lucozade (owned by GlaxoSmithKline) which produces a number of supplements, for example isotonic drinks to aid in rehydration, and GNC which produces a diverse range of supplements from vitamins to protein bars, including those designed to maximise muscle growth.

215 Q 118

216 Q 142

217 Better Sport, http://www.culture.gov.uk/what_we_do/Sport/best_possible_sport.htm

218 <http://www.ais.org.au/research/index.asp>

219 Ev 88

124. John Brewer of GlaxoSmithKline told us the main drivers behind such research were “to look at new claims and to develop new products”.²²⁰ He explained that his company looked to fund research that will enable them to produce products which are different from the range it already has and which will give it “cutting edge products and cutting edge claims that we can make around those products”.²²¹ However, GSK recognised that there is also a need to fund blue sky research “which may not have an immediate effect for us but which may enable us to enhance sports science”.²²² Industry also funds research within the academic sports science sector. Mr Brewer told us that GSK currently has a research budget for sports science which is approximately half a million pounds a year and that this is used to support research in five academic universities, “four in this country and one in Australia”.²²³ However, whilst such funding is appreciated by academics, Professor McGrath pointed out that £500, 000 is typically the amount researchers might expect for a single project and that “there just are not the resources going into this area”.²²⁴ He estimated the need for a substantial amount of money in this area: “£20 million or something like that”.²²⁵

Military

125. The military sector also has an interest in supporting research into HETs and is working to develop products of use to those in the field, for example strategies to maintain hydration levels. In 2005, the Ministry of Defence awarded a £1.5 million three year contract to GSK to produce a Lucozade Sport Body Fuel drink for soldiers’ 24 hour Operational Ration Packs.²²⁶ Anna Casey, a research leader at QinetiQ, told us that, in most cases, “military feeding initiatives are based on developments in sports science”,²²⁷ and that “the Ministry of Defence is putting significant resources into preparing people for operations, preparing people for optimal performance and different environmental conditions using different technologies and different supplements and different ways of optimising performance”.²²⁸ The military sector is clearly undertaking research which would be of interest to those in the sports science field and stronger links between the two sectors might be fruitful.

Knowledge transfer

126. In addition to the limited research undertaken, particularly by the academic sector into legal HETs for sport, there are also limitations on the exploitation of the research

220 Q 119

221 As above

222 Q 119

223 As above

224 Q 131

225 Q 136

226 Liquid Fuel for Armed Forces Ration Pack, 23 September 2005, QinetiQ Press release, http://cache.zoominfo.com/cachedpage/?archive_id=0&page_id=1440978317&page_url=%2f%2fwww.qinetiq.co.uk%2fhome%2fnewsroom%2fnews_releases_homepage%2f2005%2f3rd_quarter%2fliiquid_fuel.html&page_last_updated=2%2f16%2f2006+10%3a11%3a32+AM&firstName=Anna&lastName=Casey

227 Q 116

228 Q 140

which does take place within the different sectors to its maximum potential. Dr Anna Casey described how the pull-through of military research needs to extend to outside the military. She told us that there would be a real willingness from the military sector for this to happen.²²⁹ However, she also observed that interaction between the different sectors “is not as good as it should be”.²³⁰ John Brewer from GSK told us that “whilst we know the key individuals that we are working with, there may be other areas of expertise out there which we are not aware of which could give us the answers to some of the questions which we are raising”.²³¹ We also heard from Dr Bruce Hamilton of UK Athletics that “there needs to be a tighter link between the clinical practice (and I include in that the sports physicians and the coaching arena) and university research”.²³²

127. Although there are a number of conferences for knowledge exchange in sports science (for example, the European College of Sports science annual meeting), one academic in the field, Dr Andy Miah of the University of Paisley, wrote that there is a problem with respect to communication of developments in sports science, which he regarded as “One of the major weaknesses in the world of sport”.²³³ The University of Loughborough supports this view, specifically in respect of the need for better dissemination of information, telling us that “key to the success of HETs in sport is education of athletes, coaches and those who support them. Dissemination of available information has lagged far behind scientific progress: the use of new technologies to improve communication with athletes must be an essential part of any strategy”.²³⁴

128. UK Sport is making efforts to address the issue of communication between the sectors and we understand from Dr Casey that the organisation recently set up a short term working group bringing together academics and industry to produce a document for UK athletes with a view to 2012, on ergogenic aids and supplements and performance enhancement.²³⁵ We also understand the UK Sport, together with the Engineering and Physical Sciences Research Council, has recently held three tailored ‘Achieving Gold’ workshops aimed at bringing together researchers from a variety of backgrounds to look at the application of science, engineering and technology to Olympic and Paralympic performance sport. The first of these workshops ‘Improving information flow’ looks at ways in which coaches can be presented with more ‘real time’ information about how their athletes are performing; the second is designed to look at ‘New ways to test new kit and equipment’; and the third is on ‘Improving our understanding of sails’. The workshops are backed by a potential £1.5m budget to support delivery and outcomes.

129. We welcome initial efforts by UK Sport to enhance the application of science to sport. However, we feel that there is still a long way to go. There is a need for greater awareness of relevant research being undertaken by different academic disciplines (for example, pharmacology, genetics and sports science) and sectors (academia, industry, military,

229 Q 154

230 Q 158

231 Q 157

232 Q 143

233 Ev 65

234 Ev 71

235 Q 158

sporting organisations), with particular need for increased linkage between the industrial and academic sectors. In addition, we are concerned that links between the sports sector and the Ministry of Defence are weak and that significant effort should be made toward application of relevant knowledge within this sector to the benefit of sport. There is also a need for greater translation/application of the research generated by different disciplines and sectors to sport. **We urge UK Sport to develop formal mechanisms for the sharing of knowledge and information between the different sectors and to look at mechanisms for maximising the application of knowledge already in existence to the benefit of sport in the UK. Furthermore, we recommend that the UK Research Councils identify mechanisms for enhancing the sharing of information relevant to sports science between the different academic disciplines.**

9 Conclusion

130. For the size of the industry and the numbers directly engaged in it at a professional level within the UK, sport has a very high public profile and its figureheads are enormously influential, especially amongst young people. Sport matters to people, and both successes and scandals resonate within the community beyond the immediate sporting world. That is why the issue of doping in sport is so important and why it has the potential to turn an occasion for national pride – the 2012 Olympics in London – into an embarrassment and national disgrace. Doping in sport is a worldwide problem but winning the right to hold the Olympics in the UK makes it a pressing issue within this country and one which should command particular Government attention at this time. While we recognise that there is great potential for human enhancement technologies in some forms to be beneficial to sportspeople and the image of sport, it is necessarily the negative connotations which currently have most public impact. We believe that the recommendations set out in this Report would make a vital contribution to ensuring that the issue of doping in sport is handled sensitively and efficiently within the UK in the run up to and during the 2012 Olympic Games.

Conclusions and recommendations

Background

The ethics of doping

1. We believe that ethics are an important consideration in the fight against doping and are concerned that limited attempts are being made to address this issue. We recommend that UK Sport establish a Committee to examine the ethical aspects of doping in sport and advise WADA on possible changes to the consideration of ethical issues within its operations. We also believe that UK Sport and WADA should consider the case for funding research into the ethics of doping. (Paragraph 46)

The culture of doping

Prevalence of doping

2. We recommend that UK Sport commission research into the real incidence of doping both in general and in particular sports in order that the magnitude of the problem may be understood and the means of tackling it may be better defined. (Paragraph 50)

Obtaining banned substances

3. We are concerned at the ease by which banned, and potentially dangerous, substances can be obtained for use by athletes and we recommend that the Government review regulation in this area. (Paragraph 52)
4. We do not believe that it is in the best interest of the athlete for WADA to remove its accreditation from laboratories testing commercial supplements for use in sport. We recommend that the Minister for Sport maintain pressure on WADA to secure the continuing accreditation of laboratories which also test commercial supplements. In addition, we recommend UK Sport take the lead in working with relevant bodies to put in place a certification system for supplements used in sport to regulate against contamination of food supplements and provide assurance to athletes on the purity of what they are taking. (Paragraph 57)
5. We recommend that UK Sport consult upon and review its education material aimed at general practitioners and other medics on the issues faced by athletes, providing further education if this is deemed necessary to clarify WADA prohibited substances and the routes via which such substances may be given. (Paragraph 58)

Prevention and detection of doping

The WADA Code

6. We urge DCMS and UK Sport to press WADA for clear reasoning to be given for each substance and method included on the Prohibited List and for its decisions in cases where substances and methods are examined but not banned. As a general rule, we should like to see increased attention paid by WADA to the science behind substances and methods considered for inclusion in the List. (Paragraph 63)
7. We are concerned at the approach taken by the Government to the use of recreational drugs in sport where they may be performance-enhancing and against the spirit of sport, and we urge the Government to conduct further research to ascertain the possible performance-enhancing capacity of social drugs in sport. (Paragraph 65)
8. We recommend that UK Sport press WADA for abolition of the abbreviated TUE system, and that UK Sport ensure that all TUEs in the UK are awarded on the basis of sufficient evidence that an athlete requires the medication for which the exemption has been awarded. (Paragraph 68)

Testing for use of illegal HETs

9. We recommend that UK Sport further develop its research programme into the science behind doping and that it apply understanding of the effects and pharmacokinetics of banned substances to its testing programme to help further identify optimum testing time-points for doping in sport. (Paragraph 69)
10. We recommend that UK Sport work with WADA to help further develop WADA's testing regime and increase the chance of catching athletes who are guilty of doping. (Paragraph 71)
11. Whilst we accept that most testing is satisfactorily carried out through urine, we are of the view that increased research may be needed to determine the most appropriate testing route for different prohibited substances and we urge the Government to consider supporting studies of this nature. In the meantime, we urge UK Sport to increase its programme for testing blood samples since this may facilitate more detailed testing for prohibited substances, either in the present or future (Paragraph 72)
12. We recommend that UK Sport and WADA increase storing of data and samples to allow re-evaluation and analysis of test samples once more sophisticated detection methodologies have been developed. (Paragraph 75)
13. We urge UK Sport to consider the value of implementing a policy in which all UK athletes would be obliged to compete internationally in the 12 months prior to the 2012 Olympics in order to be eligible for participation in the games, with exemption given where appropriate, for example in cases of serious and proven injury. (Paragraph 76)

14. We recommend DCMS evaluate whether the resources allocated to anti-doping within its own department are sufficient, and whether they will be so by 2012. (Paragraph 77)

UK anti-doping programme

15. We recommend that, rather than arrogate to itself a world-wide leading position, UK Sport operate a continuous review process to ensure current and future success of the UK anti-doping programme. This review process should include monitoring whether the rules are understood and applied consistently across all sports in the UK. (Paragraph 80)
16. We recommend that UK Sport work with schools to develop an effective mechanism for educating about the harm which doping in sport can cause. (Paragraph 82)

Investigation and prosecution of doping

Conflicts of interest

17. We urge UK Sport and DCMS to liaise formally with ASADA and USADA in order to determine best practice in testing, investigation and prosecution of doping offences. We recommend that a separate body be established to undertake these roles in the UK, independent of UK Sport and the national governing bodies of individual sports. (Paragraph 88)

Criminalisation of doping

18. We urge the Government to initiate a review of the experience of countries which have put in place laws criminalising doping in sport. (Paragraph 91)

Sanctions for doping offences

19. We urge UK Sport to recommend to WADA that a minimum four year ban is applied in all incidences of proven doping. (Paragraph 92)
20. We urge UK Sport to consider a mechanism by which athletes would be liable for repayment of all financial gains, perhaps from the point of the last 'clean' test they had given. (Paragraph 93)
21. We recommend that UK Sport and sporting bodies consider making it a requirement that athletes should disclose sources of doping before they are allowed to return to competitive sport. (Paragraph 94)

Resolving disagreement

22. We urge the Government to clarify the position regarding the jurisdiction of the Court of Arbitration for Sport for arbitration and mediation of disputes in doping cases which may occur prior to and during the London 2012 Olympics and to take

any steps necessary to ensure that appropriate jurisdiction is established. (Paragraph 96)

Keeping ahead of the game

Horizon scanning

23. We recommend that the Government establish effective means of monitoring and evaluating potential areas of threat from doping prior to the London 2012 Olympics. We recommend that this responsibility be given to the new organisation in charge of testing, investigation and prosecution of doping offences, distinct from UK Sport, as recommended earlier in this Report. (Paragraph 98)

Research into illegal HETs

24. We recommend that DCMS and UK Sport develop a funding stream to support research into potentially prohibited substances and methods for their detection. We recommend that funds be made available for this work well in advance of the London 2012 Olympics. (Paragraph 103)

Alternative methods for catching cheats

25. We recommend that the UK pilot the development of a doping passport and that government funds be made available for development of this scheme. To support this, we recommend that funding be given for research into normal physiology and changes in physiological characteristics after doping with illegal substances (Paragraph 105)

Preparing for the 2012 Olympics

Scaling up testing

26. We recommend that UK Sport and DCMS urgently consult on requirements for scale-up of testing facilities, personnel and protocol during the London 2012 Olympics and that Government funding for meeting such requirements be made available. This will clearly require close working with LOCOG and to facilitate this, we urge the Government to provide a clear statement on the responsibilities and remit of LOCOG and UK Sport regarding the London 2012 testing programme. (Paragraph 109)

Liaison

27. We recommend that immediate mechanisms be put in place by UK Sport to learn how other countries have managed doping during large international sporting events. We recommend that the Government liaise actively with WADA, IOC and other governments to ensure that the UK is not only well prepared for anti-doping during the 2012 Games, but that there is a clear understanding of the protocols the UK must have in place. (Paragraph 111)

28. We recommend that the Government develop an action plan in conjunction with UK Sport to ensure that the UK is prepared for anti-doping well in advance of the 2012 Games. (Paragraph 111)
29. We recommend that mechanisms be put in place for informed liaison between UK Sport or any replacement anti-doping authority and HM Revenue and Customs to identify and monitor prohibited substances brought into the UK which may be intended for use during the 2012 Olympic Games. (Paragraph 112)

Being the best legally

Use of legal HETs

30. We should like to see a culture of 'openness' developed and maintained in which athletes can easily access help and advice in situations where use of legal HETs may be appropriate. UK Sport should take the lead in fostering this approach through its links with the national sporting bodies. (Paragraph 115)

Development of legal HETs

31. We recommend that the Government review the quality of sports science research in the UK and implement mechanisms for enhancing training and support where required. (Paragraph 118)
32. We recommend that the Research Councils include research into sports science within their funding remits. Furthermore, we urge the co-ordinating body, Research Councils UK to examine the ways in which sports science could be more effectively served across the Research Councils. (Paragraph 121)
33. We recommend that the Government develop a specific funding stream for research into legal mechanisms for enhancing human performance in sport. (Paragraph 122)

Knowledge transfer

34. We urge UK Sport to develop formal mechanisms for the sharing of knowledge and information between the different sectors and to look at mechanisms for maximising the application of knowledge already in existence to the benefit of sport in the UK. Furthermore, we recommend that the UK Research Councils identify mechanisms for enhancing the sharing of information relevant to sports science between the different academic disciplines. (Paragraph 129)

Abbreviations

AIS	Australian Institute of Sport
ASADA	Australian Sports Ant-Doping Authority
BOA	British Olympic Association
CAS	Court of Arbitration for Sport
CMS	Culture, Media and Sport
DCMS	Department for Culture, Media and Sport
EIS	English Institute of Sport
EPO	Erythropoietin
ESSNA	European Specialist Sports Nutrition Alliance
HET	Human enhancement techniques
IOC	International Olympic Committee
LOCOG	London Organising Committee of the Olympic Games and Paralympic Games
NADO	National Anti-Doping Organisations
NGB	National governing body (of sport)
TUE	Therapeutic Use Exemption
USADA	United States Anti-Doping Agency
WADA	World Anti-Doping Agency

Glossary of sports-related organisations

British Olympic Association (BOA)	The BOA is responsible for the United Kingdom's participation in the Olympic Games and gives financial support to athletes.
English Institute of Sport (EIS)	A network of nine regional multi-sport hub sites and satellite centres offering services to athletes.
International Federations (IF)	IFs have a similar role to NGBs. They adopt the WADA code to fit their particular sport's needs and monitor NGB compliance.
International Olympic Committee (IOC)	The IOC is responsible for organising the Olympics Games and for promoting sport at all levels. It determines Olympic testing programmes for drugs.
National Governing Bodies (NGB)	Each sport has a national governing body which supports its members and their interests. NGBs sign up to the rules of the UK anti-doping programme (under UK Sport) and are responsible for investigation and prosecution of doping offences within their sport.
UK Sport	UK Sport co-ordinates sports policy and manages public investment in sport in the UK. In relation to anti-doping, it is the UK's national anti-doping organisation, with responsibility for the implementation and management of the UK's anti-doping programme. It also runs the UK's testing programme, passing positive results to the relevant NGB or IF.
World Anti-Doping Agency (WADA)	WADA promotes, co-ordinates and monitors the fight against doping in sport. It co-ordinates development and implementation of the WADA code and runs world-wide athlete-testing programmes, passing positive test results to UK Sport. It also sets lists of prohibited substances and methods.

Formal minutes

Wednesday 7 February 2007

Members present:

Mr Phil Willis, in the Chair

Adam Afriyie
Dr Evan Harris
Dr Brian Iddon

Dr Bob Spink
Dr Desmond Turner

The Committee deliberated

Draft Report, *Human Enhancement Technologies in Sport*, proposed by the Chairman, brought up and read.

Ordered, That the Chairman's draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 130 read and agreed to.

Summary read and agreed to.

Abbreviations and Glossary read and agreed to.

Resolved, That the Report be the Second Report of the Committee to the House.

Ordered, That the Appendices to the Minutes of Evidence taken before the Committee be reported to the House.

Ordered, That the Chairman do make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Wednesday 21 February at Nine o'clock.

Witnesses

Wednesday 19 July 2006

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Mr Matthew Reader, Head of Elite Sports Team, Department for Culture, Media and Sport, **Mr John Scott**, Director of Drug Free Sport, and **Ms Allison Holloway**, Education Manager for Drug Free Sport, UK Sport Ev 1

Wednesday 25 October 2006

Professor Ian McGrath, University of Glasgow and Chairman of the Physiological Society, **Mr John Brewer**, Director of Sports Science and the Lucozade Sport Science Academy, GlaxoSmithKline, **Dr Bruce Hamilton**, Chief Medical Officer, UK Athletics and **Dr Anna Casey**, Research Fellow, QinetiQ Ev 17

Wednesday 29 November 2006

Dr Richard Budgett, Chief Medical Officer, British Olympic Association, and **Dr Arne Ljungqvist**, Chairman, International Olympic Committee (IOC) Medical Commission and Chairman of the World Anti-Doping Authority (WADA) Medical Research Committee Ev 34

Tuesday 12 December 2006

Rt Hon Richard Caborn MP, Minister for Sport, Department for Culture, Media and Sport Ev 50

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5	Professor MR Yeadon and Professor R J Maughan, School of Sport and Exercise Sciences, Loughborough University	Ev 70
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Oral evidence

Taken before the Science and Technology Committee

on Wednesday 19 July 2006

Members present:

Mr Phil Willis, in the Chair

Adam Afriyie
Mr Robert Flello
Dr Evan Harris

Dr Brian Iddon
Dr Desmond Turner

Witnesses: **Mr Matthew Reader**, Head of Elite Sports Team, Department for Culture, Media and Sport, **Mr John Scott**, Director of Drug Free Sport, and **Ms Allison Holloway**, Education Manager for Drug Free Sport, UK Sport, gave evidence.

Q1 Chairman: I welcome you all to the first formal evidence session of our inquiry into the human enhancement technologies in sport, and welcome particularly this morning Ms Allison Holloway, the education manager for Drug Free Sport UK, Mr John Scott, the director of Drug Free Sport UK, and Mr Matthew Reader, the head of the Elite Sports Team the Department for Culture Media and Sport. This session is being televised and beamed all around the world as we speak, so if we could be aware of that if things get heated. The purpose of this inquiry, because we have the Olympics here in 2012, is to look forward and say is this an Olympics that is going to be noted for its level of sport or, in fact, are the drug cheats or gene cheats going to dominate the agenda in 2012? What are we doing about it given we put so much store in having the Olympics in the UK? That is really the background. I have to say that one or two of the Committee and our science adviser were out in Lausanne at a conference a couple of weeks ago looking at sports science and what is happening in this area. Clearly this is an issue that everybody across Europe is concerned about. It is a very friendly session this morning and we hope you will enjoy it. Perhaps you could chair your panel, John. If you feel you can deflect the questions, then you are in charge. How much input does DCMS have into the drugs free sports programme in the UK and is there enough being done?

Mr Reader: The short answer is yes. There are probably three broad areas where government has a very important role to play in this area. Firstly, government clearly is responsible for setting the public funding landscape for sport. As you probably know, government does not run sport but we do direct, in terms of our public funding, to where we best think it has most effect. The second area, quite typical in DCMS, is that we sponsor a whole range of non-departmental public bodies, NDPBs, and UK Sport is an example of that. Where the government sets the overarching national policy for drug free sport, we look to our NDPBs, in this instance UK Sport, to actually deliver that policy. They are responsible ultimately for delivery of that. The third area in which the government has an important role to play concerns the things that

government can do that effectively an agency is not able to do. If I can give you an example, you probably will have heard of the UNESCO International Convention Against Doping in Sport, which I am pleased to say the UK has adopted and ratified. We are one of only 14 countries to have done so. Clearly that is something that governments can do, and a role we play, but something that a public agency would not be able to do. There are a whole host of other things that our department and our ministers do. Another example, the World Anti-Doping Agency, or WADA, is made up of 50% financial contributions from sports and 50% financial contributions from government. That is replicated in terms of the structure of the executive committee and the foundation board. As holders of the EU presidency last year, our Minister was one of the EU representatives on the WADA foundation board so he attended two meetings. At international level, and through a whole host of other international and European ministers meetings, we can influence in a way that probably UK Sport, whilst it is very much involved in international committees and forums, does not have.

Q2 Chairman: You see UK Sport as the delivery arm of government policy. How much interface is there between your ministers and UK Sport?

Mr Reader: On a formal basis we monitor the performance of UK Sport through our funding agreement. We have regular quarterly review meetings which are formal meetings to look at what UK Sport is doing against its funding agreement, and there are a number of measures and targets in that. Having said that, I would also like to say that we have a very good working relationship, and John will back me up on this. We are in regular contact about a whole host of issues in the drug free sport area. If there are certain issues that the government can do, whether it is across government with other government departments or on the international level, to support UK Sport's delivery of the national programme then we are very happy and willing to do that.

Q3 Chairman: It is often claimed, and you have claimed yourself, that UK Sport is a world class resource. How effective is UK Sport in drug testing? Would you say that is world class?

Mr Scott: Yes, I believe UK Sport is one of the world's leading National Anti-Doping Organisations. If you look at the speed with which we were able to respond to the new World Anti-Doping Code and receive the endorsement of WADA for our approach to its application, we were one of the first NADOs to receive that. That indicates that we have had a good system and, more importantly, we have been prepared to adapt and improve that system. I am certainly confident that we are certainly, in terms of comparison with our peers, one of the best. What struck me with your first question, is enough being done, I think the answer would have to be no but we are doing more. If you look at the increased investment that the Government has put into this area, but also that the board of UK Sport has chosen to direct more resources internally towards the issue of anti-doping, shows that we are taking this seriously. One area I would like to highlight where enough was not being done historically was in the whole area of education. Since I took over I have quadrupled the budget in education so there is a lot to be done.

Q4 Chairman: I want to come back to that because it is a big issue. Can I challenge you on this issue of world class? You say that but where is the evidence you are world class, just because you get their quickly in signing up to the code?

Mr Scott: That is one measure, but do not underestimate the difficulty of being code compliant. Underpinning code compliance is a whole raft of operational challenges, not least getting your sports on side, having your sports in a position where the rules and regulations will enable you to undertake doping, and if you catch someone that you are able to effectively prosecute them. It will involve things like quality assured doping control officers in a system whereby the entire chain of custody can be guaranteed and there are no loopholes that can be exploited by clever lawyers in breaking down a case. There is a whole raft of stuff. Do not underestimate being code compliant as simple; it is not.

Q5 Chairman: I apologise. That is a crucial measure. What are the other criteria by which you judge yourself as world class?

Mr Scott: We judge ourselves as world class in a number of areas, there is the technical competence of how we operate the programme. We are one of the few National Anti-Doping Organisations that has an ISO accreditation for our process. We are independently audited against an international standard. Secondly, we have one of the best accredited processes for training our DCOs. The doping control officers are absolutely critical in that interface with the athletes. They are the ones that are at the sharp end of this whole process. If they make a mistake, the whole thing falls apart. We put a huge amount of effort into recruiting, training and re-registering our DCOs. We are one of the few

countries that has an annual re-registration process for all our DCOs where they are obliged to come to a two-day seminar to go through a complete re-registration.

Q6 Chairman: What other countries would you regard as world class?

Mr Scott: A number of the European countries are world class. A number of the Scandinavian countries, where we have very good working relationships, are world class. Australia is another country that is world class.

Q7 Chairman: What about China?

Mr Scott: We do not know a huge amount about China. This is one of the areas where we are trying to get more information. Another responsibility within UK Sport is our international relations and we do have a memorandum with the Chinese. One of the areas we are trying to exploit through that memorandum is greater understanding of what they are doing in doping. They are not on the international scene. They do not participate in an open way with so much of this dialogue so it is difficult to assess, I have to be honest, the sophistication of their system.

Q8 Mr Ffello: How many people and what resources are you giving over to support the UK anti-doping policy, and specifically what more could be done? You mentioned about education but what more could be done with more resources?

Mr Reader: Do you mean in terms of internally in DCMS?

Q9 Mr Ffello: Yes.

Mr Reader: The Elite Sports Team is made up of five people, and we have a responsibility across the whole of elite sport from performance to anti-doping. Effectively I have one member of staff working on anti-doping in sport.

Q10 Mr Ffello: Do you feel that is enough? What is the rationale behind that?

Mr Reader: The rationale behind that is, as I set out at the beginning, we look at delivery of the policy to UK Sport, therefore the active delivery and active operation is delivered through John and his team. I am probably not in a position to start speculating as to whether more staff would be needed. Clearly it would be foolish of me to say no, that more staff would not be helpful, but if you took a broad look over what we in the UK are achieving, and harking a little bit to what John said about our world class delivery of the anti-doping policy, then I cannot think of anything, off the top of my head, in terms of additional work we could do with additional staff. Probably at the moment it is about right. Perhaps I should add that in the run-up to 2012 clearly there are going to be additional issues that we are going to have to consider as part of hosting the 2012 Games. There is in DCMS the Government Olympic Executive hosted within DCMS. We are in regular contact with them and doping is an issue that we discuss as an agenda item from time to time.

19 July 2006 Mr Matthew Reader, Mr John Scott and Ms Allison Holloway

Q11 Mr Ffello: I would like to address a similar question to John in terms of the number of people you have working in support of the anti-doping policy working with one person within DCMS. Do you think you have sufficient resources?

Mr Scott: We have seen an increase in our staffing in the last 18 months or two years. We are now 18 people in the Drug Free Sport Directorate. Of course, one of the services we provide to the department is we are the advisor to government on these matters. A lot of the information they require we are providing, and obviously the individual responsibility for doping is our primary conduit for that. As Matthew has explained, we also have these dialogues at both the monthly meetings that our management team has with DCMS and then our quarterly reviews. Doping is always an agenda item on those meetings so there is also that flow. The latter part of your question, is there enough resource, certainly for the time being. Where we have been increasing our resources has been on the information, science and education side. We are going through a major review of the programme application. In our submission you have seen us talk about intelligent testing. One of the agendas that is very much being debated internationally now is that it is not just about doping numbers, the test numbers that you do, it is about the effectiveness of those testing numbers. I think it would be fair to say there are a large number of tests internationally that are basically wasted because they are never going to catch someone who is doping in the way they are applied. What we have to do is use the 7,000 missions that we have got much more effectively, and we are working on that with what we call the intelligent testing model. That does not necessarily mean you need more staff but you need smarter systems.

Q12 Mr Ffello: One of the roles of UK Sport is to promote sport, but do you feel there is any conflict of interest between that role and in detecting doping?

Mr Scott: This is an issue that has been debated long and hard and there have been a number of inquiries and investigations into this. It is one of those probably that will always be on the table because there are some people that have very firm views one way or the other. What I know, as the director of Drug Free Sport, is within UK Sport there is a culture of total commitment to the highest possible ethical standards and that is manifested in the application of a unique approach to funding. We are now the only country internationally that will not allow any continuation of funding for an athlete caught with a serious doping offence. Other countries are following the formal sanctions process of WADA, whereas we do not believe it is acceptable at all for anyone who has chosen to take drugs to receive public funding. That is an example of the severity with which UK Sport addresses the problem. Some of the operational benefits of being within a high performance agency like UK Sport is a better understanding of the environment in which athletes operate. If we are to have a much more effective testing system, we have to understand that. We have to get close to the athletes, you have to

understand what makes them tick, what are the sort of pressures they are under and what are the programmes they are pursuing. It is very beneficial for us to have knowledge of that leading edge of technology.

Q13 Chairman: In this section can I finally ask you about the boundaries between different sports. There is an assumption, when one looks at the Olympics, that we are looking particularly at athletics, but your brief, and the other Olympic sports, is much wider than that. I wonder how you exert influence over the difference sports? A sport like cycling seems a law unto itself. Professional soccer is definitely a law unto itself. What influence do you have? How do you try to stop them falling through the cracks between the different sports?

Ms Holloway: We are very lucky with our education programme. We have very good partnerships with all of our governing bodies, and it is one of the areas where governing bodies are all working towards the same objectives. To begin with we are very fortunate, whether or not individual sports want to promote the same programme that we promote, for example with the 100% Me programme, is another matter, but the same principles are being promoted through education to all athletes. The Football Association is a very good example because they have a very good education programme, one they have been running for many years. They deliver education right down to grass roots level in football. Cycling is also a sport very supportive of promoting the consequences of doping in the sport. From a governing body perspective, they are very committed to promoting those issues.

Q14 Chairman: In terms of applying the sanctions that you are talking about, does that apply across all sports?

Mr Scott: The means of achieving that has been through what we call the National Governing Body Anti-Doping Agreement. That is a legally binding agreement between the sports councils, because it is a tripartite agreement, and the national governing body. That sets out the basis under which public funding or services will flow to a governing body. For example, to belong to the national anti-doping programme, in other words for testing to take place, you have to abide by the conditions of the agreement. We have been negotiating those for the last year to ensure that the governing body in signing up to that is code compliant. You will not be surprised to learn that one of the last to sign up has been football but that has been because of the lack of clarity from FIFA in terms of its rules being code compliant. I am sure you have read about the dispute that FIFA had with WADA which ended up in the Court of Arbitration for Sport. That has been resolved and those rules are coming down. We are confident that within the next few weeks we will have a formal agreement with football as well. We have that in place with all the other professional sports, rugby league, tennis, cricket; the agreement is in place. There is now a tight framework, rules and regulations, under which they operate.

Q15 Adam Afriyie: Only a small percentage of UK athletes are found to have been using illegal human enhancement technologies. Do you agree that that is an accurate reflection of the reality of the situation, or do you think it might be something to do with the reporting and detection?

Mr Scott: That is an extremely difficult question. Of course, a lot of the time you are dealing with supposition rather than fact. If you look at the facts of the current testing regime around the world, the average positive rate around the world is somewhere between 1.5 and 2% of the total number of tests undertaken. In the UK we are below that. Clearly there are certain sports where doping is a greater risk, where doping is probably more culturally acceptable or where the benefits of doping are more obvious. What we have to do is be very strategic in targeting how we apply our testing. We have done a lot of attitude testing with athletes, with young people, and it is interesting that there is clearly a resistance to doping in those young people but there are certain individuals quite clearly who will employ any technique if it means they are going to win. Uncovering who those individuals is the big challenge. We talk about the ABC types in UK Sport. A are the ones who will not cross the line. They are the ones who play by the rules. They are quite prepared obviously to seek the best possible advantage they can have through legitimate support, be it sports medicine, nutrition, all the scientific support that now underpins top level sport. Type B are those that have crossed the line once and seen the benefits, maybe have not been caught and are therefore tempted to continue. Then you have type C who are basically the more psychotic type that genuinely believe there is nothing wrong in cheating or perhaps they have every right to cheat.

Q16 Adam Afriyie: Refresh my memory as to what is your own explanation of the difference between the incidence reported in the UK and the figures reported to WADA?

Mr Scott: The global figures are an average across all countries. Our figures would be in line with a country like Norway or Sweden. I think Australia were slightly higher than us. If you look at comparable countries, we are actually remarkably similar. You are absolutely right to ask the question because it was the first question I asked when I took this on. If we are doing so many tests and we are apparently catching so few athletes, is the system not effective enough or are there far less drugs in the system than we thought? It is probably a bit of both, and that is why we have to continue to ensure that there is an effective deterrent in the number of tests you do. More importantly, we are continuing to gather the right kind of information and intelligence to get closer to the athletes and find out what is coming now.

Q17 Chairman: When you talk about the 2005–06 1.3% of tests being positive compared with roughly 2.3% from WADA across the global network, for

that 1.3% are they UK athletes or were they at least tested in the UK? If it is the latter, how many of them were UK athletes?

Mr Scott: Those are UK athletes because the result for an international athlete would be handled by the international federation, so those are reports of our athletes.

Q18 Dr Harris: Do you think all performance enhancing substances and methods should be considered cheating?

Mr Scott: Obviously the determination of what goes on to the prohibited list, and it is both substances and methods, is a long and exhaustive process. The final criteria that any addition has to meet are two of the three principles of the code. I think you understand that it is either performance enhancing, a danger to health or against the spirit of sport. Clearly there are a number of experts that are involved in that from across the world. There is a fairly exhaustive consultation process that goes on each year in terms of review and upgrading of the prohibited list, and there will also be differences of opinion. From a UK perspective, we have a number of concerns over the sorts of challenges that the inclusion of social drugs has had to the code, a number of individuals being caught there and whether that is the appropriate sanctioning mechanism, whether it should not be through a code of conduct mechanism with some opportunity for rehabilitation.

Q19 Dr Harris: That is an interesting point. Your evidence said, and I quote from paragraph 4.2 “The government believes that the use of performance enhancing substances and methods is cheating, contrary to the spirit of fair competition and damages the value and image of sport.” Did you mean illegal or prohibited performance enhancing substances, or was that your genuine view not an error but a Freudian slip? Do you think that all performance enhancing substances should be prohibited?

Mr Scott: It is in reference to the code. The link is directly to those substances that are deemed to be prohibited.

Q20 Dr Harris: It is a bit awkward because if something is deemed prohibited, and everything said in your education programme is that this is terrible, you must not do it, as soon as it is de-prohibited, like caffeine, it rather undermines your credibility for other countries as well. Would it not be better to always make the point that it is cheating because it is prohibited not just because it is performance enhancing?

Mr Scott: You have to have criteria under which you would deem it is prohibited.

Q21 Dr Harris: If you do not make the point that what you are objecting to is the use of prohibited substances not just substances, then you are rather undermined when they legalise something that you have condemned previously because you have condemned it in broad terms.

19 July 2006 Mr Matthew Reader, Mr John Scott and Ms Allison Holloway

Mr Reader: Certainly I accept your point. It is worth noting that the adoption of the code and the establishment of WADA is a huge leap forward in terms of fighting doping in sport. John will know better than I that 10 years ago when all sports were doing what they wanted it made it so much more difficult to have a harmonised set of rules and procedures in place. I want to emphasise that the code is a huge step forward. If your question is, is the prohibited list and the code a perfect document in every shape and form, then the answer would be no.

Q22 Dr Harris: That was not my question. What about hypoxic chambers? You do not know whether, from education point of view, to say do not go there or to say let us go for it and Britain should have its share.

Mr Scott: If that question is specifically on hypoxic chambers, of course what it gets to is in all these areas there is no absolute black and white; there are shades of grey here. When you are looking at the kind of stresses, strains and expectations placed on modern high performance athletes they clearly need all the appropriate support they can get to perform at those highest levels. This whole debate around hypoxic chambers is one that is being undertaken, as we sit here, through a consultation document WADA has put out. It is looking at it through those three criteria, the ethical base, the medical base and performance enhancing. We are still coming to our view but have not yet achieved a view. We have to submit a view later this year. So far I would say we have some concerns because at the heart of their argument is an issue about passive engagement in the exercise. If you start going down that route, that can open up a number of other areas: for example, is the application of physiotherapy a passive engagement; is the use of an ice bath a passive application.

Q23 Chairman: Such as sleeping at altitude.

Mr Scott: Absolutely. It is an extremely difficult debate but it is appropriate that the debate happen.

Q24 Dr Harris: You said you had concerns. Are you saying you have concerns because they are thinking because it is passive engagement it might be legal, or you are having concerns that they might actually not legalise it formally? I am not sure which way you are heading.

Mr Scott: At the moment we are tending to say that we are not ready for this. Firstly, it is extremely difficult to enforce this. How would you enforce it? Secondly, there is this issue about is it genuinely fulfilling the criteria that you are applying. That is why I got into the passivity debate. Of course, there is this issue of the degree of performance enhancement that it offers that is not available to others through other routes, as you referenced living at altitude. There are a number of areas that are mixed up in that debate.

Q25 Dr Harris: On this point, you did not raise it there, and I am interested to know genuinely because it is a fascinating issue, what UK Sport or DCMS's

view is. You did not say one of the criteria is, is there equity. Hypoxic chambers are not going to be available to everyone, for emerging countries and so forth. If you have an expensive enhancement therapy, as far as your policy thinking is concerned, should that ever be a factor? Should you permit things that are costly and first world enhancement?

Mr Scott: You cannot possibly apply an affordability factor. Equally, why is that the developed world are able to send its athletes for three months at great expense to train at altitude? That is not available to developing countries. Are you going to stop those athletes travelling? How would you do that?

Q26 Dr Turner: Are you comfortable with a situation whereby you clearly have substances with demonstrable performance enhancing properties which are not prohibited, and techniques which likewise enhance performance which are not prohibited? Does this worry you? Can you think of any examples you are looking to eliminate?

Mr Scott: We are relatively comfortable with the prohibited list as it is currently constructed. As I say, it is reviewed annually, there is a constant willingness to include new techniques or substances where they are shown to meet one of the three criteria.¹ We firmly believe that at the heart of any decision about what is to be included on that list should be the performance enhancement element. Certainly it is our belief that at the root of the World Anti-Doping Code is the idea that taking illegal substances is about cheating. It is about giving an unfair advantage through scientific manipulation, it is not about achieving an advantage through hard work and through the application of top class services. If the system can do that, absolutely fair and good. It is about using something that goes beyond, it moves into that ethical debate about what is right and what is wrong. That is always one of the factors that has to be debated when you are looking at the inclusion of anything on the prohibited list.

Q27 Dr Turner: Can we assume that there are candidate substances and techniques under consideration for the prohibited list at all times and currently?

Mr Scott: Yes, absolutely.

Q28 Dr Harris: What about safe performance enhancements where there are no obvious side effects and it is clearly for the benefit of the athlete, like laser eye surgery, which clearly enhances the ability of those sportsmen for whom that is important. Do you think that is an area where the line might need to be drawn, and whereabouts would you be inclined to draw it in respect of those issues, or drugs which aid healing, expensive drugs, new therapies, clearly for the benefit of the athlete but clearly enhance their ability to recover from exertion or injury?

¹ *Note by the witness:* I intended to say two of the three criteria.

Mr Scott: This is where the discrepancies are very apparent around the world. If someone has an exceptionally good health medical system that is available to that athlete in that country to heal themselves more quickly, that is absolutely fair and right. It would be wonderful if everyone could have access to that but we do not live in an equitable world. Your question about laser eye technology, clearly it is something that currently is not banned. There is, as I just explained to Dr Turner, a proper process by which these things are constantly reviewed. I am not a scientist. I am not a medical doctor, so I am not competent to comment about the performance enhancing elements. We rely very much on the quality, and it is an extremely high quality, group of people who rely on a number of sources to make those decisions.

Q29 Dr Harris: Before UK Sport or DCMS comes to their view, do you think we will be asked—and by “we” I mean either the public or Parliament—or is this just going to be you guys making a decision and giving a response to these issues that you are asked by WADA, hypoxic chambers, laser eye surgery? Is their consultation with parliament or the public?

Mr Scott: There is consultation with all our stakeholders. To undertake a public consultation would be extremely difficult. What we undertake is a consultation process with all the bodies on whom this has a direct impact. We consult with national governing bodies, with the sports medicine fraternity, the British Olympic Committee, the British Paralympic Committee, with DCMS. We have ethicists that input to this. We have a number of sources from whom we obtain a view.

Q30 Dr Harris: The public may have a view and you could ask them. There are opinion poll companies that do that very well. Is that something you would consider?

Mr Scott: I think we would. Of course, as you are already beginning to discover in the kind of debate you are having here, it is extremely difficult to get to the fine detail of what will force you to say yes or no. That needs a huge amount of the background, knowledge and understanding.

Q31 Adam Afriyie: What are you doing to identify new potentially illegal performance enhancing drugs? What work are you undertaking?

Mr Scott: UK Sport are not directly doing any work ourselves. We have a very small research budget and our research priority has been on social research. We felt, because of the need to improve the testing model that exists today, we need to get a better understanding of the mind set of the athletes and we are investing quite heavily in that kind of research.

Mr Reader: I think my first answer to that is WADA is uniquely placed to co-ordinate. All of the issues we have been talking about have application across the world. They are not unique to the UK. WADA has a fairly considerable research budget and commissions research around the world. I am very pleased that UK research institutions such as Southampton Medical School, the Horse Racing

Forensic laboratory, Nottingham Trent University, UCL, as well as our WADA accredited labs and Kings as well, have all been involved in, and are contributing to, the body of research evidence that quite rightly is co-ordinated through WADA. Obviously it is important that is then fed back around the world and informs people about WADA’s decision.

Q32 Adam Afriyie: In general terms DCMS, and therefore UK Sport, await reports from WADA and other institutions and act on that information rather than conducting active investigations themselves?

Mr Reader: I do not think that is quite right. UK Sport are clearly the Government’s expert advisers in this field and they work very closely with the WADA accredited laboratories. They have very close relationships with various research institutions around the country. The eyes and ears of the specialist people working on these sort of issues on a day-to-day basis, that network exists. If there are particular issues which government can help or contribute to, we would be willing to.

Q33 Adam Afriyie: I did not mean it as a slight. I was saying that UK Sport will initiate and investigate to find out what other new things are going on but not that you would conduct the research yourselves directly.

Mr Scott: No, and what we have learned, and Matthew made the point, is this needs an international solution. You have to have that global co-operation. What we do is we are in constant dialogue with the laboratory, and we are receiving all kinds of things from the laboratory about stuff that might need a bit of further investigation. We are sharing that with our international counterparts, primarily through the Association of National Anti-Doping Organisations where I sit on the executive, and through the International Anti-Doping Arrangement, which is the 10 leading NADOs. That debate, that discussion, helps inform the nature of the research submissions that then come forward to WADA.

Q34 Adam Afriyie: We have the 2012 Olympics coming towards us at a rate of knots. Are there any particular human enhancement technologies that you are concerned about in the run-up to the Olympics? Are there new ones coming onto the horizon or that would seem to be particularly attractive to the 2012 Olympics?

Mr Scott: I am not sure there are new ones. What is concerning is the growth in blood doping, which has been around for a number of years. As you know from the scandal in Spain, that is very much back on the agenda. Clearly the area that a lot of people debate, and you yourselves have looked at this, is the whole possibility of gene doping, genetic manipulation. At the moment the advice we receive from our experts is that it is probably premature, but this is a field that can make sudden leaps forward, and it is the speed with which that leap forward could move through into the sports system that we need to be very conscious of. The reality is that a lot

of the people who will be competing in 2012 in the Games are already in the system. That is the nature of high performance sport. It is only six years away and the likelihood of you being able to compete at the level required to represent your country at the Olympics you are probably quite well up the ladder. There is an opportunity certainly to see what is happening to those individuals through the current day doping programmes we all operate through the world.

Q35 Adam Afriyie: My final question is to Allison. You are on the education side. To step back to what Dr Harris was pressing at earlier, when it comes to education, if you are saying that it is morally wrong to use performance enhancing substances that is a very different proposition to saying it is morally wrong to break the code of conduct or the rules we have laid down. I would argue there is a very big difference between those concepts, and in the education you are providing or supplying that really ought to be made clear. Is that something that you do make clear?

Ms Holloway: With the launch of the 100% Me programme last year, the underlying principles of that programme were about personal choice. Obviously the philosophy behind the 100% Me programme is it was not just an education programme, it was there as a symbol to represent dedication and commitment and hard work on the part of an individual. Many athletes who were involved in the consultation and design of the programme really wanted us to establish a programme with which they could associate themselves to be able to say that they are drug free. One of the important aspects of the programme, and of the name of the programme, is that an athlete gets to make their own personal choice about the decisions they make in sport. It is important to us that athletes committed to completing cleanly have all the information and education at their disposal so they can make their choices. What you are talking about there is a moral choice, and particularly for current elite level athletes it is very difficult to shape the morals and the values of adults where those values have already been established. Therefore, we really do need to allow the athlete to make their own personal choice about what is right and wrong for them.

Q36 Adam Afriyie: If I were to read the 100% Me programme, would I find anywhere a statement that says that it is morally wrong to break the rules and the code of conduct because of the fairness issue but makes very clear that it is not necessarily morally wrong to use something which enhances your performance? Those are two distinct issues and I am wondering if that is clear.

Ms Holloway: We do promote fairness in sport through the education programme. Obviously we have a responsibility to promote the rules of the game as well. Therefore, it is essential that our lead athletes understand where they may be overstepping the mark. We do promote a level playing field and ethical principles. Going back to the idea of the

programme, it is about the individual making that personal choice. If it is not on the list, what is right for them? What makes them feel that they are 100% Me?

Q37 Dr Iddon: I would like to turn now to the actual testing programme. First of all, can I establish which samples your doping control officers take from the athlete? Is it just blood, just urine or a mixture?

Mr Scott: It can be either. It is primarily urine but it can entail blood as well.

Q38 Dr Iddon: Urine it is well known can be adulterated or substituted. What effort do you make to ensure that the sample is uncontaminated and intact at the time of testing?

Mr Scott: That is the whole process of the international standard for doping control which lays down the process by which the urine is collected. Obviously that is absolutely central to the integrity of the process, that urine cannot be contaminated in any way. We have an absolutely robust system for both the collection of the sample, the transfer of the sample to the tamper proof bottles, and the transmission of the sample to the laboratory for testing.

Q39 Dr Iddon: Are there any other limiting factors that you can tell us about that limit the testing technologies?

Mr Scott: In what context?

Q40 Dr Iddon: Let us turn to something specific, laboratory capacity and laboratories with the expertise. Do you feel there are enough of those?

Mr Scott: As you know, the UK is one of only three countries with two WADA accredited laboratories, at Kings College, London and at Newmarket HFL. Accreditation is a very, very exhaustive and exhausting process as the individuals will tell you. They are constantly monitored to achieve the highest standards. I believe there are 30 laboratories in the world now and they are all expected to meet those WADA standards. I think in terms of the accreditation process, the supervision of those standards, WADA does a very good job. I believe here in the UK we are exceptionally well served, that we have a laboratory in Kings which is one of the oldest and has an exceptionally good reputation and history, and HFL which is an extremely modern laboratory with a lot of resources behind it thanks to its association with the horse racing fraternity which has added a new capacity. It is great for us here in the UK that we have access to that number of qualified personnel.

Q41 Dr Iddon: My understanding is that the sample is split and half of it is sent by the organisations for testing and the other half of the sample is given to the athlete.

Mr Scott: No. The athlete is responsible for putting the sample into what is called the A and B bottle, then witnessing the sealing of those bottles, signing the sealing of those bottles, and both bottles are then sent to the laboratory. The A bottle is the one that

then goes through the whole sampling and testing process at the laboratory, and only if there is a positive finding is the B sample used. If it is a negative finding, the B sample is destroyed.

Q42 Dr Iddon: It seems to me, as an outsider, that two laboratories is a very small number of laboratories to handle a large number of samples which would happen when the 2012 Olympics are here.

Mr Scott: We will obviously gear up for that and there will be additional staffing resources brought in. What you find is at the time of the Olympics there is an international network of laboratories and you get an exchange of personnel. David Cowan, the professor at Kings, worked in Torino during the Torino Winter Olympics. In terms of qualified personnel, there is that international exchange. You only get those kind of pressures of a big multi-sport event infrequently, so you do not gear up a laboratory for that capacity year in year out. What you draw on is that international network.

Q43 Dr Iddon: Why not accredit a third laboratory or even a fourth?

Mr Scott: On an ongoing basis we do not need it. In terms of the number of the tests we do, and the number of tests undertaken in the system, there is enough capacity at Kings and HFL to do that.

Q44 Dr Iddon: When you come across an HET, an enhancement technology, which is essentially a drug or chemical substance, how much effort do you put in detecting that if it is something new and difficult to detect, let us say EPO, Erythropoietin?

Mr Scott: Obviously a huge amount of effort is put into that, and the history of EPO shows that with some really good intelligence and the provision of EPO to the lab it was very quickly able to put in place a system whereby it could be detected. I think the science that is in these labs is of the highest possible standard. More importantly, it is a science that is shared around the network of the 30 labs so there is this constant encouragement of improvement in the standards amongst the 30.

Q45 Dr Iddon: Who supports the research into detection of the new substances?

Mr Scott: WADA primarily. There are some national programmes. We ourselves have done some modest investment in the past, and we are going to be doing some research in the next year with both HFL and Kings looking at some of the tests that have been done historically, looking at some trends there. We will be doing that with our own labs.

Q46 Dr Iddon: Could you explain the advantages of intelligent testing as distinct from random testing?

Mr Scott: It goes back to my earlier comments. Last year there were about 180,000 tests undertaken globally in anti-doping. If you talk to WADA, they believe that maybe up to 50% of those were wasted and were not going to prove anything. They were not done in the right circumstances. They were not taking a sample when there was most likely to be

doping, or it was in the wrong sports or the wrong disciplines of the sports. What intelligent testing is about is improving the targeting of the tests we have available to us. It is understanding a lot more about the lifestyle of the athlete and the kind of pressures they are under where that risk of thinking "If I dope now I may gain an advantage." It is also about understanding more about the benefits of certain drugs, their life in the body, when they are most efficacious so that you are then testing when that it is at its peak and most likely to find there is a real benefit. It is very complex but it is something we have to address and have to put in place if we are to get maximum effectiveness out of the tests we have available to us.

Q47 Dr Turner: I imagine that when the 2012 Olympics arrives we will see the biggest drug testing programme ever undertaken in history. Will the extent and intensity of the programme be solely determined by what you think is in the best interests of eliminating cheating from the sport, or will it be limited by international laboratory capacity? Obviously, however good our laboratories are, they will not be able to take that workload on.

Mr Scott: Answering the second point first about capacity, there is always the provision of a huge temporary capacity at something like the Olympic Games. It is very easy to bring in the sophisticated testing machinery. As I have explained, there are number of individuals who are qualified to use that machine internationally who would also be brought in. I do not think capacity will be a problem.

Q48 Dr Turner: You have will have a tent full GC mass spectrometers.

Mr Scott: Perhaps we will rent a big hall somewhere. It will either be at Kings or HFL or both, and there will be an enhancement to the number of mass spectrometers, or whatever they have that they need to undertake the necessary testing, and individuals will be brought in. In terms of testing numbers, there are two parts to that. Obviously there is the extent to which the UK wishes to increase its testing in the run up to the Games. We have historically now always undertaken a very targeted programme of any British athlete that is likely to be going to the Games. We have wanted to ensure that any person representing GB is as clean as we can guarantee. We have now done very effective pre-game testing programmes for the Commonwealth Games, Winter Olympics and Paralympics, Summer Olympics and paralympics and that would certainly be central to our preparation. As we are likely to have the biggest team ever in London, that would mean a large increase in the number of tests. Also, of course, a lot of athletes from abroad will be here in the United Kingdom in the run-up to the Games, acclimatizing, getting used to the venues, there are potential training camps here, and one of the things we will be in discussion with the Government about is the extent to which we, as the National Anti-Doping Organisation, will be testing those people as well. Australia did that in the run-up to Sydney. There was a fair amount of that in Athens in the run-up to

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the Athens Games, and we think that is something we need to look at. That will require additional capacity too, but that is part of the pre-Games planning that we are only now beginning to get our heads around.

Q49 Dr Turner: Professor Waddington is quoted as saying that it seems strange and worrying that international elite athletes have an incidence of asthma several times that of the normal population. They, if they satisfy medical examination, are qualified for exemptions and are allowed to take certain drugs, including steroids, quite legitimately. Firstly, can I ask you how rigorous the medical assessment to qualify for the TUE is, and is it internationally consistent?

Mr Scott: I will ask Allison to answer that because she manages our TUE process and it would be helpful if she could explain that to you. Certainly I am very happy to say that we obviously have some concerns about the international consistency of the application of TUEs. That is one of the things we have put to WADA as one of the issues they need to tighten up in terms of international compliance with the code.

Ms Holloway: If I can reiterate as well, we do get a large number of TUEs in the UK and that is fairly consistent across the world, and in particular for us in medications and the use of gluco-cortico steroids as well. It is an ongoing concern for all National Anti-Doping Organisations and WADA. In terms of how rigorous the test is for the assessment of asthma applications, it is a little inconsistent. There are some international federations that require athletes to go through very rigorous respiratory lung function tests to assess their need for Beta-2 agonists. The problem with this in the UK, and therefore I expect the problem in many countries around the world, is there are only two places now in the UK where athletes can have this test done and very few experts that can conduct the test for athletes. That is a big problem we are facing at the moment. The international standards for therapeutic use exemptions, however, does not require athletes to provide any documented medical evidence for the use of asthma medication. It is something that, in our consultations to WADA, we have suggested that they need to look at, one way or the other, whether they downgrade it or they actually make it more effective in terms of monitoring it. All an athlete really needs to do is have a physician fill in an application, say that they have conducted an examination of sorts and maybe listened to the chest or a flow-loop examination, and then they submit the form and it is accepted on receipt of the application. We are very concerned about this and it is something that we have put forward as a recommendation to be reviewed.

Q50 Dr Turner: This sounds like a massive opportunity for abuse. Do you have any evidence, either anecdotal or whatever, that athletes are deliberately abusing and evading the system in this way?

Ms Holloway: It is difficult to know that. I think that is a possibility. With asthma it is difficult at the moment because there are differing views on whether or not it really is performance-enhancing for athletes that do not suffer from asthma or exercised-induced asthma. A lot of work in research is going into this to try to determine whether or not it is actually effective in enhancing performance. This is constantly being looked by the Science Committee and the Prohibited List Committee. I do not know whether it is being abused but you have recorded the figures there, so I guess: do we really think that many athletes in the UK and around the world have asthma? There is an increase in sports like swimming—

Chairman: Sixty per cent of cyclists have asthma. That seems strange, does it not?

Q51 Dr Turner: It must make you extremely suspicious, to say the least?

Mr Scott: We are naturally suspicious, I am afraid.

Ms Holloway: Yes, and it is something that we are looking at.

Q52 Dr Turner: Gene therapy manipulation is not a practical proposition at the moment but are you aware of any sports scientists around the world tinkering with it and looking for opportunities?

Mr Scott: There is speculation. I would have to put my hand up and say that I have seen no absolute evidence. What I have heard is a lot of rumour. I have heard that there is the prospect obviously of it being applied. I think some of the things that are being suggested are extremely scary, if they are true, and of course the one thing you must not be is complacent. It is extremely important that if anything is heard, it is properly investigated. Certainly I have not heard anything about which I would be in a position to say, "We need to do this". What I have heard and I am sure some of the stuff that you are hearing is that this is a real possibility. In what way is it a possibility? How is it going to be applied? Where does that transfer take place? Those are some of the questions that we are asking and we are having to continue to look at.

Q53 Dr Turner: We are not immediately going to see a race of super athletes, hopefully?

Mr Scott: I sincerely hope not.

Q54 Dr Turner: There have been criticisms about the accuracy and adequacy of data provided by testing. Clearly one must accept the UK laboratories on this. Is the reliability of testing across the world consistent? Are there problems here?

Mr Scott: I think the accreditation process and the standards that WADA is demanding of the laboratories is very high, and obviously they are continuing to try to ensure that those standards are maintained and, more importantly, are improved where there are weaknesses. I certainly believe that our laboratories have extremely good systems. Remember, HFL is one of the newer laboratories and so has gone through the new WADA process but that is even more rigorous than the previous one.

Obviously they had to go through re-accreditation but just to get accreditation in the first place is a much more rigorous process than that. The fact that there is a much better network now between the laboratories where there is this exchange of knowledge, this exchange of expertises, is helping as well. It is a little family; there are 30 of them and it is extremely useful that they can meet regularly. WADA facilitates that; it gets the labs together regularly. They are obviously in daily contact with each other. That is what that industry is like.

Q55 Dr Turner: Does this mean that whenever an athlete is tested in whatever country, his or her sample will be analysed to the same high standards and using the same techniques wherever they are?

Mr Scott: That is absolutely right. Where we may have some concerns is more on the sample collection procedure where I think not always our high standards are met, certainly in terms of the information given to the athlete; for example, chaperoning sometimes is extremely inadequate. Those sorts of issues are not yet consistent. Similarly, we have made these points to WADA that this needs to be tightened up.

Q56 Dr Turner: Are there ever any problems with storage of samples, samples getting degraded because they are badly stored?

Mr Scott: Any sample that is badly degraded obviously has to be rejected. That is one of the criteria that the lab would apply. Any inadequate sample would not go through the process.

Q57 Dr Iddon: Is there any mystery shopping done? Do you deliberately send to the laboratories samples that are contaminated?

Mr Scott: That is what WADA does all the time. The labs never know when it is coming or who it is from. Yes.

Q58 Dr Iddon: That is how the quality is maintained?

Mr Scott: Absolutely.

Q59 Dr Harris: How are we planning to learn from Beijing for London? I have a number of questions in this area, so you will have to be quick in your answers. Fire bullet points at me.

Mr Scott: We are learning from all the games, not just Beijing. As you know, WADA undertakes an independent observer programme for all the games. Just recently, they put on their website, for example, the reports from Torino and Melbourne, so we will obviously be studying those. We will work with LOCOG in terms of the delivery of the anti-doping programme. There are two options there in terms of how it is finally delivered: either UK Sport could deliver it, or we could be the advisers for the delivery. They gear up accordingly.

Q60 Dr Harris: Is someone responsible and is someone responsible for London 2012 going to go to Beijing?

Mr Scott: Yes.

Q61 Dr Harris: Who?

Mr Scott: I understand that they will be appointing a medical director. Anti-Doping will come under the responsibility of the medical director for the games. That person is not yet in post but we are still two years out from Beijing. That individual will carry that responsibility. I expect we will be there as well observing anti-doping at the Games.

Q62 Dr Harris: What are you going to do about coaches? There is a lot of stuff about athletes but some people feel that the problem starts with coaches and that if we can crack that, we might improve the situation? Is there some way of penalising coaches, or do you think that there is a case for criminalisation of people with that sort of responsibility?

Mr Scott: Certainly under the code, as you know, coaches are sanctionable where it can be proven that they have had any degree of intervention in either the application of doping or doping methods. The sanctions on the coaches are more severe, as you know, including a life-time ban. UK Sport similarly has a life-time ban instantly on any coach receiving public funding who has been involved with anti-doping. I think the education of the coaches is equally important as it is of the athlete. Remember that quite a lot of the doping that goes on is, even today, inadvertent. It is just plain stupid. They should not have taken something. So there is an important role to let the coach know what systems are in place to help the athlete make the right choice.

Q63 Dr Harris: On the subject of inadvertency, there is this issue of people saying they took a supplement and so forth. Do you think the recent legislation on vitamins and minerals has been helpful in this area?

Mr Scott: I think the whole issue of supplements remains a major challenge. We are just putting out a new guide to athletes. At the moment, what we can offer is advice basically on risk assessment and risk management of supplements. We would love to see an industry standard in the supplements area. That was a commitment given by a number of the big players at a seminar hosted by WADA last year in Germany. We would like to see progress on that front, but at the moment it remains a high risk.

Q64 Dr Harris: What about criminalising? I guess that is a policy issue. Are there thoughts about bringing criminal sanctions into this? France and Italy, as I understand it, do that but if it is not a controlled drug in this country, there is no criminal sanction.

Mr Reader: There are no current proposals to criminalise any aspects of anti-doping.

Q65 Dr Harris: Are you sure? The Home Office is always coming up with new things to ban from that.

Mr Reader: That may well be the case. There are substances and methods on the prohibited list which we have already touched on, which include social drugs—cocaine and heroin, for example. Clearly, as

Class A drugs, they are high priority for our law enforcement agencies. There are products on there, such as steroids, which I understand it is an offence to supply or possess with the intent to supply, but not possess for personal use. That is something that we keep under review.

Q66 Dr Harris: Are there thoughts in the run-up to London, and we have covered this in another inquiry, to toughen up the anabolic steroid enforcement side? I think these are Class C drugs.

Mr Reader: The short answer is that we keep it under review with the Home Office. There are no imminent plans. There are no specific plans at the current time.

Q67 Dr Harris: The moment when there is an alleged case of doping, governing bodies deal with that. Some people argue that there is a conflict of interest for those who are seeking to promote sport also being in charge of running the inquiry. Is there a case for an independent ombudsman type authority to deal with this so that not only is there no conflict of interest, but there is seen to be no conflict of interest?

Mr Reader: Yes, and I think this issue was touched on the Culture, Media and Sport select committee inquiry. There is a recommendation that UK Sport and the Government consider the establishment of a national tribunal service and that, as I understand it, is currently under consideration. UK Sport is undertaking an options appraisal into that.

Q68 Dr Harris: What about doctors? We know that doctors are involved in doping in other parts of the world. It would be hard to believe that if some of the things had happened in this country doctors would be involved. Are you confident that the World Medical Association for example is taking a tough enough line? Is the GMC actively involved as a stakeholder in trying to ensure that no doctor gets involved in this sort of stuff?

Mr Scott: We obviously work very closely with the medical profession. The likelihood of there being rogue doctors out here is a reality we have to consider. That is certainly what the Spanish scandal has revealed very clearly. Again, we put a lot of effort into ensuring that there is education material available to doctors so that they know the kinds of decisions they need to be making with regard to specific athletes, who are elite performers, because there are risks they run and any prescriptions that they may legitimately make to them for a medical reason could actually contain bad substances. Something as simple as that was what I was talking about by inadvertent doping. It is still possible but it is about that relationship between the athletes and their doctors.

Q69 Dr Harris: There have been no cases in this country of GMC-registered doctors so far being caught. Linford Christie told us in a seminar that I think was public that he did not think that the UK sports authorities were doing enough to educate people, despite the *100% Me* Campaign. I think he was aware of that. I do not want to go over

everything that has been one. We have had a lot of detail on that. Do you think that was a fair criticism or unfair?

Mr Scott: I would always be prepared to improve and do more. You have to remember where we come from. Certainly when Linford was in the system there was no education programme. *100% Me* was only launched in 2005. I would question on what basis he was making that judgment, whether that was a bit historic in terms of what he experienced when he was in the system. We are now I believe rolling out a very effective programme. UK Sport has finite resources here. We are having to work through others, so our prime target has been the training of trainers to deliver the message on our behalf, which is the focus on tutors in the governing bodies. If the governing bodies are responsible for their sport, we are educating and providing them with the resource to educate their people.

Q70 Dr Harris: I accept that answer. He was thinking more about what could be done in schools in terms of education, and everything is suggested for the citizenship side, maybe in school physical education lessons. I managed to go to a couple. I forged a note for everyone! That is an opportunity or maybe some of the sports degrees ought to have much more on this because a lot of athletes and coaches do go through that path.

Mr Reader: I accept that. I am sure more could be done through the curriculum. It is worth noting, and the point has been made, that any athlete who is in the system, however young they are, when they have been identified as having talent and they are starting to be supported, they will be made aware of and will be participating in *100% Me* programme. The other point I want to make is that you may be aware that the first inaugural UK School Games will be taking place in Glasgow, which will bring together all young talented athletes between 14 and 18. The idea is that that will be an annual event up until 2012. The purpose of it is to recreate an Olympic or Paralympic experience for young people. UK Sport will be there and will be publicising and encouraging athletes to be aware of the *100% Me* programme. That is another opportunity.

Q71 Dr Harris: So you have accepted that the curriculum has a role to play. Are DfES engaged with you at officials level or should we be asking DfES about school and university curricula?

Ms Holloway: There is quite a lot in the current curriculum at the moment that focuses on education around the misuse of drugs. At all Key Stage 1, 2, 3 and 4 levels, there is curriculum focused on drug misuse, but there is also in GCSE PE a focus on anti-doping as an issue in PE. A lot of the young people who are interested in going into sport in the future and working in some aspect of sport, whether that be as an athlete or coach or physiotherapist or whatever, are given access to education on anti-doping. I think the real problem that lies in schools at the moment is that the teachers do not necessarily know how to deliver on this subject. It is a very sensitive issue. They do not necessarily have the

expertise to deliver on the issue of drugs in schools. A National Healthy Schools Standard has been put into place. I do not know whether it has been rolled out across all schools yet but there is an expectation on schools that they have a recognised and named adviser within the school who can deal with drugs-related issues, that the schools are supposed to have a policy on how they deal with drug-related issues, and again, as I said, that the curriculum deals with drugs and the law, et cetera.

Q72 Dr Harris: Perhaps you could send us, within reason, a bundle of curriculum materials, and then we can make a judgment. I do not think we have had that yet.

Ms Holloway: We are currently developing some material for schools at the moment with various education consultants that do deliver education for teachers.

Q73 Dr Harris: I would be interested, if you have access to it, what is listed in the curriculum at the moment. Thank you for that answer. My last interest is about the doping control passport idea. What do you think the potential benefits or pitfalls of that approach are?

Mr Scott: It has been around for a while. We have looked at it. It would need the full cooperation of the international sports federations and, at the moment, I do not think that is there. Those that would require that are the ones operating at international level.

Q74 Dr Harris: That is a practical point but I am interested in what you think it could achieve and obviously whether it could work?

Mr Scott: That is the big question, if it does work.

Q75 Dr Harris: Assuming it could work, what do you think are the benefits?

Mr Scott: I suppose the primary benefit is that you have an up-to-date, ongoing data source about a particular individual. That is clearly of benefit. You would be recording the tests that were done. There is the ability to have a full briefing on what was in those tests. There are advantages to it.

Q76 Dr Harris: But there could be baseline physiological measures before the career enhancement starts.

Mr Scott: That could well be included.

Q77 Dr Harris: Would that be useful?

Mr Scott: Yes, undoubtedly, I think it could well be useful.

Q78 Dr Harris: Haemoglobin is a good measure, it is argued in the literature, for monitoring EPO use far better than hematacrit but you need a baseline level, do you not?

Mr Scott: You do.

Q79 Dr Harris: That might crack the EPO problem?

Mr Scott: It could contribute to it, certainly.

Q80 Dr Harris: You need to tell us if you think this is the case because I cannot put the evidence on the record. What about monitoring the financial rewards that an athlete has had so that a sanction regime could actually hit him in the wallet retrospectively rather than simply prospectively in respect of a ban?

Mr Scott: As you know, for example the IAAF does that already. You will have seen that with the Dwayne Chambers case where he has received a financial penalty for the rewards he gained when he was competing with drugs in his body.

Q81 Dr Harris: That is just one sport and in a sense he was punished for his honesty because he admitted a history of use, and I do not think many athletes and others in sport are going to queue up to do that, are they?

Mr Scott: No. the reality is that I would struggle to name athletes that have owned up to doping. Having been caught, most still maintain that they are innocent. Ben Johnson of course famously maintained his innocence until he was finally put on oath on the stand. It is the psychology of those types of people.

Q82 Dr Harris: If you think there are advantages to this passport idea, how are you collectively going to help push it because there are practical objections? Who is responsible for doing so?

Mr Scott: This is an issue that we believe again requires international partnership because there is no point in it being applied to just one group of athletes. You are talking about top level athletes who are competing constantly internationally, and so it needs the support of WADA, the IOC and the international federations concerned. The best forum for that is the Foundation Board of WADA because all those parties sit round that table and are represented at that table.

Q83 Chairman: Do we have someone on that?

Mr Scott: Not at the moment, no.

Mr Reader: There are five places allocated to Europe, two of which are to the Council of Europe and three of which are to the European Union, although currently one of those is the deputy chair. Currently and for the future, the EU presidency holder sits on the foundation board, and they consult Member States prior to the Foundation Board meeting. There is very much an opportunity and a responsibility to feed in views to our representative.

Q84 Chairman: John, I understand that the IOC may try to insist on immunity from prosecution of doctors and coaches who are found with Class A drugs within Olympic venues in 2012. What is our view on that?

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Mr Scott: I was not aware of that, Chairman. That is the first I have heard of that.

Q85 Chairman: Could I say that that is a possibility. Perhaps you could let us have a written note to say how you would respond?

Mr Scott: Have you been told that by the IOC? Is that something you have seen?

Q86 Chairman: It is something of which I have been informed which I would like to check out.

Mr Scott: Yes, we will look into that.

Q87 Margaret Moran: This is a question for Matthew. In the previous CMS select committee report there was a suggestion that there should be more cross-departmental working so that parts of the UK Government can jointly determine whether to seek to pre-empt the views of new medical research and developments by sportsmen and sportswomen and their coaches. How much co-ordination is there in practice across Government, for example, with the Home Office and Department of Health, and do you think that that kind of cross-departmental coordination could help to pre-empt the use of medical research? I should say that the Government's response did not actually address that issue. That is why we are particularly interested in it.

Mr Reader: The answer is that we have made informal contacts within Whitehall, and so we do regularly speak to our counterparts—for example, in the Home Office. I may have mentioned earlier that in terms of where the future threats are, there is an argument for saying that it would be helpful and advantageous to have a cross-governmental group of either officials and ministers. My answer to that would be that if there are particular issues that need to be addressed, then there may well be a benefit in that. In the first instance, we would very much look to UK Sport as our specialist adviser and through its network and through the WADA accredited laboratories and its research links into the various research organisations. They are the eyes and ears, if you like, out there in the field. If there are particular issues that Government can come together to address, then we are very happy to consider that. I suppose the short answer to the question is that there is not anything formal on the table at the moment.

Q88 Margaret Moran: There is no liaison directly with the Department of Health to work out what medical research is going on out there that might be helpful?

Mr Reader: Not in recent months; if there were a particular issue that had been identified, as I say, coming through the specialist and the experts in the field via UK Sport, then we would certainly speak to our colleagues about that.

Mr Scott: Alison can perhaps help you with something we are doing on that front.

Ms Holloway: We have obviously realised over recent years that there is very little joined-up thinking in this area. Research is a particular area to which we are starting to direct our attention, particularly because at first we were focused on

making sure our foundation programme was running effectively. Over the next year to two years, we will be looking at putting in place a research steering group to bring together academics and practitioners from various areas of sport, education and medical science who can help to advise us on where the best research or the most effective research could be. We will be looking at having within this steering group medical and scientific researchers and social science researchers to help us to do an audit of all the research that is going on at the moment across the world and also then to advise us on where we could recommend research investment could be placed for anti-doping.

Q89 Margaret Moran: In the first session, we heard some very powerful arguments around ethical issues for and against the use of HETs in sport. How far do those arguments feature within the WADA decision-making process and should there be more attention paid to those arguments and, if not, why not?

Mr Scott: Our view is very firmly that doping has no place in sport. We do not believe that the values that sport is meant to represent are helped in any way by people engaging in doping practices. WADA has clearly recognised the significance of the ethical debate by making the spirit of sport, the ethical dimension, one of the criteria under which they would consider applying a prohibited status to either a substance or a method. So they are very aware of that. The ethics of this is absolutely central to why we are in this. It goes to whether this is about something that should be controlled by sport, controlled by Government, whether it should be criminalised, whether it should be code of conduct. That is something about which, under the code and under the UNESCO Convention, there is still a degree of flexibility to allow individual countries to address that in the way they fit. For example, the code does allow for the continuation of a legislative framework which pertains in countries like France. Here the Government has taken the position that this is an issue that should be owned by sport, and that it is about the kind of sanctions that sport should be applying to people who are not following its rules. That reflects the culture and the moral framework that pertains in individual countries.

Q90 Dr Turner: We spoke about the prohibited list before. How much input do you as a body have into the WADA code and the prohibited list? Do you think the WADA code goes far enough to satisfy some of the concerns that you have, which we have already raised? There is a review going on. Which features would you like to see updated and what impact do you think the review is going to have?

Mr Scott: Firstly, may I reiterate the points that Matthew made about where we are now as to where we were? We must not underestimate the scale of progress that has been made with the advent of the WADA code to actually bring the range of sports together around a common agenda here and agree to a harmonisation in what are, quite often, very jealously guarded areas of responsibility. They do

not willingly give up any of that. To achieve the WADA code was a major milestone. As Matthew again said, it is not perfect. Of course we are at the sharp end of this. We are a national anti-doping organisation trying to make this work across over 50 sports in the United Kingdom context; that is nearly 200 governing bodies because we have one of the most complicated sporting systems in the world. Certainly, starting to roll something like a code out very practically means teasing out some of the challenges that the code represents. We have gone through a consultation process for this phase one, as we will with the following phases. The way we did that was to put up our initial thoughts on some of the pitfalls and areas that needed improvement in the WADA code, and we shared that with the stakeholders, and indeed with the public because it was available on our website. On the basis of that feedback, we have now submitted our response to WADA. It was reviewed by DCMS and by the Minister before it went. The Minister fully associated with it and then attached a forward to it picking out some of the key themes he felt WADA needed to address. That similarly is now available on our website. Within that are a number of very technical issues clearly in terms of making the code really work. There are some very fundamental points as well, which I think we have already begun to rehearse here about the nature of the banned list and getting it absolutely clear as to why something is on the banned list and what is an absolute given before something goes on the banned list. Should it be performance-enhancing plus or can it be that if it challenges the spirit of sport, and it is damaging to health? Clearly a lot of things are damaging to health but they are not on the banned list. That is something we are asking be looked at. We think that is absolutely fundamental to the code. One of the other big issues, and this is a huge challenge for WADA, is that we honestly believe that we are applying the code very rigorously to our athletes, absolutely rightly. We believe it is absolutely right that we do that, but we are not convinced that that is happening in other parts of the world and that, in terms of fairness, there is a question mark here as to whether our athletes, in terms of the rigour with which we are applying it, are being disadvantaged internationally. So code compliance, making sure that the rest of the world steps up to the bar, is the big challenge.

Q91 Dr Turner: Are you satisfied, too, because there have been criticisms that there is inconsistency in the application of the WADA code both in sports and countries? You have expressed your concern about the consistency between countries. Are you satisfied that it is being consistently applied across different sports in our own country? Are there any inconsistencies there?

Mr Scott: As you know, the code comprises some mandatory articles and some non-mandatory articles. I think it is in the non-mandatory articles that you will always get degrees of interpretation. Similarly, we are arguing that certain aspects of the code should now be upgraded to be mandatory.

There are some challenges in that. One of the things we are very sensitive to is that athletes want to feel they are being treated the same no matter what sport they are in, and I think we subscribe to that as well. We believe that is absolutely fair and appropriate. For example, there are some challenges in terms of making a system practically operate, and this is particularly true when you are looking at how team sports operate versus how individual sports operate, the sorts of lifestyles and the way these people have their lives managed for them. Putting in place a fair mechanism there does tease out some of the realities of translating a principle into practice. We are saying that has to be looked at as well because we feel at the moment that there are some loopholes in terms of the expectations we place on our individual athletes and what we place on our team athletes.

Q92 Dr Iddon: I want to move away from drugs now and perhaps look at other human-enhancement technologies. How much effort is the Government putting in to backing human-enhancement technologies, part from chemical substances?

Mr Reader: Do you mean in terms of legal things?

Q93 Dr Iddon: Yes, of course.

Mr Reader: The committee may be aware that the Chancellor announced a significant level of additional Exchequer investment into elite sport in the Budget in March. I think the total package between now and 2012 to support our elite athletes will be in the region of £600 million. There are three broad areas where that money is being directed: into the governing bodies for them to run their high performance programmes—that is employing the coaches, the performance directors and so forth; secondly, to the athletes themselves and UK Sport runs Athlete personal Awards, which basically is a contribution to the athlete's living expenses; the third area, which is the answer to your question, is in the support network around athletes. It is very important clearly for sports science and sports medicine—incorporating nutrition, psychology, biomechanics, strengthening and conditioning, all those sorts of areas—to make sure that in perfectly legal performance-enhancing activities athletes are receiving the very best services. That is delivered through the institute network. In England, that is the English Institute of Sport. UK Sport has taken on responsibility for oversight and the strategic direction of the English Institute of Sport. It is very closely locked in to the other two elements I talked about in terms of going into the governing bodies, so they are trying to bring together everything that the Institute is doing in direct support of the athletes and the governing bodies themselves.

Q94 Dr Iddon: When it comes to clothing and equipment in its broadest sense, do we rely on industry bringing new technologies to the Government, to the sports people, or is there some pressure from your organisations to get industry to enhance our athletes' performance? Which way does it go?

Mr Scott: Clearly the UK, in order to achieve the highest possible success at world level, needs to be improving performance all the time. Some of that will involve technology. If you look at the application, for example in swimming of the swimsuit, if you look at very technical sport like rowing where you are looking at the shape of the oar, these kinds of things are all extremely scientific. That is part and parcel of what sport is, particularly in those sorts of sports where it is seeking excellence in both the design and the technology and the athlete that uses them.

Q95 Dr Iddon: Who promotes the changes? Is it industry or is it your organisations, or is there a bit of both? Is there liaison?

Mr Scott: It is a bit of both; certainly through the Institute network, through the performance division of UK Sport, we constantly want to look at where there are opportunities to improve our athletes' performance.

Q96 Dr Iddon: Is WADA also promoting activities of this kind?

Mr Scott: No. The IOC clearly is but WADA is not.

Mr Reader: Clearly the national governing bodies in the UK, whether that be UK Athletics or British Swimming or many of the others, clearly have a very strong interest in making sure that their athletes are performing to their very best ability.

Q97 Dr Iddon: I am sorry, but I did not put that question very well. WADA is an anti-doping agency, I accept that. What I really meant to say is: are they looking at non-prohibited substances which may enhance athletes' performance worldwide?

Mr Scott: Yes. As I say, any substance, drug or whatever that could potentially lead to unfair advantage is constantly reviewed through the prohibited list process, which is an annual review. Proposals are put to that committee from a number of sources: the governing bodies and governments can put them forward. That is the process by which I think what you are seeking an answer to is undertaken.

Q98 Dr Iddon: Do we have access to their research, for example in improvements in nutritional standards for athletes and the use of legal supplements? Are we aware of what they are doing?

Mr Scott: The UK has a representative on that committee, and so we are very lucky that we get quite a lot of information as to what is going on within that committee.

Q99 Dr Iddon: Can you put a figure on how much money is going into giving human enhancement technologies that are not prohibited—clothing, equipment? Does anybody know?

Mr Scott: No. Clearly an element of what UK Sport invests in to the governing bodies has a technology element to it. For example, we are investing in sports medicine research and sports science research. We are doing work in nutrition and psychology. All

those areas are receiving support. It is obviously part of the total mix now that makes up the package that is needed to deliver world-class athletes.

Q100 Dr Iddon: Finally, when this money comes from Government, and Mathew has just mentioned a figure, who does it come down to and who is responsible for its distribution?

Mr Scott: UK Sport receives the money for what we call the performance pathway, and so all the money that is intended to take us from talent identification hopefully to podium success is managed through UK Sport. Obviously in the home countries—Scotland, Wales and Northern Ireland—there are different arrangements, but there is now what is called the institute network, so there is a lot of cooperation between the institutes and the sharing of knowledge.

Q101 Chairman: Can I finish with a couple of questions? We thank you very much this morning for the very frank way in which you have responded to our questions. I got the impression that you are running a very sophisticated and effective organisation within the current rules. You are very good at detecting what is out there and being able actually to deal with it. I think the whole committee would join me in complimenting you on that. There is one thing I have not got from you, if I am honest. Really this inquiry is trying to look ahead and see what UK Sport and the Government are doing in order to make sure that by 2012 we are ahead of the game rather than reacting to the game. You will say if that is an unfair criticism later. For instance, in answer to Brian Iddon's question about legal HETs, Matthew talked about this third stream of money that was coming from the Chancellor, but you were talking about what we are doing now, applying the biomechanics, the nutritional standards or the physiology development that we know now to our athletes. I think what Brian Iddon was getting at and what I would like to get at is: what are we doing looking forward? What investments are we making going forward? John, when you answered about gene therapy, you said it might or might not be there but we really do not know. We should know, should we not, because we know that in medical science there are huge developments being made in terms of gene therapy? It will not be in sports science where this occurs; it will be in medical science and we will pinch those ideas and take them forward. Do you ever speak to the MRC, for instance? Do you design research programmes with MRC looking forward? Do we do that on a European or world level? Do we do the forward-thinking research to make sure that by the time they start to apply these techniques, we are actually ahead of you?

Mr Scott: Chairman, if that is a criticism implied or other, I am absolutely happy to accept that. We, as an organisation, have had our work cut out in the last two years modernising our systems, bringing in a code that has just transformed the sporting landscape. Understandably, I think you will agree, we have had to deal with the here and now. You are absolutely right to say that we have to do more

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about thinking into the future, and I accept that fully. I think we must not underestimate the amount that there is out there and that in some small degree we are contributing to that, not least through the international networks that we are engaged with that. I have mentioned the Association of National Anti-Doping Organisations where this stuff is debated regularly. The International Anti-Doping Agreement is debated regularly. There is a Science Committee within the Council of Europe, which monitors the European Convention. We send representatives to that. These sorts of issues are debated regularly there. There are forums where, hopefully, the intelligence that is needed to map out how we begin to address these is being put together. I accept a criticism that we are not as actively engaged in it as perhaps we should be, but that is something we will now come to, having got the code in place and operating.

Q102 Chairman: My point is that HBO arrived and we reacted to it and where is that intelligence? Thank you for that. It would be useful if you could let us know what plans you have to coordinate that forward thinking.

Mr Scott: We are very happy to do that. We will share with you what our plans are, particularly for this research group, because that is central to this.

Q103 Chairman: This is the first time we have heard that.

Mr Scott: It is a new idea. We are beginning to put that in place.

Q104 Chairman: What is its budget and who will be on that?

Mr Scott: We can do that.

Q105 Chairman: My last question is on that theme too. Do you look outside the box, particularly if we take the military? Some of the most advanced thinking is going on in terms of human enhancement technologies within the military. It is useful for your troops to be able to stay awake for 36 or 48 hours to be able to perform at maximum capacity for longer periods of time. Do you look at what is happening with the military, both in the UK, the States and elsewhere, in order to pick up their ideas?

Mr Scott: That is a very good point.

Ms Holloway: There is work going on in the area of nutrition and health maintenance and things like that, and there is work being done with the military and with experts working within the military on how they treat the soldiers. There are some links there.

Mr Scott: Again, I think that is an area where we need to look again at the composition of this research group so that we are getting access perhaps to some of that knowledge. That is something we can certainly look into.

Chairman: On that note, may I thank you very much, John Scott, Alison Holloway and Matthew Reader, for your evidence this morning. This is the last evidence session on this subject.

Wednesday 25 October 2006

Members present:

Mr Phil Willis, in the Chair

Adam Afriyie
Mr Robert Flello
Dr Brian Iddon

Margaret Moran
Mr Brooks Newmark
Dr Desmond Turner

Witnesses: **Professor Ian McGrath**, University of Glasgow and Chairman of the Physiological Society, **Mr John Brewer**, Director of Sports Science and the Lucozade Sport Science Academy, GlaxoSmithKline, **Dr Bruce Hamilton**, Chief Medical Officer, UK Athletics and **Dr Anna Casey**, Research Fellow, QinetiQ, gave evidence.

Q106 Chairman: Good morning everyone. Could I particularly welcome our distinguished witnesses before us this morning, John Brewer, Director of Sports Science and the Lucozade Sport Science Academy, GlaxoSmithKline; Dr Bruce Hamilton, the Chief Medical Officer for UK Athletics; Professor Ian McGrath, University of Glasgow and Chairman of the Physiological Society; and last, but by no means least, Dr Anna Casey, Research Fellow at QinetiQ. Welcome to you all. I wonder if I could start this session by asking you to say what your role is in this particular area that the Committee is looking into, which is about human enhancement technologies in sport.

Mr Brewer: I am the Director of Sports Science at GlaxoSmithKline with particular responsibility for running the Lucozade Sports Science Academy. I have a responsibility for overseeing our research and development programme for sports science and also for developing our new product pipeline for new sports nutrition products that we use to enhance sports performance. I have a background of working in applied sports science for the last 20 years.

Q107 Chairman: Do you see athletics as a vehicle for selling your products or is it the other way round?

Mr Brewer: We are very much focussed on developing products that meet the needs of elite sports people across a range of sports, not just athletics but team sports (rugby, soccer and so on) and in doing that we have to produce products that are of the highest quality and which work. If we can do that then we are obviously very well aware that those products will then have a knock-on effect into the mass market. It is really looking to get elite endorsement for high quality products that would then be preferred by the consumer at the mass market level.

Q108 Chairman: So it is a two way process.

Mr Brewer: Very much so, yes.

Q109 Chairman: Dr Hamilton?

Dr Hamilton: My responsibility is Chief Medical Officer at UK Athletics. It gives me the responsibility for looking after the health and wellbeing of our athletes as well as the performance component of our athletes. From my perspective the relevant issues here are the enhancement of performance through preventing injury and the enhancement of

performance through the use of legitimate processes. The conflict that I always have is that we are always being asked to push the envelope where that grey area is within what is legal and what is not legal.

Q110 Chairman: I think we will return to that because that is a key area as to whether there is a conflict of interest between those two particular roles. Professor McGrath?

Professor McGrath: As you mentioned I have two roles here, one is that I am Chairman of the Physiological Society which is a learned society for the area of human physiology which is what sport is utilising. We have an interest in employing modern science in the area of human physiology and sport. I am not convinced that it is always the best science that applies in this area and we can come back to that. My day job as Professor of Physiology in Glasgow is to lead the Exercise Science group and there what we have been trying to do is to have Exercise Science embedded in a biomedical science group rather than a technologically oriented group. We have a new initiative called IDEAL (Institute of Diet, Exercise and Lifestyle) which means we look at the interaction of physiology and nutrition with exercise. We also have at the extreme of sport, studies on East African runners to see what makes them run better than everybody else. We are trying to work in an area between medicine and sport to look at physiological limits in both directions.

Q111 Chairman: Are East African runners different to our runners?

Professor McGrath: There is an international study into that at the moment. It is very interesting because the thing at the moment that ties up best is running to school. We are looking at the genetics are, we are looking at the physiology but the thing that correlates best at the moment is that those who run furthest to school do best as runners.

Q112 Chairman: There are 650 people in this building who would profit from being on your study; perhaps we could talk to you afterwards about that. Last, but by no means least, Dr Casey?

Dr Casey: I am Anna Casey; I am Research Leader in Human Metabolic Physiology and Nutrition at QinetiQ, formerly the Defence Evaluation Research Agency (we split from MoD back in 2002). My primary role is metabolic physiology and nutrition

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research. I do not have a teaching role. Our primary purpose is to support the MoD in terms of supplying research, supplying consultancy and in my case in helping the MoD to set the requirement for military feeding. Those are probably the major elements relevant to this inquiry.

Q113 Chairman: Could I ask you specifically, Dr Casey, whether in fact you would put into nutritional feed for soldiers or military personnel products which would be on the banned list of WADA for athletes?

Dr Casey: We certainly would not exclude that possibility. There is a very important distinction to make between performance enhancement and cheating in terms of breaking the rules of a given sport. Obviously in the military we do not have the same constraints as, for example, the IOC would have. One is always looking for something that would give military personnel an extra edge. In most cases, that is simply weaning them off hamburgers onto an appropriate diet and optimising their training. Those are obviously the two most important things. However, for a group of military personnel whose training is optimised and whose diet is optimised, who are highly trained and have great demands placed on them then we would consider appropriate ergogenic and cognitive aids. Of course, one is not always looking for a level playing field in a military context. In that context the overriding consideration would be one of health and safety: is that substance safe to use in the quantities that peer reviewed research has indicated is required for an ergogenic effect? I think there is an important distinction there.

Q114 Chairman: If you looked at something like EPO would you feed that as a normal course for soldiers who are going to have long periods in the battle field to raise their red blood cells?

Dr Casey: It is not being used by the military and there are no plans to use it. There are some safety concerns over it and that will always be the overriding factor. There are very few situations in which such a risk benefit analysis would take place. Although we would not exclude that possibility I think that it is further down the line. Certainly none of these things have been excluded.

Q115 Chairman: You have a wonderful opportunity—or the military have a wonderful opportunity—to be able to do research into performance enhancing drugs or technologies and for that research then to be actually transferred into sport or into other areas of medicine. Are you conscious of doing that or is the MoD conscious of doing that?

Dr Casey: Yes, absolutely.

Q116 Chairman: Could you give us an example where something has emerged within the military which has been transferred into sport?

Dr Casey: There are no obvious examples of that.² In fact what happens in most cases is that the military feeding initiatives are based on developments in sports science; that is the way round it often occurs. However, there is a lot of research funded by the Ministry of Defence which is into substances like modafinil, ephedrine, those types of things which are on the banned list which UK Sport, for instance, would not want to sponsor research in. There is still research going on sponsored by the Ministry of Defence into things like this. It does not mean they are being used but it does mean that they are keeping an open mind and they are sponsoring research in these areas. To my knowledge there are no illegal substances being researched by the MoD which have been transferred to athletes.

Q117 Chairman: Professor McGrath, just following on this theme, are you conscious of what is coming out of other areas of medical or military science which could be used in sport?

Professor McGrath: I think from the technological side there is a great deal in terms of monitoring devices. If you know the state of your soldiers when they are out there in situations of danger, that is something the military, I hope, is concentrating on very much and developing. These could very much come back into the sports sphere because the military have the resources and the money to develop these things. If you can know the temperature, if you know where they are using global positioning stuff, you know about their metabolic state, you know how much they are moving, all that can now be done in a sort of sci-fi way and fed back wirelessly. I think there is a great capacity for that. The other point I would make is that there has not actually been much good research into the difference, for example, between raising your blood through good altitude and giving EPO. That is an area I think the military could work on because it is very much in their interest to get maximised metabolic performance. The military could fund that kind of research which is ethically against sports to fund. I think you could get good physiological research funded by the military. I know Britain is not funding space technology, but space technology is enormously important here because of the metabolic demands of people who are in an isolated situation and feeding back information there. There is a great deal technologically but also physiologically, there is a job there; I do not know if the military is doing it, but they should be.

Q118 Chairman: What I am trying to get in this early session is a feel from you as to where the drivers for research are coming from. Obviously the military is one, but is it coming out of our medical research establishments? In your evidence you mentioned that we were pretty poor in terms of research.

Professor McGrath: The problem is that there are not the drivers to do the research; the remits of the research councils do not include sport. I know that

² *Note by the witness:* In the UK. There are several examples from the US military, including caffeine gum.

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EPSRC is getting on to this at the moment; they are having a meeting this weekend called “going for gold”. In general it is not the Medical Research Council’s job to do the physiology in relation to sport. It is not the BBSRC’s remit so there is not really a strong push on the resources going into this area. The scientific possibilities are there, but people who do this kind of work tend to drift off in their career into cardiovascular research or diabetes because they can apply the biological expertise there and get funding from either charities or research councils, whereas sports science tends to be a Cinderella subject which does not have the drivers. A lot of the money does come from the drinks industry and so on but it cannot be entirely independent.

Q119 Chairman: John, obviously you are a commercial company at the end of the day and we fully accept that, but do you actually spend a lot of money on research which has a direct impact on the athletes whom you are hoping will take your nutritional products?

Mr Brewer: We currently have a research budget for sports science which is approximately half a million pounds a year and we fund that in five academic universities, four in this country and one in Australia. I think there are two main drivers behind that research, one is for us to look at new claims and to develop new products, particularly the new product area where we are looking to fund research that will enable us to produce products which are different from the range that we currently have and which will give us cutting edge products and cutting edge claims that we can make around those products. We are also conscious of our need to fund what we would term blue sky research which is a research which may not have an immediate effect for us but which may enable us to enhance sports science knowledge and perhaps produce benefits in the longer term over the next five or 10 years.

Q120 Chairman: Where is the cross-over between SmithKline’s main pharmaceutical research and putting out products there which would have a performance enhancement cross-over into athletics and into your nutritional drinks? Does that occur?

Mr Brewer: Not to that great an extent to be quite honest. GlaxoSmithKline has, as you know, a major pharmaceutical business; we sit within the nutritional healthcare business in the UK and so we have a very much ring-fenced budget for sports science and sports nutrition research. However, it would be wrong to say that we are not in contact with our colleagues within our pharmaceutical business to look at other areas and other opportunities, but by and large there is quite a distinction between the pharmaceutical research that we conduct within a separate arm of the business and the very focussed sports science and applied sports science research that we conduct through our nutritional business side.

Q121 Chairman: Do some of your general products which I could take contain substances which would be on the WADA banned list?

Mr Brewer: Absolutely, categorically not. We have invested a huge sum of money in working with HFL (the WADA accredited laboratory in Newmarket) to have a process in place that enables us to say to the highest possible level that all of our products are free of substances on the WADA banned list. We have spent a lot of time and money in working closely with HFL and with colleagues at UK Sport to raise the bar as high as possible on not just the testing of the products but the whole supply chain from the production of the raw materials through to the production of the products themselves, the testing of the products and then the distribution of those products and the supply chain of those products to the athletes. We believe that it is of absolutely fundamental importance that we can provide athletes across a range of sports with a kite mark and quality assurance that enables them to purchase their sport nutrition products in the full knowledge that those products have been tested to the highest possible standards.

Q122 Chairman: We have that on record.

Mr Brewer: Thank you.

Q123 Adam Afriyie: Are you confident that GlaxoSmithKline have not invested in any organisations or are not doing overseas research for another branch of the organisation which may be influencing the development of human enhancement technologies in sport?

Mr Brewer: I can only speak on behalf of the nutritional business and I know the research that we fund which is very much focussed on legal, performance enhancing products. Obviously the rest of the pharmaceutical business of GlaxoSmithKline is huge and sits outside my remit and obviously that is done more for medical purposes and I would not want to comment on that.

Q124 Chairman: Dr Hamilton, if you find the nutritional companies are doing something but there is not a great deal of research coming elsewhere, is there a push from individual athletes or coaches or sports clubs or individual sports for more research?

Dr Hamilton: There is although in my experience athletes are not so much interested in research but outcomes and they will jump on a product or a technique or a strategy that they will perceive to work on the basis of no research at all. One of the issues that we have is that I am pushed into situations and encouraged to use techniques or procedures which are based on very little evidence. The push does not so much come for research, it comes to the utilising techniques. Sports medicine in this country is a relatively new profession and one of the underdone areas at this stage is access of sports medicines, sports physicians and practising clinicians to research and that is a real limitation to our practice at the moment.

Q125 Chairman: Professor McGrath, what do you think are the main developments in terms of the illegal human enhancement technology at the moment? Where should we be looking as a Committee?

Professor McGrath: I think pharmacology will always develop; drugs are continuously developing, they have been for the last fifty years and that will carry on. One of the difficulties is that sports people are interested in outcomes and are very susceptible to snake-oil salesmen. People come along with things that they say will help without any substantial scientific background to explain how that was developed and what the consequences are. I think pharmacology will continue to develop and we will have to try to keep one step ahead of that somehow. There are only three things that drugs can do: they can enhance physiological performance (heart, lungs, muscles, et cetera); they can cheat the brain safety devices and they can accelerate healing. Accelerating healing is probably something that is a good thing. The point of training is to make physiology better and it is a question of whether you are going to harm people by the drugs that you develop to speed that up. Probably the most dangerous things are the things that cheat the safety mechanisms of the brain. The drugs themselves might be difficult to detect and the consequences that they have may be difficult to detect. I think we will have to keep one step ahead of the game. We have not been very good at actually understanding what illegal drugs do. We have been quite quick to make them illegal and say that they might do harm, but we are not actually very good at understanding exactly what they do to the body. My thesis would be that if we understood better what they did to the body we would be one step ahead and we would be looking at the consequences of the drugs rather than having to search for unknown chemicals. It is obviously in the interests of governments and sports people all over the world to do whatever they can to enhance performance and if we want Britain to be winning medals what we have to do is find ways of stopping them using illegal techniques. I think probably finding ourselves ways of enhancing our athletes' performance is not where we should be putting the effort in; we should be putting the effort into making sure that we understand the things that people are doing to their athletes so that we can be one step ahead to stop it.

Q126 Mr Ffello: Dr Hamilton, I would like to return to some of the points you were saying about the challenges and the issues and the overlap there. Can I draw out a little bit more about the main challenges to a medic in the sporting world?

Dr Hamilton: We have to differentiate between the elite sporting world and the mainstream sports because the pressures and the management of athletes is entirely different. My role is one of both trying to maximise the health and wellbeing of the athletes, allow them to recover from training more quickly, allow them to progress and recover from injuries as rapidly as possible. I am also linked in closely with the science side of the sport trying to

maximise the performance. Quite often maximising performance will be in direct conflict with the health and wellbeing of the athlete. We can encourage someone to recover quickly and allow them to do more training, but that training may well be having long-term consequences for them in terms of osteoarthritis, in terms of injuries that may come on post the competitive period that they are interested in. There is a conflict there all the time between my role of trying to enhance the performance and trying to manage their injuries, and that is something we deal with on a day to day basis. There are conflicts in the area of medication use. What is illegal and perceived to be inappropriate to use today may well not be tomorrow and athletes are very quick to jump on that. A relevant example would be pseudoephedrine which was prohibited until a couple of years ago when it was taken off the list because—I am uncertain as to exactly why it was taken off—it was presumably so commonly found in over the counter medications that it was difficult to control its use. It was taken off the list but subsequently it has been shown in a research paper with Birmingham University and Asker Jeukendrup to have performance enhancement capabilities. Athletes will want to use that now and I am in no position to say they cannot use it, so we try to control it from a health perspective. Then the athlete will ask the question, “If I can use that, why can't I use this?” and it is very difficult to argue against that when two substances, methods or techniques or whatever it is will actually have the same risk benefit profile.

Q127 Mr Ffello: What are the methods you can use legally to enhance performance in a competitive environment?

Dr Hamilton: On the day performance enhancement pseudoephedrine is a product that legally people should be using within health limits. Creatines are another product that have been shown to have some performance enhancing benefits for certain events. We use a number of neuro-muscular stimulation techniques—manual techniques—to try to enhance the performance on the day to keep the muscles activated. Appropriate warm-up, appropriate fluid and appropriate diet are areas which are most commonly neglected and are big players.

Q128 Mr Ffello: Is there a tension on you to short cut some of those basics?

Dr Hamilton: No. There are always challenges to try to maximise everything, but my personal interaction with athletes is that they will not be challenging me to use illegitimate means; they would want me to push the envelope of legal means. Yes, I will be pushed to maximise it but within legal boundaries.

Q129 Mr Ffello: Dr Casey, you mentioned about trying to wean the troops off hamburgers and certainly through the Armed Forces Parliamentary Scheme there seems to be a fairly staple diet at training camps at Pirbright and Sandhurst and the like. It has been commented that trying to get the troops off smoking would have more of an impact

than anything else. Is there any research going on in that particular area in terms of looking at the way troops lead their social lives?

Dr Casey: We are not doing any research specifically aimed at smoking. I cannot speak on behalf of the Ministry of Defence, but certainly it is my understanding that there is an on-going discussion about smoking. It has been an on-going issue for many years, as you can imagine. A lot of the studies we do with basic recruits do not just cover the physiological side of training; we also do a lot of profiling in terms of their physiological responses to stress and also their coping mechanisms and that type of thing. In terms of the sort of person they are, that is something that is the subject of on-going research. We do not do a lot of social research within our department with these groups of people, but going back to the question of diet, I do not think it is any secret that certainly in the past the diets have had room for improvement but there has been a major overhaul over the last two years in the whole area of military feeding. When I started working with the military I started very much at the high performance end, ergogenic performance enhancement, and I have taken a step back at every stage and we are right back at the beginning now and we are really trying to address the entire issue of military feeding right from the recruit who walks through the door. That is where the big difference would be. I have mentioned that before and I agree with Bruce Hamilton that the biggest difference to your performance whether it is physical performance or cognitive performance, your mood state, how you train, how you recover, all of those things will be governed by what you are eating on a daily basis, not what supplements you are taking and what drugs you are taking or what you can get hold of. It is your daily diet, it is your training—how good is the training, how progressive is it, are you breaking the recruits in too early—all of which has been addressed over the last couple of years. There has been a major overhaul of the whole of military feeding, from your basic recruit right through to servicewomen—concentrating on pregnant women and also on special forces—and that is on-going at the moment.

Q130 Mr Ffello: Is that an area where the military is benefiting from research that has been done over many years in the sports field?

Dr Casey: Not necessarily the sports field but certainly in the areas of public health and general nutrition.

Q131 Mr Ffello: In terms of the quality of legal research in this country, how does it compare to the international position? Who are the world leaders in this area? How can the UK be the best compared to them?

Professor McGrath: I think that Britain is up there with the leaders in this area. Maybe Denmark, Sweden, Canada, Britain, the US, Australia, South Africa tend to be the leaders in this area. There is a big potential for making it better. There is better science out there that could be applied to this area if,

as I said, there was some driver to make people do it. In the last research assessment exercise of the universities in Britain there were only five groups that had a five star rating. That, in the whole of Britain, is not what you would be driving towards for an area of academic endeavour. Of these five three were very much technologically oriented groups—Loughborough, Manchester Metropolitan, Liverpool John Moores—and only Birmingham and Glasgow were embedded in biomedical science rather than in sport. There is a big potential there. There are a lot of other places in Britain who could be doing this kind of research if there was some driver. You would expect £500,000 of one MRC grant but there just are not the resources going into this area.

Q132 Mr Ffello: Mr Brewer, perhaps I could ask for your perspective on the same area. Obviously an organisation like yours is a multi-national one, so how would you see the comparison of the UK research in that field?

Mr Brewer: I guess we are in the fortunate position that we can cherry pick where we have our research done and it would be wrong to say that we do not look overseas to see if there are any opportunities there. The fact that four of the five universities that we currently fund are in the UK I think is testimony to the fact that we do rate very highly the quality of the academic research that can be obtained at key centres of excellence in the United Kingdom. Very important for us is working with academics who have the ability to do firstly high quality science but then work with us to translate that science into meaningful claims and meaningful language that we can then use to develop next generation products and to translate to the athletes and the coaches and the sports science and sports medicine support staff the benefits of those products and the benefits—as Dr Casey has said—of the correct nutritional strategy to support the supplementary parts of their diet that give them that extra half of 1%. I think we are very comfortable with the quality of academic research that we can obtain within the United Kingdom. The outputs that we obtain from that are very good, they have helped us to develop products over the years, they have helped us to develop new claims over the years. I think perhaps the classic claim from us from a business perspective is when we funded research at Loughborough University back in the late 1980s where we were able to show that isotonic drinks can improve performance by 33%. That was something that was generally known within the world of sports nutrition but it enabled us to take our products one stage further and to educate the coaches and athletes accordingly. That is very important to us, that delivery of an education message to support the product development which we can only get by working closely with academics.

Q133 Dr Iddon: Professor McGrath, when you said in your written evidence to the Committee that “much research in sports related topics is not cutting

edge and does not have sufficient scientific depth” were you referring only to UK work or were you referring to global work when you said that?

Professor McGrath: I think it would be a global phenomenon. It is an area where you can produce certain outcomes in terms of physiological studies of athletes quite cheaply, but to achieve any depth to move the thing forward in terms of science it is much more expensive. It is incontrovertible, that where we are moving forward, in areas such as cardiovascular research, cancer research, the quantities of monies involved are many multiples of the kind of money that goes into sports related research. Because the drivers are not there, the science is not being applied there, but the science could be applied. The science of physiology, biochemistry and molecular biology is all there, but where would you get the money to apply it to sport?

Q134 Dr Iddon: In your written evidence you have said that the whole science base is there, so can you perhaps tell the Committee what Britain needs to do to change this position if we are to be a world leader in our athletics with a view to the 2012 Olympics?

Professor McGrath: I could say you are too late for the 2012 Olympics, but the fact is that you could do things now if you put significantly more money into the system. I do not know where you would get it, but I would say that, would I not? If you put more money into the area of physiological research you would get some outcome, but I really do think that in terms of understanding the physiology behind these various forms of enhancement, if we did understand that better we would be able to set better limits. One of the difficulties in defining what should be illegal is often that you have achieved something that is way outside the norm, but we are not very good at defining the norm so we get into legal struggles about whether something is 30% more than anybody else would ever have, or is it 300 times. We really do not understand those kinds of things. We are quite good at measuring oxygen consumption and heart rates but we are not very good at the fundamental science that underlies it. What are the genes that are expressed when you take these drugs? Rather than looking for the drugs, we should look at the physiological effects of them. This is all possible; this is not science fiction. If more resources were going into this area we could be one step ahead of the dopers because we would be picking up the things that they are making the body do rather than picking up the things that go into the body.

Q135 Dr Iddon: With respect, that is all very negative. What we are looking for from our witnesses is to be able to make recommendations to government on the way forward. In an ideal world where do you think the money should be coming from if it were available, and who do you think should be responsible for allocating it?

Professor McGrath: I think it is quite a good thing to look at the different research councils for different purposes. You could persuade the Medical Research Council to be involved if you saw this as a continuum of improving human performance/

health with athletic performance being at one end of that spectrum and illness being at the other end of that spectrum. They would debate it quite strongly with you perhaps. I think the Medical Research Council could be involved there but the Biological Research Council could also be involved in terms of applying the best of modern biology to these sports related and health related issues.

Q136 Dr Iddon: The BBSRC?

Professor McGrath: Yes, the BBSRC. I looked at their website in vain for sports and exercise related topics. They actually had an acronym “sport” but it was nothing to do with sport. I do not think you could persuade them to use part of their existing budget to do it. Money would need to come in from outside and it would need to be a substantial amount of money, £20 million or something like that. A project costs half a million pounds and you would probably need to have consortia working on this. You mentioned Britain versus the rest of the world. Any of these projects that we are involved in—whether it is looking at East African runners or some other aspect of physiology—nearly always involve an international consortium of scientists because in order to get enough good groups who are the best in the area you have to work in that way.

Q137 Dr Iddon: If you were Colin Blakemore tomorrow where would you invest your money in this particular area? In other words, what would be your top three priorities?

Professor McGrath: My top priority would be looking at the gene expression consequences of some of the enhancement technologies. EPO would be a place to start. What are the gene expression consequences of technologies which enhance the oxygen carrying capacity of the blood. I think that would be one area that I would look at. I would also want to go for a couple of the most common types of drugs that are used illegally and I would try to look at the gene expression consequences of giving these drugs and the physiological consequences. It would not be cheap because there is no point in doing a study with half a dozen people here; you are talking about doing it with different populations: elite athletes, normal plodding athletes, normal members of the public.

Q138 Chairman: You cannot do it on elite athletes.

Professor McGrath: You can do it on sub-elite athletes if they are out of competition. That is the way these projects are planned. You cannot do the illegal doping with the elite athletes, but you can do the difference between them being at altitude and not being at altitude, those kinds of things, and you can compare it with other groups who are only a little bit off them in terms of percentage performance. You can do those things; they are ethically possible. However, nobody is doing them because why would you?

Q139 Dr Iddon: The Australians are doing it; we saw that in Australia and they do not believe that this altitude stuff makes more than half a per cent

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difference (that is what they told us). Do the other three witnesses before us this morning agree with Professor McGrath's analysis about who should be directing the money and where the priorities lie?

Dr Casey: Yes. We obviously have a slightly different experience. The Ministry of Defence do not tend to fund research directed at sport so that is not a major issue.

Q140 Dr Iddon: Why not? Running across the battlefield is very analogous to what sports people do.

Dr Casey: That is what I was about to say. Sport is not named but of course the majority of the work they place within our capability is all to do with training, recovery, exercise and performance enhancement so of course it is to do with sport, it is just not named that way. There is a fairly large programme of research funded by the Ministry of Defence to address this. For instance, we have very recently formed a consortium of industry, military and government organisations such as the Health and Safety Laboratory as well as five or six leading universities in the UK. We formed a consortium called the Haldane-Spearman Consortium which has recently won a competed contract from the Ministry of Defence Research Acquisition Organisation (the RAO) to perform human sciences research, most of which is based around these sorts of topics. It is an enabling contract which is worth potentially up to twenty million over the next six years. That is a recent development, so the Ministry of Defence is putting significant resources into preparing people for operations, preparing people for optimal performance and different environmental conditions using different technologies and different supplements and different ways of optimising performance. We have a slightly different experience in that the Ministry of Defence is putting a fair amount of money into this area. I should just add, we do not always use military subjects for these studies. A lot of these are well-controlled studies in an academic department and are performed in the same way as they would be in a university. We would often use populations of moderately trained or well trained athletes, cyclists, runners in the same way that we would in the university environment. We do use military subjects; we do need to match our subject populations to the military populations that we are addressing, but we do often do performance studies which use athletes.

Dr Turner: On the question of funding, I can see why you might hesitate to ask the MRC to fund this kind of research, or even BBSRC, because they have pretty serious remits. However, what we do have in sport is a massive billion pound industry which, if we had some system of imposing a levy across the whole sports industry, you could produce a twenty million a year budget with the greatest of ease. I just wondered if anyone had ever investigated that as a possibility.

Q141 Chairman: I have to tell you that when Harry Thomason set up one of the first sports laboratories at Salford University, Manchester United were his first customers.

Professor McGrath: If you go round the country a lot of sports science groups are giving support to football teams up and down the country. I think there is a requirement by the various organisations that they should have sports science support now. That has been quite a good thing in enhancing the volume of research if not necessarily the quality.

Mr Brewer: Going back to the question of 2012 and where we should be directing our resources to be successful in 2012, I think we have to accept as well that our success in 2012 will not just be based on performance in endurance sports; there will be team sports and powerbase sports—hockey, basketball and so on—where we will need to be successful. One of the areas that we would like to feel that more work is being done is showing to the performers in the countries in those team sports that appropriate nutritional practices will enable them to improve, not just the marathon runners and so on where we know the science has already established a very close link between sports nutrition and performance. I think there is a lot of work to be done across a broad category of sports to show that they can enhance their performance with correct nutrition. That is something we feel very strongly about. The other area where we feel that funding could be directed is towards the whole story of recovery. If you look at sports people at the moment there are far more sports people in full time training now thanks to the Lottery than there were 10 or 15 years ago. As a consequence of that, performers at the highest level are training on a daily basis for a number of hours, day after day. Quite often in team sports there are small squads as well. The whole issue of how do performers recover properly after training so that they can go back and train more effectively and train properly on a daily basis is something that I think is very important. If we can achieve that and achieve better recovery in terms of performance and immunity from illnesses—colds and so on—then I think that is an area we would certainly like to see research and development focussed in the build up to 2012 because I think there are some big wins to be gained from that.

Q142 Mr Newmark: How common is it for sporting bodies actually to undertake or commission research?

Dr Hamilton: In my experience it is very rare to commission research, primarily because the sporting bodies do not have funds to do so. We do develop clinical research based around practices that we are doing, so we would do a lot of auditing about procedures and we will, using our sports scientists that we have links with in track and field in particular, develop small projects based around developments that are going on. In terms of commissioning and paying for it, it is very limited.

Q143 Mr Newmark: Do you think this is something they should be doing or should it be left to other bodies to do?

Dr Hamilton: I agree with my colleagues in terms of what has been said about where the support and funding should be directed. From my perspective, there needs to be a tighter link between the clinical practice (and I include in that the sports physicians

and the coaching arena) and the university research. I think that is an area that I would look to tighten up. I am not certain of the evidence for that but certainly linking research to appropriate practice within the clinical realms would be a priority for me.

Q144 Mr Newmark: Dr Casey, you touched a bit on collaborative research for the soldiers. How much collaborative research do you actually undertake?

Dr Casey: Quite a lot, actually.

Q145 Mr Newmark: Who is it with? Is it with universities?

Dr Casey: Yes, we obviously now have this Haldane-Spearman Consortium and we are the prime contractor with Quintec as the lead partner; there are twenty other partners which include six universities (Nottingham, Loughborough, Birmingham, Cardiff, Glasgow and Cranfield School of Management), 12 specialist SMEs as well as the Health and Safety Laboratory. That is really quite new, so those collaborations are just getting up and running. We do have a long history of collaborations on fairly large research programmes with universities, in this area particularly with Birmingham, Loughborough, Liverpool and Nottingham. We have very close links with them and we do perform collaborative research with them on a regular basis. At some of these universities, such as Birmingham, we have programmes which have run end to end for 10 years or so. We have quite close links with them. I think we are quite good at collaborative research and that is partly because previously the majority of the Ministry of Defence funding we received had a small amount ring fenced which we were asked to use for collaborative research—it was one of the aims of the defence programmes that were given to us—and that got people in the habit, but it is done on a regular basis.

Q146 Mr Newmark: How much of that are one-off projects as opposed to long term funding for that?

Dr Casey: These tend to be three year programmes so they are fairly substantial. That is probably as much as a university would receive from a funding body in terms of sponsorship.

Q147 Mr Newmark: Is that a reasonable timeframe for you to do what is necessary?

Dr Casey: It is, and of course what happens—and has happened—is that you kick off with a three year programme, you establish a relationship, you have trained someone up within that university to do that particular work and you then renew those programmes. The funding for these programmes that I am talking about now has almost all come from the Ministry of Defence and we are then sub-contracting universities and it might be a formal relationship in the sense that we give them a sub-contract, but it is always collaborative in the sense of an academic collaboration. Often we will do work over and above what is required for that work programme out of academic interest and to pursue this area, which is the way that all of us have to operate.

Q148 Mr Newmark: John, how much collaborative research do you end up doing?

Mr Brewer: We have done a small amount with Dr Casey and her team, but otherwise in terms of collaborating with other businesses the answer to that is no, we fund our own work. We have links with five UK universities at the moment. We talk with the universities on an on-going basis.

Q149 Mr Newmark: Are those the same universities as Dr Casey or different ones?

Mr Brewer: Loughborough, Birmingham, Liverpool John Moores University and Bath University are the four that we work with in the UK. That is not to say it is written in tablets of stone; we do talk with other universities about perhaps doing different studies involving on-going work. We also fund work at the University of Melbourne, Institute of Technology in Australia. It is very much a moveable feast. We have core universities that we have worked with for a long period of time, Loughborough and Birmingham particularly, but we are always looking for new academic partners that we would like to work with. The number one priority for us is the quality of scientific work that they can do; the second point is to make sure that when we work with them that we are doing research work or we are supporting research work that will have an output for us whether it is for new product development or claims on existing products, or potentially blue sky work where we might see a benefit in five or 10 years' time.

Q150 Mr Newmark: Is there much overlap between what you are doing and what Dr Casey would do, or not?

Mr Brewer: Possibly not. As you would imagine, we are very sports nutrition focussed. Having said that, our sports nutrition work or research work does not just focus on the elite performers; we fund work that is looking at the overall effect of health on dehydration, for example, with people going into a gymnasium and sweating and losing fluid and how that can impair their performance on their day to day lifestyles. We have worked with Dr Casey and her colleagues at QinetiQ on that area.

Q151 Mr Newmark: Professor McGrath, where does the funding for academic research in sports related topics come from? We have heard a little bit comes from the military; where else is money coming from?

Professor McGrath: It comes from the drinks industry. It comes from devices manufacturers (people who make heart rate monitors or remote sensors for temperature, metabolism and things like that), a variety of commercial sources. People tend to get credit from research councils, by doing things that are related to exercise but which have health benefits. People would tend to go for BBSRC or MRC grants in an area that was in some priority area but crossed over into sport. They would develop their science that way and then they would use a skim off of some of that to do the more direct sports related stuff. Like any other academic institution or department they would be looking

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everywhere, but they would not be as successful at getting a big proportion from the research councils which, in academic terms, is what you get your brownie points for. It makes it very, very difficult to build up elite groups in universities because you have to do a lot of small grants which takes up a lot of time and do not develop the science enough. That is the problem.

Q152 Mr Newmark: In the universe of sports science, if you had a pie chart what percentage tends to come from commercial as opposed to military as opposed to government directly? Or through universities? I am just trying to understand where the balance is.

Professor McGrath: I think compared to equivalent areas of biomedical science probably twice as much would come from commercial sources and half as much would come from research council sources. That would be my guess.

Q153 Dr Turner: Professor McGrath, what can you tell us about the effectiveness of knowledge exchange between the different scientific disciplines in terms of sports related knowledge? Are the geneticists talking to the pharmacologists and the biochemists, et cetera?

Professor McGrath: I should say in defence of sports science that it is a very new subject. Universities have only been running degrees in sports science for twenty years; ours has been running twenty-one years this month and it is the oldest degree. If you look at the people around you the age profile shows you how high up people have got from British sports science developing. There are a few older people who were in physiology before and are now associated with it, but it is quite a young science. It is regarded as a kind of Johnny-Come-Lately soft science by people like geneticists and pharmacologists, but interestingly recently they have become more interested because they have seen that there are some very interesting applications of their science. We mentioned gene doping at the beginning and I have to say I think gene doping is a red herring. Gene therapy in medicine is a wonderful prospect but it is years away from being effective and to say that you can use gene doping in this area of performance enhancement I think is just a distraction. The interesting thing about genetics is not in terms of changing people's genes but in terms of having the technology to measure what other changes are happening in a person. Geneticists have started to become quite interested; even fairly hard core geneticists are quite interested. There are some good geneticists working in this area but they need to work with physiologist type sports scientists to make anything of it. You need to have people who are very good and know all about physiological changes that take place working with geneticists. A geneticist would be of no use on his own with this. You need to be in a place where you can get the resources to do this. We opened a laboratory last week with a million pounds of university money because they want to bring the geneticists and physiologists together. We have a suite of laboratories which have

bicycles and treadmills in one room with a molecular laboratory next to it and there is a metabolic laboratory for nutrition next to that. This is the kind of effort that people need to make.

Q154 Dr Turner: So you think there is a need for more inter-disciplinary approaches like this?

Professor McGrath: Absolutely, there is no question about that.

Q155 Dr Turner: What about the exchange between different sectors, not of scientific disciplines but between the academic world, industry and the military? How effective is that?

Professor McGrath: The interaction with the military has always been interesting because there has always been interaction between physiology and the military. Going back before my time there were always people who were coming in from the military to do joint projects and to teach the kind of stuff they did with endurance or deep sea diving. There has always been an interesting feedback with physiology and the military. At the moment there may be more of an inhibition in information exchange between the military and the outside world in technological terms. I think this remote sensing is quite an important thing. Satellite tracking tells you where a person is and how fast they are travelling even within a few metres, and monitoring of physiological performance. I think the military should be putting a lot of resources into that because it is extremely important. It would be terrific to transfer that into sport, but I do not know whether they would want to. I cannot speak for them, but if I were them I might be reluctant.

Q156 Dr Turner: What do the military have to say about it all?

Dr Casey: I cannot speak on behalf of the Ministry of Defence; I can only speak on behalf of QinetiQ. What I can say is that the UK Ministry of Defence has just placed a programme on physiological monitoring with the Haldane-Spearman Consortium and that does include remote physiological monitoring in the field. This is the type of thing you are talking about; it is being funded by the Ministry of Defence. We are not as far down the line as you might expect. I am talking here about physiological monitoring. There are other programmes within QinetiQ which deal with the physiological monitoring on a different scale. It is an on-going programme of work. I do not see any reason why that could not be translated into sport at the end of the day. I think you will find that the Ministry of Defence is always very pleased when it sees pull-through which goes beyond the military. I think that is something that both the Ministry of Defence and the providers of research for the Ministry of Defence like ourselves have not been as good at as we might have been in the past. The issue of pull-through is something they do now focus on and it is improving, not just outside but within the military. The pull-through of research into military policy is something that has improved considerably and is still improving and that does need to extend

to outside the military. They are very aware of that and very, very pleased when they see examples of that happening. I think you would find a willingness to do it, it is just doing it.

Professor McGrath: It is creating a forum for discussion and that may be one of the things we could bring out of this. We are bringing together people who would not normally have come together.

Q157 Dr Turner: Is there any scope for improvement and enhancement of relationships in this respect between industry and academia?

Mr Brewer: Yes, I think there is. To have a group where we, as a business, can raise the issues that we would like the research to be conducted in and have a team of academics who we could interact with to identify the best ways of conducting that research would be something that would be of great value. It is certainly an area that we have discussed within our business. Whilst we know the key individuals that we are working with, there may be other areas of expertise out there which we are not aware of which could give us the answers to some of the questions which we are raising.

Q158 Margaret Moran: We have just had a superb example of what was quoted to us that the communication across industry, across the military and you mentioned space is not there. I think the point is very well illustrated in that discussion. Is there a recognition of the value of knowledge transfer between different sectors involved here, industry, MoD, interest in space? Obviously you can have a forum which sounds like a good step forward, but the understanding and the value and actually doing the knowledge transfer is a further step on. What are the problems associated with that? Do you think there is reluctance to do that or do you think there are other things which would stand in the way of that kind of knowledge transfer?

Dr Casey: There are obviously concerns in terms of the military research in the sense that some of this is classified and would not be available. In terms of the unclassified research on performance enhancement you would find a willingness within the MoD to engage in that type of discussion. They are very open to this and it is not non-existent. To give a small example, UK Sport recently set up a short term working group which myself and your adviser sat on which brought together academics, myself from QinetiQ and UK Sport and actually produced a document for UK athletes with a view to 2012 on ergogenic aids and supplements and performance enhancement. That has now been published on the Internet. It is not non-existent; it does happen. That was actually pulled together by UK Sport and headed by them. It is a small example but that interaction is not non-existent. It is not as good as it should be, but it is not non-existent.

Mr Brewer: When we are working with our academic colleagues we always encourage them and would never restrict them from publishing the data that they produce from those studies in appropriate peer review journals or present that data at conferences. We have a very much encouraging and

positive attitude towards sharing that data. Obviously there will be a time delay between the point at which the studies have been completed and the time at which that data was published and we would want to use that time gap in order to make any product developments or new claim developments in order to give us the edge in terms of the products that we are producing. We would always have an open dialogue policy with all the data that we are commissioning with academia.

Q159 Margaret Moran: Why has it taken so long to have this understanding of knowledge transfer between the sectors? I take your point about sports science being relatively new. I always quote that Luton University in the last two years have developed a sports science course by accident. They actually advertised for a social science course and misspelt it and then discovered they had a number of takers for the course. Some are very new and very exploratory, but twenty-one years is actually quite a long time in the development of some of these issues. What has prevented this kind of knowledge transfer so far?

Mr Brewer: Can I say that I was fortunate enough to be employed by the Football Association in 1988 as their Sports Scientist and at that time I was the first sports scientist to be employed by a national governing body. To be quite frank, in that era—the late 1980s and early 1990s—there was no quest for sports science knowledge or sports nutrition knowledge by and large from the world of sport. I think we have to accept that the demands from sport and the world of sport have moved on enormously, particularly since the Lottery and especially in the last five or six years.

Q160 Chairman: While performance has got worse. We had world-class athletes like Seb Coe and Steve Ovett before you all started.

Mr Brewer: I suspect that people like James Cracknell, Matthew Pinsent and Sir Steve Redgrave would argue that. Maybe it has moved from one sport to another and let us hope that Bruce and his colleagues at UKA will soon be reaping the rewards of more medals in Beijing and 2012. I am sure they will.

Professor McGrath: Scientists love doing interdisciplinary research; it is terrifically interesting and it is great fun to do. The only reason they do not do more of it is that they tend to be in the straightjackets of their career. However, it is very easy to get them together by having a workshop that has money available for research at the end of it.

Q161 Margaret Moran: Does UK Sport consult industry or academia on substances on the WADA banned list? If they do not, should they? Would you welcome more consultation?

Mr Brewer: If I could answer that question, the answer is yes. I have sat on the UK Sports Supplement Review Panel working closely with colleagues at UK Sport on particularly the monitoring and the measurement of banned substances in products. As I mentioned earlier in this

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meeting we work closely with UK Sport and with HFL (one of the two WADA accredited laboratories in this country) to have all of our product range tested for contaminate substances. One major concern that we have at the moment is that there is a suggestion that WADA may remove their accreditation from their laboratories that test manufacturers' supplements some time in 2007. We believe that is a very backward step for WADA to be taking because we do feel that having their quality assurance of the laboratories that we work with to have supplements tested is absolutely fundamental. If WADA do withdraw that accreditation then we certainly think it is a very backward step for WADA to be taking.

Q162 Margaret Moran: Why are they closing?

Mr Brewer: We are not entirely sure of the reason why. We think it may be due to liability issues in that if they are accrediting a laboratory that inadvertently allows a substance to be put onto the market that has a banned substance in it then WADA could be liable. We, as a business, have already put our heads above the parapet working with a number of elite sports bodies including the ATP (Association of Tennis Professionals) where we are saying that we take liability. We are confident enough in our systems and in our measurement processes with HFL to know that we can provide products that are free of banned substances and have been tested for banned substances. If WADA withdraw their accreditation from their laboratories and prevent them, in effect, from testing manufacturers' supplements then again I think that is not necessarily detrimental to us as a business but it is detrimental to sport. If athletes have the ability to have a kite mark for quality assurance taken away from them, then I think that is something of major concern to us as a business and should be of major concern to sport in general.

Dr Hamilton: UK Sport has consulted widely with national governing bodies, sports physicians and the English Institute of Sport that I am associated with as well. The limiting factor there is the feedback that they get from the national governing bodies because there is a limited number of sports physicians working at that level, so the amount of feedback and the amount of time people can provide to give that feedback is quite limited. We try our best but there is a limited number of sports physicians working professionally in this area.

Chairman: It is quite a depressing picture that you are painting this morning if I am honest. The Ministry of Defence has all the money and is trying to share it, but I make the point seriously that we are searching in this area to say that by 2012 when the Olympics are in the UK we want it to be noted in terms of its sporting excellence and not, in fact, for the other stories which come about (use of drugs and enhancements and the rest of it). We were trying this morning to really look at where is the research base and that seems to be very patchy; where are the specialists, that seems to be very patchy; where is the money coming into it, again that seems to be very patchy; this latest set of questions in terms of sports

physicians, again you are right at the leading edge saying there are not sufficient people. I do not know about the rest of the Committee but I find it quite depressing really, but I will get over it as we move to Adam who is an eternal optimist.

Q163 Adam Afriyie: Professor McGrath has said that genetic manipulation may be a red herring, but there are many illegal human enhancement technologies that may pose a threat at 2012: designer drugs, stimulants to the central nervous system, blood doping, hormones. Which particular illegal human enhancement technologies do you think pose the greatest threat to 2012, given the state of research as it is at the moment?

Professor McGrath: Threat to Britain not winning any medals or threat to health?

Q164 Adam Afriyie: Threat of the use of substances which one would consider to be unacceptable.

Professor McGrath: I would go for substances that affect the central nervous system, which in effect overrides the body's safety mechanisms. I think that is the way people will die. The body has very well built-in systems that limit performance and if you can override them a little bit there is usually enough extra capacity in the heart and lung muscles et cetera to give you that advantage if you override the safety mechanisms. I would pin-point that as the most dangerous. Also, if you start interfering in the healing process in an ill-informed way you could cause a lot of long term problems.

Q165 Adam Afriyie: Dr Hamilton, would you agree that the central nervous system stimulants pose the greatest threat or do you have a different view?

Dr Hamilton: I agree with that from a health perspective, I think that is one of the major risks we face. In terms of performance enhancement illegitimately there have been a lot of developments in the designer anabolic agents that we are still playing catch-up on, of which the THG is one. For an endurance sport the EPO I think will continue to be a problem through 2012.

Q166 Adam Afriyie: In your experience, Dr Hamilton, how common is human enhancement technology use at present? Is it widespread?

Dr Hamilton: Human enhancement technology is widespread; we use it all the time (legitimate human enhancement technology, that is). As for illegitimate human enhancement technology I can only suppose that it is widespread. Every time we see a performance that we think does not quite fit that is the first thing people are thinking of these days, which is tragic for sport. I cannot give you a definitive answer to that question.

Q167 Adam Afriyie: You suspect but you do not have evidence that illegal use is that widespread.

Dr Hamilton: If you look at the positive tests as an appropriate measure of utilisation then the positive test rate is very low and so we would assume that

99.9% of athletes are not using illegitimate performance enhancing drugs but that is a poor outcome measure.

Q168 Mr Newmark: You say that but I can tell by your body language that clearly there is a lot of abuse going on and that somehow people are getting around the system. I am curious, how are they getting around the system? Is it through use of other drugs or are the drugs they are using so smart that they are always one step ahead of the testing regime?

Dr Hamilton: We suspect that it is a combination. We suspect that there are new drugs being used out there that are beyond the scope of the testing because we do not know what we are looking for.

Q169 Adam Afriyie: Who is making these drugs if there is so little research in the area?

Dr Hamilton: Until THG was found Balco Laboratories were producing the stuff, so until we knew what to look for no-one knew to go to the laboratory and look for it. We continue to suspect that that goes on in other places although I have to say that one of the great things that WADA did was to highlight the plight of the practitioner involved in drug practices and the number of people who have been prosecuted in the States now around the Balco episode will make people more nervous to be involved in the development of those types of drugs.

Q170 Adam Afriyie: In your experience how often is it that an athlete will place pressure on their medic to assist them with doping or performance enhancement substances that are close to the line, if not across the line?

Dr Hamilton: In my experience I have never had an athlete ask me for something that was illegitimate. Athletes are constantly pressuring you to do legal means of enhancement.

Q171 Adam Afriyie: Yes, and understandably with the competition. When athletes are caught they often say they did not know they had taken the substance. There is a view that some athletes are unintentionally taking banned substances because they are contained in vitamin supplements and other supplements that they may take. Do you think that over the last five, 10, 15 years when regulations around labelling have improved, that the situation of inadvertently taking banned substances has decreased or is less than it would have otherwise been?

Mr Brewer: If you look at the plethora of products that are available for athletes—you only have to go onto the Internet to see how many sports nutrition supplements are available—it is always going to be very difficult and very confusing for the athletes to know what works and also what is free of banned substances. That is why I would make the plea that we should have a recognised kite mark, a recognised standard of labelling.

Q172 Adam Afriyie: WADA accredit laboratories, do they not?

Mr Brewer: Yes, and the point I made earlier is that WADA accredit the laboratories which conduct two areas of analysis. One is the urine analysis of the athlete and the second is the area that we have moved into over the last five years which is the testing of our products prior to releasing them for sports people and, indeed, for the mass market. The issue that we have, as I mentioned earlier, is that WADA are looking to say to those laboratories that if they want to remain WADA accredited they can no longer test manufacturer's substances. That, for us, is a really big negative step. What we would rather do is work with WADA or work with colleagues at UK Sport to have a recognised kite mark that has a standard of manufacture, a standard of distribution and a standard of testing that enables a kite mark, a tick mark or whatever that would be, to be put on products that gives athletes across a range of sports the security in knowing that those products have been tested for all of the substances listed on the WADA banned list.

Q173 Adam Afriyie: Dr Hamilton, do you think that if that were done world-wide there would be no excuse whatsoever for an athlete saying he did not realise he had taken an illegal substance?

Dr Hamilton: Yes, I think it is important to clarify the difference between accidentally taking something that has a contaminate in it and accidentally taking something like ephedrine which you might have bought for a cold because people will still accidentally take something. We do not pay athletes for being smart or anything like that; we pay them for being athletes. We can all make those mistakes and so athletes will make those mistakes. Strict liability applies so that is the way it is.

Q174 Mr Newmark: You say that but at the end of the day an athlete knows that anything other than meat or vegetables that he is putting in his mouth, anything that looks, smells or tastes like a supplement—a pill, something for a headache—will have an impact on any urine or blood test. I still do not understand; do they not ask before they put any tablet in their mouth, if it is going to have an impact because there is a competition the following week. You say they are not that smart, but they are. They know that if they put a tablet in their mouth that is going to have an impact on a test.

Dr Hamilton: I did not say they are not that smart; I said that we do not pay them for being smart (many of them are very smart). It does not happen very often, but every now and then, under the pressure of a given situation—and every situation is different—I am sure that people do inadvertently take something that they should not take. As an example, many athletes will not take pseudoephedrine and yet pseudoephedrine is not on the banned list. They do not know that; they have not caught up with that and yet we are three years down the line. They are almost overly-protective.

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Q175 Mr Newmark: Why can there not be a mechanism whereby if an athlete has a cold they inform the dope testing people they are going to take a particular legal substance.

Dr Hamilton: There is such a process.

Professor McGrath: A point has been troubling me in this area recently which is that the ignorance of the pharmacology here is fantastic right throughout the whole world. What is fascinating is how do these people develop these designer drugs? Drugs companies spend hundreds of millions of pounds developing drugs, what is the actual process by which these people get these compounds and how do they test them to know which ones work because they must be making dozens of compounds? There just is no academic literature out there which describes all this and I think it would be much better if there was more information in the public domain through which you could educate both the coaches and the athletes so that you know what these things are, how they have been developed and how dangerous they are. These people are very clever; they make up these compounds and they work but we know absolutely nothing about the toxicity of these compounds. I think that is another area where there should be some effort put in.

Dr Casey: I do think that one of the major threats to 2012 is potential contamination of food supplements which are taken in good faith and that is why I entirely support what Mr Brewer was saying in that there has to be, between now and 2012, more effort put into making available certified, contaminant free food supplements. I think it is entirely naïve to take the view—which used to be the view of UK Sport—that we tell athletes not to take anything. I think it is an entirely naïve position. It has been shown not to work. We have to accept that they will take supplements; we have to accept that some supplements are worth taking. Some supplements are legal, they are worth taking and they will aid training, they will aid recovery and we have to accept that that is the case. What we need to do, I believe, is to put far more effort in and this is something that could be done between now and 2012. I agree with Professor McGrath that there is probably little we can do about the basic research base in the next six years—I believe it probably is too late for that, the pull through is a much longer time than that—but I think what can be done between now and the Olympics is to put much more effort into making available certified, contaminant free supplements to athletes. I think that would avoid a lot of the bad publicity that we have had in the past.

Q176 Adam Afriyie: Would there be unanimity of view on that level, that the accreditation, the proper labelling of supplements so that athletes know they can take them not with rash abandon but knowing that they will not be taking, unless through contamination, an illegal substance? Does everybody agree with that?

Dr Casey: I think it is less an issue of labelling. These substances are not subject to any controls; there is no requirement for research to do be done on these things. As long as they are not drug claims they can

make essentially what claims they like. It is not a question of labelling; I think it is a question of doing our best to produce contaminant free lines of the legal food supplements and other substances that we know they would like to take. I think that the initiative that Mr Brewer is talking about is very valuable in that case. That is something that can be done in the short term, something that you could do something about.

Q177 Adam Afriyie: John, surely there must be a commercial incentive to do that and, if there is, why are commercial organisations not producing contaminate free or properly labelled supplements and marketing the positive aspects of their brands?

Mr Brewer: There are manufacturers that are doing that. The problem is that in order to do that at the moment there is no regulation; there is no standard to enable you to put that tick mark on your product. What we are saying is that we should raise the bar as high as we possibly can and have a recognised audited process from the production of the raw material through to the manufacture of the product, the testing of the product, the distribution of the product that a manufacturer has to comply to in order to put that tick mark on their product. There are manufacturers—ourselves included and others I am sure within this room—who are producing products where they make contaminate tested claims. That is great and we would completely and utterly endorse that across the industry. What we are saying is that we should raise the bar as high as possible and perhaps consider having a global tick mark, one that is recognisable—a kite mark, whatever it would be—by sports people, certainly in the UK if not around the world.

Q178 Chairman: It would be asking WADA to actually endorse particular products and give a kite mark.

Mr Brewer: Conceivably.

Q179 Chairman: I can see a major problem with that.

Mr Brewer: Or it could be industry led. We, as an industry, have already done that.

Q180 Chairman: Sorry, I thought you were arguing for WADA to do that.

Mr Brewer: No, not necessarily. We would say that we would do it in conjunction with UK Sport or, as I say, led by the industry.

Q181 Chairman: You would want those tested through WADA approved laboratories?

Mr Brewer: We would like WADA to retain their accreditation of the laboratories to allow them to test manufacturers' supplements. As I said, it would be a retrograde step to take that away. As a general point, if we think that our athletes across sports are under pressure at the moment, in the build-up to 2012 those pressures are going to be immense. We will come out of 2008 with the Chinese host nation I am sure doing extremely well, so the pressures on our athletes to perform—as we are already seeing today—will be immense as we get to 2009, 2010 and

beyond. I think anything that we can do to give them that quality assurance to enable them to enhance their performance will be beneficial.

Q182 Dr Turner: There is obviously agreement that something needs to be done to avoid the situation, whether by ignorance or by contamination through the manufacturing process of the vitamin supplements, where athletes get into trouble. Anecdotally I think most of the cases that I have read about of athletes getting into trouble have been through this route. We agree we need a process to quality assure these products. Who should take responsibility for it and who is doing something about it? You have all agreed that it is highly desirable but nobody has said that So-and-So should do this.

Professor McGrath: The EU and the US drug administration have been struggling for years with what is a drug, what is vitamin and what is a food supplement. It is an extremely difficult topic to define what should be in what category. WADA then makes its mind up and puts things in one bin or another. It is an extremely difficult area to operate in. Her Majesty's Government is about to allow homeopathic medicines to be sold as if they did anything. If we are in a world where that happens legislatively—and I hope you are all going to oppose this—we are in a very difficult labelling situation here where all sorts of nonsense can get put on labels by governments, so how on earth are we going to separate these nutritional supplements from drugs? I think it is very difficult.

Mr Brewer: I think there is also the issue that we have to make sure before we accredit a product and say that it has been tested that it actually works and does what it says on the label. That is why working with good quality scientists is crucial to ensure that we are producing products that will enhance performance. The issue that we have is that in improving performance, if we move away from endurance sports, quite often the magnitude of improvement that you will see from any form of nutritional supplement is less than 1%. In order to prove that statistically to a level that then enables papers to be published to say that these products work is often very, very difficult to do. To give an example, you may have 10 subjects in the study. If six or seven of those subjects improve but three or four do not improve, that may not allow you to have the level of statistical significance that would enable a paper to be peer reviewed and published.

Q183 Dr Turner: In practice, you already have half a mechanism; you have a WADA list of banned substances, all you need is a mechanism for ensuring that where products are sold they do not contain any WADA list banned substances and they can be demonstrated and accredited that they do not. However, no-one seems to have any idea as to how or who should take responsibility for doing that. Clearly that would resolve a lot of the problems that happen.

Mr Brewer: There are colleagues from UK Sport here and others in the industry with whom we work very closely to put that process in place and a lot of work has gone on to ensure that the bar is raised as high as possible and there is a recognised standard for having that labelling put on products. What we would argue is that there should be a standard label and that the bar should be as high as possible.

Q184 Dr Turner: I just want someone to say who is actually going to take responsibility for putting this in place.

Dr Casey: It will probably rest at least initially with UK Sport, I would suggest. The problem you would have with this approach is that it would favour the larger companies that can afford to do this. This is a very expensive process and that might be one of the sticking points because smaller companies that produce nutritional supplements may simply not be able to afford to assure the provenance of their products right from the production of raw materials. There are many issues surrounding this but I would suggest that if you wanted a starting point then potentially UK Sport would be that starting point.

Q185 Dr Turner: Who wants to speculate about what the next challenges in the detection of illegal enhancements are going to be? Is it going to be growth hormones or what? Where are the next big challenges coming from?

Dr Hamilton: The challenges are everywhere. My personal belief would be that every component of the WADA code will be challenged over the next 10 to fifteen years because all of those areas will be areas where people are looking for enhancement. The challenges for us are developing tests for detection of substances that currently cannot be detected. Growth hormones and derivatives are classic. Those areas are extremely difficult scientifically to confirm or otherwise and then to develop a test that is appropriate is extremely difficult. That is just the stuff we know about at the moment. I am sure, as we were talking a moment ago, there are areas of development going into substances in the same areas of androgenic anabolics and of stimulants that will be being produced with the sole purpose of enhancing performance. WADA are very much trying to think ahead and to put their caps on as if they were the cheats and to think in those directions, but it is a very time consuming and very expensive procedure. I think all of the areas of the WADA code have challenges.

Q186 Dr Turner: There is the moral and philosophical debate that needs to be heard about what methods of enhancing human performance are acceptable and which are unacceptable and should be illegal. How much serious debate on this is going on through the different sports controlling bodies?

Dr Hamilton: There is a lot of debate going on. If you take an example—and you can argue whether it is appropriate for WADA to be doing this or not—WADA were recently looking into the use of artificial hypoxic chambers (artificially induced hypoxia) as a training aid and whether that should

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be on the prohibited list or not. Their findings were that they found that it was performance enhancing; they were not sure whether it was dangerous or not but they felt that it required further research as to whether it was dangerous and that it was against the spirit of sport. That was a long, drawn out process where they asked for submissions from all of their clients world-wide and there was a great deal of input. Essentially they decided that it met two out of three of the criteria which would enable it to be put on the list. At some point behind closed doors it was not put on the list so here is something which WADA have said meets their criteria but for undisclosed reasons has not been put on the list. We would agree with not putting it on the list but there is no transparency in whether it was a commercial interest that stopped them putting it on the list or whether it was the practicalities that stopped them putting it on the list. The sort of moral and scientific high ground that WADA have claimed—and they have claimed that ground—is challenged a little bit by the process which lacks a little bit of transparency.

Q187 Dr Turner: That sounds rather worrying. Are there any more examples of that?

Dr Hamilton: I can give you an example close to my heart whereby beta agonist—the salbutamol puffer that you will use for you asthma—the majority of the evidence is that it is not performance enhancing; there is very little clinical risk to someone using low dose inhaled beta agonist. The spirit of sport argument is somewhat weakened. If something is against the rules of a sport it is going to be against the spirit of sport, so while something is on the prohibited list it is very difficult for it not to be against the spirit of sport. For example pseudoephedrine would not be against the spirit of sport now because it is not on the banned list. The point being that because it is on the banned list the majority of people would come in and say that it is against the spirit of sport to use inhaled beta agonist; it is a self-fulfilling prophecy, if you like. That is an example whereby it does not meet the criteria—it is not performance enhancing, it is not dangerous, so it does not meet two out of three criteria—but it continues to be on the list. Not only does it continue to be on the list, but there are very strict criteria required in order to actually use it for legitimate purposes.

Q188 Dr Turner: Are you saying by inference then that if salbutamol was taken off the banned list there would be a dramatic reduction in the number of asthmatic cyclists?

Dr Hamilton: We are comfortable that the numbers of people using salbutamol in sport are appropriately using it, so I do not think it would change anything now.

Q189 Chairman: It is very difficult to explain why there are so many cyclists with asthma.

Dr Hamilton: The proportion of athletes with asthma corresponds to the proportion of the country with asthma. The highest incidence of asthma in athletes is found in those countries with the highest incidence of asthma in their general population.

Professor McGrath: There is not enough attention paid to what these drugs actually do. If WADA says that a substance probably causes harm but they do not actually know what it does, then maybe there needs to be more research. It all points to understanding these things better. If you understand what they do you can combat them better both through knowledge of what it will do to the body so that you can pick it up even if the drug is undetectable, and to find “what harm does it do?”. We have not heard any discussion—we could probably discuss it all day—about what a beta agonist does to the body. That happens to be very close to my own very specialist interest that you really do not want to start me talking about. We know very little about what it would do to the athlete that would cause any harm. It may be that by doing not all that much research you could find that out, but currently nobody knows. If it is a legitimate for other purposes you really need to know why it would be harmful, not just that it enhances performance.

Chairman: The whole issue of the ethical question that Des raised is very, very pertinent. If you have hypoxic chambers which are legal, why should you not be using an EPO drug to have the same effect which is readily or cheaply available? I think there are very big questions which hopefully we will try to address as we go through this inquiry.

Q190 Margaret Moran: Bruce, you have made it very clear that you think that the WADA prohibited list has some significant flaws in it. Do you think that there are particular substances—you mentioned one there—that you would like to see added or removed?

Dr Hamilton: The WADA prohibited list is a huge step forward from where we were prior to 2000 so it is a good thing in general. They are in the process of flux all the time so any comment I may make may well be something they are looking at changing in the future anyway. For example, they have taken pseudoephedrine off which, in some ways, was entirely appropriate but in other ways challenges the whole process. They have taken caffeine off; again the same principles apply. In some ways it has been trimmed but the problem is that while the categories may have been trimmed the number of substances within that category will expand. For example 10 years ago there might have been four or five stimulants listed, now there is a massive list of stimulants on there and it is very difficult to say that any particular one of those may or may not be performance enhancing or dangerous to use so it is hard to make a comment on those. The inhaled beta agonist is an area that for all sports physicians working in elite sport, is the single biggest factor that causes us concerns and anxieties within the list in terms of a failed drug test for legitimate use. That causes us a great deal of concern. The other area which is, in my opinion, weak in the WADA code is the use of glucocorticoids. Glucocorticoids, for

example a corticoid steroid injection for a joint inflammation, have definitely been abused in different sports in the past. The majority, however, are used for quite benign conditions. To give examples of the inconsistencies, you can use a glucocorticoid nasally—so you can use a nasal spray glucocorticoid—without requiring a therapeutic use exemptionary notification at all, but if you use exactly the same substance but inhale it through your mouth you are required to fill in the paperwork. If you are shown to have taken it through your mouth and test positive for it—which is, I admit, extremely unlikely—you can actually end up with a sanction. Those are subtle things and for a physician working with a team of perhaps eighty athletes, half of which he may not have come across before, trying to sort out all those things on all those athletes can be quite stressful. Also, the paperwork associated with it actually takes you away from the role you are trying to do so instead of doing educational talks or whatever you end up doing just paperwork on substances that are really quite irrelevant. It does not really matter if someone is using inhaled beta agonist because it does not work anyway; it is not very dangerous for them. All of my time leading up to the Commonwealth Games for example was spent filling out paperwork for inhaled beta agonists.

Q191 Margaret Moran: Here UK Sport both tests and prosecutes for doping offences; the Australian system is very different. Which do you think is better?

Dr Hamilton: I think it is difficult to have your educational supporting body being your prosecuting body. UK Athletics has exactly the same problem. Our anti-doping department will one day be the person who is ringing you up to make sure everything is okay and that you have filled out all the paper work and everything is good; the next day they will be shutting all the doors up and letting you know that you are under a sanction. It is extremely difficult.

Q192 Chairman: You would support separating the two functions.

Dr Hamilton: Absolutely.

Q193 Dr Iddon: A number of people have been critical about the way we tackle this doping problem, particularly blood doping. We have received some evidence, for example, from Michelle Verroken of Sporting Integrity. She believes there is an over-reliance on urine testing rather than more reliance on blood testing. She reckons that if we are serious about detecting the use of growth hormones and EPOs we really ought to concentrate on blood testing rather than urine testing. Would you agree with that, Dr Hamilton?

Dr Hamilton: I am not certain of the science behind that statement. In principle there was a debate some time ago about the ethics behind blood testing and I think in general most athletes are supportive of it so the ethical argument has been put aside. The real question is, is there an appropriate test? There is no point in taking blood if we do not have an

appropriate test. If there is an appropriate test developed for the substance we are looking for then I would support the use of more blood. However, if, for example, you could get just as good a test from saliva then I would equally support saliva.

Professor McGrath: There is an awful lot more in blood than there is in either saliva or urine and sometimes even if you do not know what you are testing for if you have that in the deep freeze you can test later. I think there is a big case for what has been referred to as the athlete's passport where you have a profile of the blood samples over a period of time. In a sense what is important is if there is big spike in something that changes rather than what the base line levels are. I think if you wanted to get really serious about how to tackle these types of problems it would be to monitor the athletes, keep samples from the athletes throughout their career at regular intervals, particularly around performance but also in between. Even years later, even if they have been using something that is not detectable, later we may have a way of detecting what it did. I think that is the only way you are going to get enough serious material because you have the science of looking at proteins, looking at small molecules, DNA, RNA; all of that can be done in blood.

Q194 Dr Iddon: The idea of an elite athlete's anti-doping passport came over very strongly when we were in Australia. The lady I have just mentioned has proposed that that is the way forward, to have such a passport. Because people's biochemistry—as you rightly point out—changes with time and it is even so different between one person and another, the only way to detect alterations in a person's biochemistry due to doping technologies is to regularly monitor their biochemistry. Michelle Verroken also suggests that there should be more in the passport than that, not just the analytical data from biochemistry but the prizes that people are winning as well should be recorded. Do you agree with that and is there anything else that you would add to the profile?

Professor McGrath: I do not think it would be all that difficult to make up a kind of CV for an athlete of what they are doing at any particular time: where they are, what they were doing, whether they are performing, whether they are winning, whether they are not winning. That is the kind of information that is going to be collected anyway by the coach. I would have thought that it was not a very big step to move in that direction.

Dr Hamilton: Using indirect markers which you are going to propose as a cheating mechanism is difficult because variables will change for reasons other than cheating. It is the distinction between a cheat and a non-cheat through indirect markers which is very difficult and is something you would have to get to a point where you were actually testing for something and you were very confident about it otherwise, as we have seen, it will not hold up in a court of law.

Q195 Dr Iddon: The final point I want to make—this is a point that Michelle Verroken has made as well but we picked it up in Australia too—is that where

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an athlete is performing at the very highest levels of international competition and winning huge prize money (which happens, of course) the penalties on those athletes when they are caught with a strange substance in their blood or urine are not great enough. They are earning large amounts of money but really if they are caught doping, since they are such serious role models in international sport, they really ought to be paying a large percentage of their prize money back if they are caught. She believes, and other people believe, that the penalties are not great enough when people are actually caught with illegal substances in their body fluids. Would you agree with that?

Dr Hamilton: I would agree with that but again I do not believe you can apply it across the board because there are different gradations of cheating.

Q196 Chairman: Let us take Dwain Chambers, for example. Should he have to pay everything back?

Dr Hamilton: Speaking generically when you admit to using a performance enhancing substance of that nature for that duration when money is made, I think it would be more than reasonable for an athlete to pay it back. I support what Michelle is saying; I just think it is not always black and white when someone is cheating.

Mr Brewer: I think there should also be a commonality across not just the Olympic sports but the professional sports as well and we have to recognise that there are a huge raft of sports that sit outside of the Olympic movement—both professional and non-professional—and we do need a common standard of punishment across all sports and not just allow individual governing bodies or associations to decide their own level of punishment for their particular sport.

Q197 Chairman: Dr Hamilton, in terms of WADA there seems to be a great deal of satisfaction in the way in which WADA is working. Are there any serious weaknesses to the WADA organisation that we should be aware of?

Dr Hamilton: I think WADA has revolutionised our approach to doping in sport and as a general rule I think the approach they are taking is very strong. I think their consultation process is difficult because of the number of interested parties that they have and that will always slow things down and make it difficult for them to be transparent. I certainly support the approach they have taken.

Chairman: On that note can I thank you all, John Brewer, Dr Bruce Hamilton, Professor McGrath and Dr Anna Casey, for your responses this morning. I also thank my colleagues and members of the public.

Wednesday 29 November 2006

Members present:

Mr Phil Willis, in the Chair

Adam Afriyie
Mr Robert Flello
Dr Evan Harris

Dr Brian Iddon
Dr Desmond Turner

Witnesses: **Dr Richard Budgett**, Chief Medical Officer, British Olympic Association, and **Dr Arne Ljungqvist**, Chairman, International Olympic Committee (IOC) Medical Commission and Chairman of the World Anti-Doping Authority (WADA) Medical Research Committee, gave evidence.

Q198 Chairman: Good morning and may I give a special warm welcome to Dr Richard Budgett and Dr Arne Ljungqvist. Thank you for coming before the Committee this morning and welcome to visitors to the Committee as well. May I begin by way of introduction by saying that this particular inquiry into human enhancement technologies in sport was originally designed looking ahead to the 2012 Olympics in London and whether in fact the Olympics in London in 2012 would be noted for their irregularities in terms of performance enhancement rather than in fact the sporting prowess of our athletes and what in fact we should be advising the British Government and indeed what we should be advising broader bodies like WADA in terms of preparation for the Olympics. That is the background to what we are doing. I think it is fair to say that we are increasingly finding it difficult, as I think many organisations involved in this area find it difficult, to be ahead of the cheats, to be ahead of the people who are developing the latest illegal enhancements and the new technologies. We are trying to get a handle on all of that as to how best we can keep our sport clean and how best we can deal with sporting prowess. We are particularly grateful to both of you for coming this morning to answer a number of our questions. I would like to begin with you, Dr Budgett. The percentage of athletes found to be taking illegal enhancement drugs or other technologies is relatively small: in 2005, out of 183,000 cases, 2.13% according to WADA. Should we be bothered about this at all? It is a terribly small percentage.

Dr Budgett: I think there are three ways of looking at it. The first is that the deterrent effect of the testing is keeping that percentage low; the second is that that is still an unacceptable percentage; and the third, which is what a lot of athletes suspect and many of us in doping suspect, is that there are people who go undetected. If you really were detecting everyone who was cheating, you would expect to catch almost nobody eventually because you would have a very strong deterrent effect, but obviously some people are still cheating and therefore I am afraid that we are catching everybody.

Q199 Chairman: Lots of people say to us that this really masks the real problem and that that very, very small percentage should not be taken as an accurate reflection, as you have just said. What would you guess to be this sort of extent then?

Dr Budgett: Unfortunately, in the position I am in, I am going to be the last person with whom athletes gossip. I really would be guessing and I do not know. Almost more important than what is the percentage is the perception of the athletes, the public and everybody else as to how serious this problem is. Some of the athletes to whom I have spoken and who I have known who have then been found guilty of a doping offence and who were guilty of a doping offence, it was not just an accident, justified it to themselves by saying, "Of course, lots of other people are cheating, most of my competitors are cheating, so I am just levelling the playing field". Their perception is that lots of athletes are cheating and that is as bad as was really the case.

Q200 Chairman: Dr Ljungqvist, do you accept the analysis that this is just the tip of the iceberg rather than the iceberg itself? Do the numbers of people being caught represent the reality of the number of people who are taking illegal substances?

Dr Ljungqvist: In order to respond to that question, I should first of all comment on the figure you gave because the actual figure is even lower. The 2.5% figure which you gave is the number of adverse analytical findings and amongst those are lots of therapeutic use exemptions, which means that the actual number of athletes who have been punished or are being punished or have been under prosecution for having committed a doping offence is much, much lower. It could even be 50% of the figure you gave. Whether that is the tip of the iceberg in sport or not, again, as Dr Budgett said, I too am in such a position that I would hesitate to make any guess and, since I am a scientist, I ought to be very careful. What I know and what I think is of vital interest is to be aware of the fact that the widest use of in particular androgenic anabolic steroids takes place outside organised sport. In my country, we have found lower gains for use, possession and so forth of androgenic anabolic steroids. We know that the amount of doping substances found by our police forces and at our borders by our customs is way beyond what we find in sport. We know that most of that use takes place outside organised sport/ outside elite sport for the simple reason that under those circumstances those people must know that controlled drugs exist and know their current mechanisms whereas, in sport, there is some sort of control. I would not use the terminology that the

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figures we find in sport represent the tip of the iceberg because we do not have any evidence for that being the case.

Q201 Chairman: Are there certain countries where guilt is more prevalent than in others and why is that?

Dr Ljungqvist: Yes.

Q202 Chairman: Can you give us examples?

Dr Ljungqvist: Yes, I can. We know that quite a number of those found and finally judged to be guilty of doping offences come from the former eastern European countries. I believe that we have pockets there where the information and education have not reached them, the key people such as coaches, team leaders etc. This is something about which government bodies out there are well aware and it is a fact.

Q203 Chairman: How are these countries' athletes able to compete on the international stage if that is so well known and so prevalent?

Dr Ljungqvist: They of course are at risk and some of them are found. We had a major problem with the United States earlier on before USADA (United States Anti-Doping Agency) was created which is now conducting efficient work and, as you know, they have found a number of top athletes in various sports, which is not a surprise to us.

Q204 Chairman: Dr Budgett, would you echo that, that across the world there are certain countries that are significantly more prone to doping than others?

Dr Budgett: Yes, I think so and it must be a combination of the effectiveness of the deterrent in those countries, hence the United States has improved vastly over the last few years, and the culture.

Q205 Chairman: Do you think that doping is more prevalent in certain sports?

Dr Budgett: Yes and you can see that from the statistics. In my own sport of rowing, there is a low prevalence of doping whereas in some other sports, like cycling, there are more cases.

Q206 Chairman: Why cycling?

Dr Budgett: I think it is probably the events and the culture of the sport.

Q207 Chairman: Yet rowing is a sport where muscle bulk is incredibly important. You would think that growth hormones would be used extensively.

Dr Budgett: It is a different physiological challenge to cycling on the road. It is more like track cycling where there is a lower incidence of doping than there is on the road.

Q208 Chairman: Dr Ljungqvist, can you explain why cycling has such a prevalence of drug taking? Is it just cultural?

Dr Ljungqvist: I would say that it is. It is not by chance that the IOC began their fight against doping, it was because of a death of a cyclist at the

Rome Olympic Games. That has been the culture for a long period of time. There have been deaths throughout the previous century from the beginning of the century; they did not do much about it; it was accepted as part of the professional cycling tours around Europe. The sporting authorities did not react until it came into the Olympic Games. So, the culture is there. Also, when it comes to professional cycling, it is a sort of a very close family, if I may say so. It is a fairly small group of people, a homogenous group in a sense, and they establish the culture. It is interesting that, when the Erythropoietin came on to the market in the late 1980s/early 1990s, it immediately started being misused by cyclists. We know that. We had evidence before WADA only a week ago by one of the top cyclists from the 1980s who won the *Tour de France* several times and he stated that EPO was widely used immediately it came on to the market and that it resulted in a number of death cases. Then the cyclists themselves decided to establish rules and have blood testing in order to protect their health.

Q209 Chairman: Is there any reason to believe that English sport is any different? If we take cycling, is there any reason to believe that our cyclists are drug free?

Dr Ljungqvist: One should not look at professional cyclists as being English or Swedish or German. They are professionals in teams which are private business enterprises. When it comes to amateur cyclists, I think that the amateur sport in your country and in my country is very different from the professional cycling that we are talking about.

Q210 Chairman: Dr Budgett, you are obviously nodding.

Dr Budgett: Yes and I would echo that. I think that the financial side is very important because there is a great deal of money in professional cycling and therefore the stakes are much higher, and that will drive people to cheat.

Q211 Chairman: Before I finish my round of questions, in terms of who is incentivising athletes to take drugs or other enhancements—and we will come on to some of the other enhancements later, so let us deal with drugs in particular—is it the athletes themselves and the financial incentives or is the coach, the doctors or the medics? Where is the driving force in your opinion?

Dr Budgett: This really is only an opinion and it is based on a very few cases of people I have talked to who have been guilty of doping offences and, in the two I know best, they were effectively self-driven. I know of cases which have been in the media where it has obviously been either the team or coach where there has been the culture that you were expected to be prepared to take these substances, otherwise you were letting the team down. That I think is a threat. I think that is really in some professional sports and, in the majority of cases, it is clandestine, it is individual, and those athletes spend a great deal of

their time and energy covering up and worrying about it, so there are large negative effects even before they get the negative effects from the doping.

Q212 Chairman: Dr Ljungqvist, where do you think the incentive comes from? Is it from the coaches, the medics or from the athletes themselves?

Dr Ljungqvist: Certainly there are always rumours circulating amongst the athletes, “Have you heard of this? Have you heard of that? Try this. Try that”. I would say that the entourage is possibly even more a pressure group such as coaches and the like because their success is dependent upon the success of their athletes. We have had numerous examples of coaches who have approached scientists with questions such as, “How do I get that? Where are you in the procedure of establishing new drugs?” etc, etc. There was a recent case which related to Great Britain where a former East German coach approached a company here asking for some Erythropoietin genetic material which had ceased to be produced which shows that coaches are out there searching for the latest news.

Q213 Dr Iddon: Is there not a danger in that, as you put more and more pressure on, which you obviously are doing and we would support you in that, the known HETs, more recently EPOs and blood doping in general, the coaches and the athletes themselves will move to unknown HETs which are possibly more dangerous? We have picked up evidence that people are stupidly taking veterinary growth hormones.

Dr Ljungqvist: Yes, absolutely. Being a medical scientist myself, I was amazed by the fact that apparently educated athletes even take THG, the designer steroid that was produced by the Balco Laboratory in California. If you manipulate the molecule, we all know that the effects and particularly the side effects may become totally different from what the original molecule would produce. Yet they were taking it. Any medication which goes on to the market is subjected to very careful investigations over a period of eight to 10 years. Whereas, in this case, it was immediately taken by the athletes without ever having been tested and they were really playing with their lives. One of them appeared again in front of WADA a year ago and testified that she had taken it without thinking about it in that way and that was an educated young athlete. It is amazing.

Q214 Mr Ffello: The WADA code is under review. What are the major changes that we might see, if any, following that review?

Dr Ljungqvist: I do not have a crystal ball in front of me. As you know, the work has just begun. We did have a first presentation at the WADA Executive Committee and Board Meeting 10 days ago by the Code Review Team and they are now circulating to various stakeholders around the world to get their opinion on the first draft that they presented to us. The final outcome may be totally different from the first draft that we saw. I believe that they will review the penalty system which has been criticised for

various reasons from various serious sides. I know that the standard penalty for a serious first doping is two years' ineligibility. It is proposed that flexibility be introduced which means that it can rise to three or four years for serious offences, for instance. They are attempting to introduce a more flexible penalty system. The List is believed by many to be possibly the most interesting part of the Code. That is reviewed every year, so that is part of the particular review now.

Q215 Dr Harris: I think we will come on to the List shortly.

Dr Ljungqvist: I am Chairman of the List Committee as well and we will try to produce a new draft list at the time of the Madrid Conference next year when the Code is up for a decision. Richard Budgett is also a member of the List Committee and we are discussing this. This is an ongoing discussion since we will have to issue a new List in 2007 anyhow and that will have to be done by the end of September of that year. I believe that the penalty will be an example of the change in the fundamental Code.

Q216 Dr Harris: Is the feeling out there—and I know that this is anecdotal—that the Code is working well or that there are problems with it and therefore people would expect to see a significant review or is the feeling that what is likely to happen is fine tuning?

Dr Ljungqvist: If I may give a personal opinion on this, of course the introduction of a more flexible penalty system which would allow a much tougher penalty for those who are the real cheats is not fine tuning, it is a real change. For the rest, it might well be fine tuning because it is the general opinion out there that the Code is functioning well and that it is a major step in the right direction to harmonise the anti-doping rules across the world, across nations and across sport and this is something that we have been asking for as long as I have been in the field which is 35 years.

Q217 Dr Harris: What about making all articles of the Code mandatory? What is your view on that, Dr Budgett? I think that some are non-mandatory codes.

Dr Budgett: We have talked about introducing more flexibility. When the Code was formed, personally I think it was a great step forward and very brave for the IOC to hand that over to a combined government/sports organisation which is what WADA is, but of course sport lost some control over anti-doping as a result of that and a number of things have come out of that and we are going to talk about the List later. We have talked about the length of ban and many of us in sport feel it should be four years, particularly Olympic sports. It is ridiculous if someone can come back and compete in the very next games having been caught the first time. The other is the way substances are selected for consideration to be included on the Prohibited List. Therefore, how important is the fact that they may be performance enhancing or are considered to be

performance enhancing and it is not explicit in the Code that that is the most important criterion of the three criteria.

Q218 Dr Harris: We are coming on to the Prohibited List and maybe we will leave those questions until we ask about them but I do have one question around that regarding this current rule that the non-performance enhancing drugs that happen to be unlawful in most jurisdictions, like marijuana and cannabis, are on the List and therefore people can face a two-year ban for taking something that is very common, does not affect their performance generally speaking and is in fact non-criminal in some jurisdictions. Is that still controversial?

Dr Budgett: Yes.

Q219 Dr Harris: Would you expand on that, please.

Dr Budgett: As I say, I think that is the penalty we pay for governments being included in putting the List together, so there is a large political push and now of course it is really difficult to withdraw some of those things like marijuana. Can you imagine the message that might send out and how difficult it is for governments to be seen to be going soft on that sort of thing? Of course, it is completely the wrong way of dealing with the problem in sport to penalise someone by banning them from the sport for two years when really what they need is help. I know that a number of sports do have proper rehabilitation programmes and proper counselling to get athletes through those sorts of problems. It is actually going to be adverse to their performance. In most sports, it will adversely affect their performance.

Q220 Dr Harris: Do you have anything to add on that, Dr Ljungqvist?

Dr Ljungqvist: Yes. At the time when WADA was born which was before Richard Budgett came on to the List Committee, we on the List Committee made an attempt to make a new start of the List and change it completely. At that time, the Preliminary List did not include narcotics and did not include cannabis, cocaine, etc, etc, the so-called social drugs that are not performance enhancing drugs in our view, but it was rejected by the WADA Board and we had to revert to the original List.

Q221 Dr Harris: There is an argument that, in that sense, that is a non-scientific approach, it is a more political approach and that potentially can be seen to undermine the confidence in the rigour of the scientific approach to the List.

Dr Ljungqvist: We had to try to combat that and make the List credible. Of the three criteria at that time that I think you know of, two of them need to be fulfilled in order to have a substance or method considered for its introduction on the List, which means that performance enhancement is not a must, but if you say that it can be dangerous to your health or against the spirit of sport, then you can include anything on the List based on those two criteria because everything has health risks, even medication has a health risk if you do not have a medical indication for its use, and it is of course against the

spirit of sport that a healthy athlete takes a drug which he does not need. So, anything could be included but we have to exercise some commonsense. I am happy that there is room for commonsense as well. When Richard and I and others in the group consider some new substance or method, generally we always have in mind the performance enhancing aspect of it and that is known. The List is large enough, for sure.

Q222 Dr Harris: My last question is to Dr Budgett. How difficult is it to be compliant with the Code for the UK? Is it a reasonable excuse for some countries to say that it is actually quite difficult without resources and therefore there has to be flexibility and time given particularly for countries with less resources and support and even in the UK?

Dr Budgett: In my opinion, I do not think that large resources are needed to be compliant with the Code. It does need government time in countries because legislation may have to be changed to be in compliance with the Code, but I do not think that it actually needs resources. It does not say how many tests you have to do, it just says the structure you have to have in place and I think it is quite right that compliance is insisted on by WADA and the IOC.

Q223 Chairman: Before I move on to Dr Turner, in terms of this review of the Code, I am interested in the compliance in the penalties. Is there anybody in WADA who is actually looking at the issue of disclosure? If we take Dwain Chambers who was using the Balco Laboratories, he received a two-year ban; he took the ban on the chin, fellow athletes lost their medals etc, but he retained most of the prize money that he won whilst he was competing having used illegal substances. However, he was not required to disclose, if you like, the pathway into Balco. Yet, to be able to deal a blow to the cheats is the most powerful weapon. Why is WADA not looking at that and making it a specific requirement: you cannot come back into the sport unless we have full disclosure of the pathway from where you were to where you actually acquired your enhancement? Why not? May I have an answer, please.

Dr Ljungqvist: As you can probably understand, it is very, very difficult to answer such a question. The problem we face over and over again with athletes is that they simply refuse to disclose. Most athletes, as you are probably aware, reject the actual result of the laboratory test and say, "This cannot be mine. I have never taken anything." This is the routine answer that we get. You will remember the Ben Johnson affair when he said repeatedly over and over again that he had never knowingly taken anything. Not until he was under oath in Canada was it disclosed that he had been on a sophisticated doping programme for 10 years. We believe that most people who take steroids or serious doping substances are well aware that they are doing it, know very well where it comes from and are well aware of the risks they take. However, they do not tell us.

Dr Budgett: The controversial thing which does happen is that there is an incentive for athletes to mitigate their penalty by revealing the background, how they obtained the drugs, who was involved, which athletes might be involved, and that came up in the Balco case, did it not?

Q224 Chairman: Yes.

Dr Budgett: Therefore, it can be effective and I would agree with Dr Ljungqvist that it is difficult because there may be the odd athlete who actually is innocent but has the substance in his urine—it would be very unusual but it could occasionally happen—but they are still going to suffer the penalty because of strict liability. Therefore, can you insist that they reveal from where they obtained the steroids when they do not know? I think that, on balance, it would be a sensible proposal that, before they are allowed back in the sport, they must tell the doping authorities where they obtained the substances.

Q225 Dr Harris: With Dwain Chambers, was there not the issue where the more he admitted once he had been found, the more he was punished in respect of returning prize moneys? That was a huge disincentive for people to cooperate. Surely, like in many other systems in many other situations, people are not treated that way when they admit in order to encourage self-referral for colleagues. For example, in the medical profession, if you are going to be treated harshly when you admit things, it is a huge disincentive. Airline pilots are a good example. If you admit something, there is hardly any sanction because there are bigger issues to be tackled. Is that a problem?

Dr Budgett: I have no personal experience of it but I am sure that it is a problem.

Q226 Dr Turner: Dr Ljungqvist, there are those who sometimes question the validity of the criteria used for listing and others who raise ethical arguments about what should or should not be permitted as performance enhancing techniques. What factors do you feel should be taken into account when substances are included on the WADA banned list?

Dr Ljungqvist: We do have the guidelines which are established in the WADA Code, namely the three criteria that I talked about. As I said, if you eliminate or disregard the performance enhancing aspect, you could place anything on the List based on the two remaining criteria. Therefore, we always have in mind whether those methods or substances have or could have any performance enhancing effect and, if so, we introduce them on to the List. We are very careful in introducing new substances and methods on the List because we know that, once they are on the List, it will be very difficult to take them off. We have had a few substances that we have finally been able to remove after a hard struggle. We are very careful. We have no other choice but to keep in mind the possible performance enhancing effect and that is where commonsense and I would say expertise knowledge comes into play.

Q227 Dr Turner: It is a judgment call at the end of the day as well.

Dr Ljungqvist: Yes, it is a judgment.

Dr Budgett: I would echo that. It is a difficult judgment and, as Dr Ljungqvist said, the List Committee make a recommendation to the Board of WADA who make the ultimate decision which can sometimes be a political decision, but we base our recommendation on scientific opinion. As was said, anything theoretically can be up for consideration on the List. We on the List Committee I think quite sensibly consider that performance enhancing is the most important of the three criteria and you also have to weigh the therapeutic use of that substance. There is a balance as to how important it could be to somebody's health to be able to take that substance and, by putting it on the Prohibited List, are you limiting athletes' use of a perfectly valid medication against its potential for abuse and performance enhancement?

Q228 Dr Turner: Are you happy with the List as it stands?

Dr Budgett: I think I have already indicated that I am not.

Q229 Dr Turner: Are there substances out there that you would wish to see included?

Dr Budgett: Categories that I wish were not on the List.

Q230 Dr Turner: Are there any categories and any substances that you do think should be on the List which currently are not?

Dr Budgett: I personally think—and I know that a number are of the same opinion—that efforts should be focused on the real problems of doping in sport which is on the anabolic agents, the Erythropoietin and blood doping, which are the serious concerns we have. We are almost sidetracked and certainly those of us in the fight against doping in sport who are trying to educate our athletes spend an awful lot of energy on what I would consider to be peripheral issues, making sure that people do not inadvertently take a banned substance and filling out lots of forms for therapeutic use exemptions.

Q231 Dr Turner: Dr Ljungqvist, what is your view on hypoxic chambers? They are certainly used for the purpose of performance enhancing. Why do you not place those on the Prohibited List? Why was the substance pseudoephedrine taken off?

Dr Ljungqvist: With regard to hypoxic chambers, I will have to avoid giving a lesson here because it will take a long time to respond. It has been in use for decades in certain sports in certain countries including my own. It has been ethically reviewed and it has been debated. It was a fashionable way of mimicking high altitude training for a long time. More and more athletes experienced negative side effects and today it is not used as much as it was earlier on. A discussion came up in WADA because certain governments wished to know for sure whether these could be included in the List or not and what the status would be for the future. They

wished to know whether they should make investments in further equipment of that type. WADA conducted an investigation and wide consultation which resulted in a clear message from our stakeholders not to include it on the List for various reasons and, if you were to ask my personal opinion, I would agree. First of all, you cannot differentiate for sure between the use of hypoxic chambers and the sort of normal high altitude training. Secondly, we could not establish that appropriate use of hypoxic chambers under medical supervision would constitute any harm to the athlete or be harmful. So, the two remaining criteria were performance enhancing and ethics. The Ethical Panel felt that it was not in accordance with sports ethics whereas others felt it was. So, there was a difference of opinion and the final outcome was the one I told you, that it is not included on the List. It has now been tested, it has been carefully evaluated and I do not think that issue will come up again. Those governments who wished to begin making investment have probably begun.

Q232 Dr Harris: What is pseudoephedrine?

Dr Ljungqvist: Pseudoephedrine is an example of a minor substance. If we are supposed to focus on the real problems—and I fully agree with Richard Budgett in what he said about that—we should try to take away all those of minor or hardly any importance. Pseudoephedrine for various reasons, scientific reasons and social reasons, was considered as such. It is widely available over the counter all around the world for any sort of minor cold, flu or whatever. It is an obvious substance which can be ingested by a simple mistake or whatever. That was one aspect of it. It has a very limited performance enhancing effect, if any, and it was deemed to be an unnecessary substance to have on the List. Now, a different scientific problem has come up which means that it is being reviewed again and there were arguments for having it reintroduced because the metabolism of the pseudoephedrine means that it can be metabolised into a substance which is on the List, namely cathine.

Q233 Dr Turner: Are there not difficulties in deciding that a substance is of minimal effect in terms of performance enhancement when, in some sports, the difference between first and second place is a fraction of a second? So, quite marginal differences can produce very big differences in reward. Does that not make it a little more difficult?

Dr Ljungqvist: It is part of the evaluation and, if you wish to take pseudoephedrine for the purpose of enhancing performance, you would rather have to take it in such an amount that you could get side effects, which is not good for your athletic performance. We had one other example where we have taken a substance of the List, namely caffeine which is a well-known stimulant to all of us but it was taken off the List for the same reasons as pseudoephedrine was.

Q234 Chairman: Before we leave this section, what is the difference between allowing hypoxic chambers to be used—and we saw them in Australia in both the major sports institutes we visited there—and allowing a controlled use of EPO?

Dr Ljungqvist: It is a huge difference.

Q235 Chairman: I am not suggesting that, I am asking for an answer.

Dr Ljungqvist: No, I fully understand. I think it should be generally understood that drugs, EPO or whatever, are intended for the prevention or cure of disease or alleviation of symptoms. It is on medical indication. As long as there is not a medical problem or a disease in a lead sport, then any such use is contraindicated and simply medical malpractice. The concept of controlled drug use for healthy young athletes should not exist. It is an impossible concept.

Dr Budgett: I would also echo that there is a difference between mimicking what is available naturally and doing something which is totally unnatural.

Q236 Chairman: Would you put laser eye surgery for an artery into that category?

Dr Budgett: Yes, that is not available naturally and, if they do not need treatment. That is the whole wrong balance—

Q237 Chairman: We will leave that hanging.

Dr Budgett: Yes, let us leave that hanging.

Q238 Dr Harris: I hate leaving things hanging. Let us not. I want to ask you about therapeutic use exemptions and I would like to ask both of you what you think the cause of this epidemic in asthma is among athletes. Previously in my medical training, I have never known it to be infectious.

Dr Budgett: It is my personal opinion that because we in this country are the most efficient at filling out these abbreviated therapeutic use exemption forms in the British team, we have a reputation of having a much higher incidence of asthma than other Olympic teams at around 20%, which is about the same as the general population. In North America, the UK and Australia, it is a similar 20% incidence mass and that is what we have. Some on the IOC and WADA were concerned at this very high incidence of asthma and I suppose it goes back to the spirit of sport where, quite rightly, you do not want a culture of everyone having a puff on their salbutamol inhaler on the edge of the pool before they set off. You can put in rules to stop that happening and they have done that in swimming; you are not allowed to use your salbutamol inhaler on the poolside because medically you do not need to, it is not the appropriate place to use it and it stops everyone from thinking that they have to have a puff on a salbutamol inhaler otherwise they are not going to keep up with the person next to them. There was a problem at one stage of this culture of, if you do not have an inhaler, you are going to go slowly. We instigated a comprehensive testing of the whole of the British team, the Eucapnic Voluntary

Hyperpnoea tests—are you familiar with those EVH tests—which is where you hyperventilate for six minutes with a CO₂ mixture, which dries out the airways and is a fantastic mimic of exercise induced asthma, a very sensitive test, and you do a flow test afterwards and you see whether the FEI falls by more than 10% which is the criteria of the IOC and that showed that we had a very similar percentage. It was very useful for us. I was doing this enormous amount of work just for these therapeutic use exemptions but we found that the vast majority were correctly diagnosed as having asthma, about 80% of those who thought they did, and we also found a number, particularly sprinters, who did not even know that they had asthma, they just thought they coughed a lot after exercise. They were therefore significantly helped by then going on to the appropriate medication. A few who had different sorts of breathing problems, they were getting a bit of Stridor or other problems, needed inspiratory training and other help. There is no doubt that it did enhance our care of the athletes but I think at a huge cost because we spent an awful amount of time filling out these forms. The whole aim of it is obviously to reduce the use of salbutamol which is anabolic in very, very high doses. Dr Ljungqvist will be able to tell us but you can pick up those very high doses and we know that above a certain level salbutamol is considered anabolic in and out of competition. And there are corticosteroids, which I do not personally think should be on the List anyway.

Q239 Dr Harris: What you are saying is that 20% of healthy non-smoking young adults have asthma.

Dr Budgett: Exercise induced asthma.

Q240 Dr Harris: And 20% of your team, as it were, having it is what you would expect.

Dr Budgett: Yes.

Q241 Dr Harris: Therefore, they should be on salbutamol in the interests of their health.

Dr Budgett: Hopefully on preventers and not needing salbutamol, of course.

Q242 Dr Harris: What about other countries? Is 20% about the norm?

Dr Ljungqvist: I would say around that, yes, and, as we all know, asthma and asthmatic conditions are increasing in society. We do not know why but probably because of the introduction of all sorts of environmental elements that were not there before and it is no surprise that asthma or asthmatic conditions, bronchoconstriction, will be revealed during exercise because it is one way to provoke the symptoms whereas those who do not conduct much exercise may not be aware that they are carrying a problem in that respect.

Q243 Dr Harris: Are you confident that, for elite athletes, every therapeutic use exemption for salbutamol type drugs is because there is shown to be proven exercise induced asthma?

Dr Ljungqvist: No. That is why the IOC decided as from the Salt Lake City games to conduct their own investigations and not accept therapeutic use exemptions issued by other bodies. We did have laboratory investigations in place in Salt Lake City, Athens and Turino in order to make sure that those who were not able to provide laboratory data confirming the asthmatic condition would be subjected to an investigation on the spot and we have actually rejected the TUEs that have been issued by other bodies because we could not confirm the asthma.

Q244 Dr Harris: Is that not a little unfair on those countries that cannot afford these sophisticated tests for exercise induced asthma that Dr Budgett described?

Dr Ljungqvist: I think it is not unfair because we give them the opportunity to have them done on the spot before the games.

Q245 Dr Harris: We have heard a number of people say that the therapeutic use exemption is a bit of a nonsense, that it is approved drug taking covered by medical certificate of questionable validity. You have been pretty firm in saying that you do not think there is a problem.

Dr Budgett: Did I say that?

Q246 Dr Harris: I used the example of asthma which is the one that is most commonly cited, that too many people have it for it to be true therapeutic use. That is what we were told.

Dr Budgett: The problem is that they should all be considered therapeutic use exemptions, not abbreviated therapeutic use exemptions, and I think that it has actually muddied the water because the IOC in asking for tests to prove asthma are effectively saying, “We want a therapeutic use exemption”, not an abbreviated one because an abbreviated one is just a rubber stamp and is a complete waste of everybody’s time. I personally think that we should get rid of abbreviated therapeutic use exemptions and actually decide whether we really want people to prove that they have whatever the condition is and that they need the medication and I would applaud the clear requirements of a therapeutic use exemption. It has been a fantastic help for people who suffer anything from attention deficit disorder to ulcerative colitis.

Q247 Chairman: That has cleared that point up. In terms of cycling, do they have the abbreviated therapeutic exemptions rather than the full test because they seem to be able to just provide a doctor’s note.

Dr Budgett: Yes and it is the same in rowing. It is a note on a form; you do not have to show that you have had a test; you just say what test you have had. No proof of diagnosis is required.

Dr Ljungqvist: May I add that I know of only one sport that has adopted the IOC principle of asking for laboratory documentation of the diagnosis and

that is my own sport, athletics. We do not accept abbreviated therapeutic use exemptions for asthmatic medication.

Q248 Dr Harris: Are doctors anywhere in the world under pressure from their medical regulators not to do the wrong thing in this respect? We have the General Medical Council here which is increasingly proactive in following up allegations of doctors not doing something that is appropriate therapeutically. There must be a number of doctors in the world who are providing rubber stamps which have been shown not to be correct. Is there any comeback? Do you know of any who are subject to professional sanction in their country?

Dr Budgett: I have never come across one although I did have a letter from the GMC a few years ago saying, as you say, that they would take appropriate measures if anyone was found to have aided an athlete in breaking the anti-doping rules. They would consider that to be a breach of the regulations.

Q249 Adam Afriyie: John Scott of UK Sport came before the committee a little while ago and said that a great deal of the dope testing conducted was pretty much useless or wasted because of the way that the tests were applied and he suggested that athletes might quite easily get around the tests. Other bits of evidence say that rather than urine tests, maybe blood tests would be more appropriate for certain types of doping. My question to Dr Ljungqvist is, what reviews have you undertaken to assess the effectiveness of the current WADA testing programme?

Dr Ljungqvist: I see in the media and it is probably the general perception amongst the average person that there is an over belief in blood testing as a magic tool for finding doped athletes. Urine is by far the best bodily specimen to use for the purpose of anti-doping analysis because the substances that are on the List and even other substances are usually eliminated, not all but most of them, via urine and they are concentrated in urine to a much higher extent than they are in blood and their metabolites are being analysed, so the blood—

Q250 Dr Iddon: I would like to challenge you on that because I have another hat, I am Chairman of the Misuse of Drugs All Party Group in this place. We know that in prisons where urine samples are taken regularly for judicial testing, it is very easy to corrupt the urine or even to switch it with a sample that does not contain the substance. Can you be absolutely sure that the sample of urine that you are taking from an athlete is uncorrupted and actually from that athlete?

Dr Ljungqvist: If I may, I will come back to that because that is a different question. I am talking about the biological science now which makes urine by far the best bodily specimen for the purpose of analysing for doping substances. It is another matter that you can manipulate the system and I may come back to that.

Q251 Dr Iddon: That is not what we heard in Australia.

Dr Ljungqvist: No, but that is what you hear from me.

Q252 Chairman: You are right.

Dr Ljungqvist: The blood testing serves a particular purpose for the analysis of certain methods and substances. Like HBOCs haemoglobin oxygen carriers, artificial haemoglobin molecules, for the purpose of analysing for growth hormones and for establishing that normal blood parameters of an athlete in order to be able to tell if suddenly on an occasion the parameters deviate from the norm which would make you target the athlete for analysis for Erythropoietin which is made on urine again. That is where the blood analysis comes into play. When it comes to the possibility of manipulating the urine, the WADA Code and most regulations at the domestic level and at the international federations' level try to make sure that the out-of-competition testing system does not give room for manipulating the urine. The out-of-competition system should ideally be that the doping control officers come and knock on the athlete's doors in total surprise in order that the athlete has no chance of making any arrangements. Even one or two hours' notice allows for the athlete to make certain manipulations himself. As you know, the urine is supposed to be collected under close supervision of a doping control officer which is an embarrassing method or procedure but it has to be done. You probably know that, in Athens, we found two Gold Medallists who did not wish to provide urine under those circumstances and they were therefore banned and their gold medals taken away from them because they were obviously trying to do what you were hinting at, namely manipulate or switch the urine or make use of artificial devices and so on.

Q253 Dr Iddon: In Australia, we came across a case of a Moslem who, for cultural reasons, refused to give a sample. If more and more Moslem athletes are taking part in various games, that provides you with a real dilemma, does it not?

Dr Ljungqvist: I think that is a very bad excuse because I have taken blood and urine samples from Moslems without any problems.

Q254 Dr Iddon: Drug testing has been going on for several years now—this is my perception and I may be wrong—and there does not seem to have been a decline in the numbers of positive results. Is that because athletes are not being put off by the fact that drug testing is available or is it the fact that you are testing more samples today than you were in the past?

Dr Budgett: We do not really know the answer to that but my opinion would be that there are many more samples being tested, there is much more out-of-competition testing, so you are more likely to pick up athletes when they are attempting to cheat. As Dr Ljungqvist said earlier, quite a few of the apparent percentage who are positive are inadvertent or very

minor offences because the athletes have taken substances which some of us do not think should be on the List.

Q255 Dr Iddon: As a chemist, I know that tests can sometimes go wrong for various reasons, either the reagents are not up to standard or the laboratory is not up to standard, and I also know as a chemist that laboratories vary in their professional character right across the world. We also saw in Australia that at the time of their games in Sydney, they had to take on an enormous number of extra people into the testing programme. How can you be sure therefore with all those parameters that can move either way that, at the time of the Olympic Games for example, the laboratories are properly accredited and all the extra people who are going to work in those laboratories are up to standard?

Dr Ljungqvist: Being responsible for the medical organisation at the Olympic Games, I hope I can give you an answer. As you know, there is a very sophisticated accreditation system in addition to the ISO system. This was established, actually, by my own federation back in the 1980s. The IAAF (International Athletics Association) established those procedures and handed over the accreditation procedures to the IOC in 1983—to be used by other sports as well, not just track and field or athletics. Once WADA was created, the accreditation system was further developed, of course, and moved to WADA. This is an annual re-accreditation system of all laboratories. It is not just that the laboratory becomes accredited once and for all; they are re-accredited every year by control samples, et cetera, et cetera. During the games, not just the staff but also the supervision of the staff is increased. To take the fairly small games in Torino, for instance, there were 10 heads of laboratories from accredited laboratories around the world which supervised the work in Torino, together with the chief of the Torino laboratory—you know, the laboratory moved from Rome to Torino. It is a very carefully structured system to make as sure as we can that this is being handled in accordance with the laboratory standards as laid down by the board.

Q256 Dr Iddon: You have never had an opportunity to criticise a given laboratory or any analyst working in those laboratories by looking at a batch of results that appeared to be suspicious.

Dr Ljungqvist: No, we have not had an incident. Not during the games, no.

Q257 Dr Iddon: That is good news.

Dr Ljungqvist: Yes.

Chairman: That is good news.

Q258 Dr Turner: Professor Ljungqvist, we are obviously thinking of 2012. Are there any specific issues the UK should be concerned about in preparation for the 2012 Olympics? What guidance will WADA and the IOC be giving to the issue of doping?

Dr Ljungqvist: We hope to be able to keep our local organising committees very well informed about any progress that is being made by us in the anti-doping fight and any new methods or new dangers that may come up. I understand that one of the problems that we may face—and you have certainly been thinking about this—is the possible arrival of the misuse of gene transfer technologies for the purpose of doping. I am very pleased to be able to tell, and have been so over and over again, that we have the top expertise in the WADA Medical and Health Research Committee to help us out with modern developments in genetic transfer technology. You have people reading newspapers, that once “gene doping”, as it is labelled, comes into sport, there will be no way of finding the cheats. We now have experts in our Committee—and they are established. We have staged two scientific conferences at the highest level, one in the Cold Spring Harbor Laboratory in New York and one at the Karolinska Institute last December. The conclusion today from those meetings is that it is not a question of whether or not gene doping will be possible to detect—it will be possible to detect—it is more a question of how and when. That is a very optimistic message that we get from the expertise in the field. This is an area where for once we can say that we are a little ahead of those who may be tempted to use that method for the purpose of doping. By the time gene doping may be there, we hope and we believe that we have a method in place to detect them and therefore to act as a deterrent. The other piece of advice, since you asked for that—if I may suggest it, and it is a bit tough to say, possibly—is that I am very pleased with the law that we have in place against doping in my country. We have a law specifically directed to the possession, distribution and even use/consumption of doping substances. We have had a law in place since 1991. It was amended in 1998. It has been very helpful to our sports organisations to have that law in place because it makes it possible for the police authorities to make searches on suspicion. It is a very efficient deterrent and also gives you very much information as to what is going on in society. Last year, we had some 1,200 occasions on which doping substances have been seized by the police or the customs in our country, in a country where I would say doping substance is very little used in sport but it is used by other people to a very large extent.

Q259 Dr Turner: You would recommend that we look at our law at the moment.

Dr Ljungqvist: Yes. There are two examples: it gives the possibility for police and customs to intervene and it is helpful to sport. We had an example of how it can work the other way around. We had the European championships in track and field in Gothenburg a few months ago and, when the games were about to close, substances and drugs and empty bottles were found in the wastepaper basket in a large container outside the location of the domicile of certain groups of athletes from certain countries. Based on the suspicion, and with the support of the law in our country, the police made an investigation

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and a serious cloud was hanging over the games. The newspaper reported on “Doping substances found” and “These are doping games” et cetera. The police investigation resulted in the conclusion that it was nothing: they were totally innocent substances.

Q260 Dr Turner: Would you like to see us put a law into the English statute book to provide the same provisions?

Dr Budgett: Yes.

Dr Ljungqvist: That is my view.

Dr Budgett: We will have to see what the ramifications of that would be, but I am sure it will be very helpful. It will send a very strong message. I was thinking about testing—we are talking about testing at the moment—and the out-of-competition testing is obviously the way ahead. It is far more effective and has a far greater deterrent effect. There are two messages we are putting over. One is a lot of tests, and because you have finite resources there is a danger they are going to be less effective. I know that a number of tests which are labelled as out-of-competition, which is what we want, in effect are on a whole group of athletes when they are easy to get hold of, so we have to be quite careful when we are building up towards the 2012 Olympics that we are doing the testing as effectively as possible and not get too worried about the total numbers. One really well-targeted surprise test is going to be far more valuable than testing a squad of 15, where they turn up for their camp.

Q261 Dr Turner: Professor Ljungqvist would it be possible to provide us with a translation of the Swedish Act?

Dr Ljungqvist: Yes.

Q262 Dr Turner: What procedures do you have for taking forward the lessons you learn from any given major sporting event to the next one? Presumably you have a structure for taking forward any responses to problems that arise.

Dr Budgett: Certainly, from the point of view of the List Committee, the stakeholders are more and more active in putting forward their recommendations and experiences and statistics and results and concerns. This large amount of information is considered very carefully by the committee and that feeds in appropriately to any changes in the list. I am sure the same will happen for the code as well—and is happening for the code.

Q263 Dr Turner: Will you be recommending a significant increase in the amount of testing of the 2012 Olympics?

Dr Ljungqvist: We will be discussing that. It is a negotiation matter, of course, with the organising committee. We are steadily increasing the number of tests for the Olympic Games from each one to the other and certainly they will be increased again, but it is not a matter so much of the increase of the testing, it is more the strategy to make use of the testing mechanism in the optimal way. Therefore, as from the Athens games, we introduced an Olympic period during which out-of-competition testing

could take place. It started by the official opening of the village until the end of the games. It included more than a month rather than the few weeks of the games. That is an example of an improvement of testing methodology.

Q264 Dr Turner: Are there any specific concerns with the British Olympic Association in preparation?

Dr Budgett: Yes. We go to a lot of trouble with UK Sport to test all our athletes at least once and some of them we test more than once in the six months leading up to the Olympic Games. That sends a very strong deterrent message, we feel. The other thing to say about the games is that obviously there are a number of tests—I think it is around 2,500—which you have to do because they are of the medal winners, fourth, fifth place and one other, and it depends on the rules. You have the fundamental ones you are going to do in competition. All the other ones you do are going to be out-of-competition and will be far more effective. Every single hundred you do is going to be a hundred more.

Q265 Dr Turner: With events like the Athletics Grand Prix Circuit, where you have international athletes moving around between games, do you test there?

Dr Budgett: Do you mean our British athletes?

Q266 Dr Turner: Yes.

Dr Budgett: Yes, they will be picked up wherever UK Sport can pick them up. Of course there is the whereabouts system, which I suppose we might talk about later. That has become more effective.

Q267 Chairman: Professor Ljungqvist, before we leave this, your answers have been very interesting but my ears pricked up particularly when you talked about manipulation and that you felt WADA were ahead of the game on that. Would it be possible to send us some evidence to back up that statement? That is a very powerful statement you have made and it is something we have never heard anywhere else. The perception is that you cannot detect gene doping and you are saying something quite different. We would be very grateful for that.

Dr Ljungqvist: I will make sure, yes.

Chairman: Thank you very much.

Q268 Mr Ffello: Good morning, gentlemen. Dr Budgett, according to John Scott, the Director of UK Sport drug-free sport programme, “UK Sport is one of the world’s leading National Anti-Doping organisations”. Would you agree with that?

Dr Budgett: Yes. I think that is a fair statement. It does not mean to say it is perfect but it is definitely one of the world’s leading anti-doping organisations.

Q269 Mr Ffello: How effective do you think it is?

Dr Budgett: It is improving. It is getting better. I am concerned that it is part of UK Sport, which hands the grants out to the sports and the individuals, so there is a potential conflict of interest there, but, as

regards the organisation of the tests, I think the training of our independent sampling officers is second to none. All of those whom I have met have been absolutely excellent, very professional, with just the right attitude. Athletes are in a difficult situation. It comes as a surprise, so you have to be quite sensitive as well as firm, and their procedures are very good as well. If you go abroad, you get sampling officers, some of whom are excellent, some of whom are not.

Q270 Mr Fello: What further could be done to improve the performance?—of the programme rather than the athletes!

Dr Budgett: Of course the other very important thing UK Sport do is education, with *100% ME* and the other leaflets. For improvement, I think it would be helpful if it were made independent, and also—which is a very hard ask—to try to get away from the feeling, as I was implying earlier, that we have to have huge numbers of tests so that our annual report looks good, but rather to go for the quality of tests, which is a difficult thing to measure and justify. As a small example, I was with the rowers last Wednesday—it was a trial, so it was out-of-competition—and they picked up about 15 rowers. That is 15 ticked-up as out-of-competition. I would much rather they had targeted four or five of those at a totally random time, when they were not coming for a trial, so they did not really know they were going to be tested. I feel that would be even more effective.

Q271 Mr Fello: Professor Ljungqvist, would you agree with that?

Dr Ljungqvist: Yes.

Q272 Mr Fello: You mentioned your concerns over the potential conflicts and I understand the Australians have a distinct body, the Australian Anti-Doping Authority, to investigate and prosecute. Do you think that is appropriate for sporting bodies or do you think it is okay for sporting bodies here to prosecute in the case of positive findings?

Dr Budgett: I think it is very hard for sporting bodies, because there is a conflict there as well. Some of our governing bodies, as you know, are very small. I am also involved with the bob-sleigh team. I have been their team doctor for many years and, unfortunately, we have had a number of positive cases in bob-sleigh. It is very hard. At one stage you are the advocate, helping the athlete, and then suddenly you are sitting in judgment over the athlete. I think that is an invidious position.

Q273 Mr Fello: Professor Ljungqvist, do you think it is appropriate for sporting bodies to prosecute in cases of positive dope tests?

Dr Ljungqvist: I think the situation varies from country to country and possibly from sport to sport. One has to have a credible mechanism in place. The most important aspect is that there should be a supreme appeal body to which anybody can appeal and which is totally independent. We do have, as you

know, in international sport, the Court of Arbitration for Sport. In my country we have a superior body, an arbitration panel, which is totally disassociated from sport as well, which takes any final decision. The first decision may be taken at the sports level. I see the conflict of interest, but it is also a matter of practicality as to what can be done.

Q274 Mr Fello: Bruce Hamilton from UK Athletics told us that he would like to see a separation of the investigation and the prosecution functions. Is that something with which you would agree?

Dr Ljungqvist: It is a matter of how much one should develop a particular mechanism, the costly mechanisms, for dealing with these matters. Again, the most important part of the whole affair is that there is a superior appeal body there that can take the final decision, to whom anyone can appeal any earlier decision.

Q275 Chairman: That does not get us away from this conflict of interest that Robert is talking about.

Dr Ljungqvist: No.

Q276 Chairman: That protects the athlete who is wrongly “accused” and therefore can make an appeal but it does not give the supporting authorities the chance to get in and question some of those decisions. You have mentioned USADA and ASADA are both being incredibly effective in taking that beyond the individual sports.

Dr Ljungqvist: Yes.

Q277 Chairman: And yet you are not supporting that view. For the record, we would like to know why you are not supporting it.

Dr Ljungqvist: No, I support it but I can see that there are difficulties in many countries to put such a mechanism in place.

Q278 Chairman: But the ideal would be—

Dr Ljungqvist: The ideal would be. But take USADA, for example, they are both investigating and prosecuting.

Q279 Chairman: Yes, but they are independent of sports.

Dr Ljungqvist: Yes.

Q280 Chairman: That is the key point.

Dr Ljungqvist: Yes.

Q281 Chairman: You would support that.

Dr Ljungqvist: Yes. Sure

Q282 Chairman: I was just trying to get that on the record.

Dr Ljungqvist: Okay. I may have expressed myself unclearly, but of course that is the ideal.

Chairman: It is me who had understood unclearly.

Q283 Mr Fello: Dr Budgett, is there anything you would like to add to that?

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Dr Budgett: No, I think that is quite clear.

Q284 Mr Ffello: In terms of the anti-doping organisations, do you think it is important to have international accreditation of the anti-doping organisations?

Dr Ljungqvist: Yes. It would be preferable. Certainly the accreditation that exists today has to be in compliance with the WADA code.

Q285 Mr Ffello: You just say it would be preferable. There is no strength of feeling behind that at all.

Dr Ljungqvist: No.

Dr Budgett: They have to be in compliance with the WADA code but I do not know that anyone is going around measuring how compliant they are with the WADA code. The ultimate sanction is a very big one, is it not, for the Olympic sports anyway?

Q286 Mr Ffello: I think UK Sport is one of the few organisations that has an ISO accreditation for its process. Is that sort of accreditation preferable or something that should be much more strongly sought?

Dr Budgett: Yes.

Q287 Dr Iddon: As I understand it, the sample taken from the athlete is split into an A and B sample. Do you have any statistics on how many false positives you get on testing the A sample? How many proceed to the B sample? Does WADA keep statistics or do we keep statistics in this country on those matters?

Dr Budgett: Yes, there are statistics.

Dr Ljungqvist: There are statistics, sure. I do not have the figures in my head but they are officially available, for sure.

Dr Budgett: It is extraordinarily rare.

Dr Ljungqvist: It is very rare. The problem, you see, is that if you have a positive A and a negative B, you do not know whether it is a positive or negative case.

Q288 Dr Iddon: What would you do in that case?

Dr Ljungqvist: If the B does not confirm the A, the case is closed as negative.

Dr Budgett: There was one recent case, was there not?

Dr Ljungqvist: Yes.

Q289 Dr Iddon: Are false positives a problem in the analytical laboratory or not?

Dr Ljungqvist: Not.

Dr Iddon: Good.

Q290 Chairman: If you do the A test, which is negative, you do not bother doing the B test.

Dr Ljungqvist: No, that is right.

Q291 Dr Turner: Could we come back to looking for new techniques of cheating. You have referred already to gene doping, which is a popular concept, but gene therapy is not really a realistic proposition in legitimate medicine yet. How likely do you think it is actually to come to pass as a technique for human enhancement in athletics? If so, how soon?

Dr Ljungqvist: My belief is that, from the scientific point of view, gene therapy will come into the hands of routine medicine within a future which is difficult to predict. It has been a promising field for many years already. There have been clinical trials, as you know, with some accidents even, that made the development stop quite considerably and then it has moved on again. But it surely is a technique that will come for use in medicine, and then, we know by experience, athletes and their entourage will be knocking on the door asking for its use for their purpose, their illegitimate purpose. There are examples of it already. There is a team which is associated with WADA in Philadelphia. The head of the laboratory is a member of the gene doping panel of WADA and he reported to us already, two years ago, that in his investigation for the purpose of improving people with muscular dystrophy by gene therapy, to promote the muscle growth, he has already been approached by coaches who have asked for his assistance and how he can make use of the progress in his research field for the purpose of making their athletes stronger. It is a true report—which is sort of worrying.

Q292 Dr Turner: Quite disturbing, yes.

Dr Ljungqvist: Yes.

Q293 Dr Turner: How systematic is WADA and is the IOC in looking for new emerging cheating techniques, techniques like the use of growth hormones and possibly cytoplasm for enhancement. Do you have a systematic scanning and research programme in place to deal with this?

Dr Ljungqvist: I would not say that we have a systematic programme in place but certainly our laboratories around the world are all alerted to keep their eyes open if they make sort of suspicious or mysterious findings, because they can establish the substances that are on the list but they can also record during their analytical procedure whether something pops up that seems abnormal. That is one aspect of it. The other is that, nowadays, through WADA, we are keeping in steady contact with central representatives of the pharmaceutical industry to be updated as to what is going on in terms of the introduction of new substances and new methods for the medical profession. One example was the Salt Lake City incident, where we found three athletes doped with a substance that had been on the market for only a few months. Certainly those athletes did not believe that we had a method in place for their analysis, but together with the producer of the substance we had already developed the analytical method.

Q294 Dr Turner: When we visited Australia, we met research groups in Sydney who were working on growth hormone measurements and they were largely WADA funded. It made us think that maybe they were part of a systematic worldwide approach. Do you think that maybe you should be doing this on a systematic worldwide scale?

Dr Ljungqvist: In an indirect way, we are, through WADA, in two respects. One is through the knowledge and input from the members of our Health Medical Research Committee, who are knowledgeable in this field and are in the frontline of science in their respective areas and they report back to us. That is one aspect of it. The other is the research grants that WADA is issuing, as you have said, where we invite people from all over the world to come to us for funding. It is interesting and very encouraging that at the last Health Medical Research Committee meeting in September when we allocated the coming year's research funds, two-thirds of those went to research laboratories which were not doping laboratories but research centres totally outside sport. We are at the frontline, I would say, in accumulating knowledge in the usual scientific way.

Q295 Dr Turner: You presumably have a systematic internal process of informing all of you laboratories of things that are up and coming.

Dr Ljungqvist: Sure.

Q296 Chairman: Dr Budgett, is that the case in the UK as well? Do we have that horizon scanning? Do we have that linked in with the Medical Research Council?

Dr Budgett: There is some very active research but I do not think it is systematic.

Q297 Chairman: Do you think it should be?

Dr Budgett: There is a danger you would be re-inventing the wheel, of course, because it is an international effort. Professor Sampson is one example, leading growth hormone 2000, who has done a lot of work on that, and we do have two anti-doping laboratories which have done a lot of work.

Q298 Chairman: I am thinking of areas, for instance, like stem cell technologies, which would be fantastic for repairing Achilles heel injuries very, very quickly and things like that. People would be able, in theory, to deal very quickly with torn muscles. What sort of contact do we have with the major research bodies?

Dr Budgett: You are absolutely right. As far as I know, there is no systematic contact.

Q299 Chairman: Do you think that would be a good idea?

Dr Budgett: It would be a good idea. From the therapeutic point of view it would be a good idea.

Chairman: It does not cost much, in fact.

Q300 Dr Iddon: One of the aims in doing this inquiry, of course, is to make the 2012 Olympics here in London famous for the sporting prowess rather than for the scandals that might emerge from doping. Could you summarise for us what the authorities should do to minimise the use of illegal human performance enhancement techniques for those games?

Dr Budgett: Education, obviously, first of all.

Q301 Dr Iddon: Should education go down to the school level, do you think, or should it just be amongst the adult athletes?

Dr Budgett: I think it should go into all those active in sport, but, in the end, the testing needs to be targeted at those who are doing sport at a very high national and international level.

Q302 Dr Iddon: The elite athletes.

Dr Budgett: The elite athletes, absolutely. It is very important that our British team is clean. That is vitally important, obviously. It is also important that we send a very strong message to the rest of the world, and that has to be in cooperation with WADA and IOC. One obvious way of doing that is to have more tests than have ever been done before. That is a tempting and simple way of doing it. As I understand it, there are going to be 4,500 tests in Beijing, so there is a nice rounding of the figure to 5,000, is there not? That would be half of the athletes at the games, as well, so half of them will be tested at some point, which is quite a nice message. But, to come back to what I previously said, they have to be targeted and know they are going to be targeted out-of-competition, so we need to make sure that we cooperate with those anti-doping agencies around the world to test the athletes in the various camps there are going to be in the lead-up to the games.

Q303 Dr Iddon: Professor, do you agree with that?

Dr Ljungqvist: Yes. Since you ask me, I feel that I am privileged in having been asked to give some advice. Thank you. First of all, you know, I believe, that during the Olympic Games the IOC is responsible for the anti-doping activities. It is often misunderstood that WADA is doing it. WADA is not. WADA is doing very little of testing; WADA is a supervisory monitoring body which issues regulation standards, et cetera. It conducts some testing on behalf of the nations or federations who do not have much of testing activities but that is about it. We do link up with WADA during the Olympic period—to come back to out-of-competition testing, as I mentioned—from the opening of the village, and we could possibly expand that, but we would have to discuss it. Surely, as Richard Burdett said, the one important part of the anti-doping work for the 2012 games should be to expand the out-of-competition testing programme considerably. It will cost a little but it is worth it, for sure. We saw the benefit of it in Athens. We found the Greek athletes, the famous cases. It was embarrassing but it is a necessity. It is a must. That is one aspect. Then we will have a mechanism in place from the part of the IOC which is routine; namely, that we include the Chief Medical Officer into the International Olympic Committee's Medical Commission as soon as that person has been appointed for the coming games. So the Beijing Chief Medical Officer is already a member of the IOC Medical Commission, so is the Chief Medical Officer of Vancouver, and, as soon as London has appointed, that person will become a member of the

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IOC Medical Commission and therefore will be continuously updated and kept involved in the planning of the anti-doping activities for the games. The third aspect—and I repeat myself a little—is that it is of the utmost help to have a law in place against doping in the host country. That is a very strong message to the athletes and it is very helpful for all organisations concerned who will be involved in the conduct of the Olympic Games.

Q304 Dr Iddon: I would like to ask a question now about something we came across in Australia. At the National Institute of Sport in Canberra they follow the athlete's biochemical patterns very, very closely throughout their elite career. They were pushing the idea, which I gather is discussed across the world, of doping passports. The argument is that a given athlete's biochemistry will differ quite considerably from another athlete's biochemistry and it will change during training as they build up to the competition. They are suggesting that unusual patterns of biochemistry in the blood or the urine can be detected by putting all the testing results and all the research results on what they describe as the doping passport. I would like to ask the two witnesses we have here this morning what their feeling is on doping passports.

Dr Budgett: I think it is a good idea. I have spoken about it to Professor David Cowan from the King's Laboratory. I do not know if he has been a witness here. One of the obvious worries is that athletes will still manipulate that profile but I am reassured that that would be a very difficult thing to do. I think a passport would be effective. It was discussed at the recent IAAF IOC meeting in Lausanne. The resources put into that would be effective and we could show a lead on that in the UK because it would be one extra way of making sure our athletes truly are clean.

Dr Ljungqvist: I agree. It should be a good tool to have in place. We have tried it in my own international federation, the Athletics Federation. It failed because of the extremely rapid turnover of athletes and keeping track of all those athletes that came and left the elite group was virtually impossible. I would say it is rather a mechanism that you could put in place at the domestic level. It was thoroughly discussed at the recent symposium, particularly with respect to a blood passport for recording parameters—for reasons which I explained earlier—but it is something that should be looked into at the domestic level. We have it in my country for blood analysis, not for further biological parameters, but that is a certainly a very useful tool.

Q305 Adam Afriyie: Despite having captained the basketball team at university, I was always more noted for my enthusiasm than my ability at sport and I am very enthusiastic and optimistic about what Britain can achieve at the 2012 Olympics. I want to turn to the more upbeat, optimistic side of human enhancement technologies rather than the cheating side and the doping side. We had some evidence from Anna Casey of QinetiQ. She said that it would be naïve to think that athletes/sportsmen

will not be using legal supplements and legal enhancement technologies to maximise their performance. Who is responsible for or takes a view on how to help athletes keep abreast of legal human enhancement technologies and supplementation?

Dr Budgett: In the UK there is no single body. It will depend on the professionals involved in that sport. I think cycling is quite a good example because they have to be open about the way in which they will go right up to the line of what is permitted and they will spend all their efforts on making sure that all the training, all the equipment, all the science is absolutely perfect, without using anything that is prohibited; the rationale being that those athletes who are cheating will be at a disadvantage because, as I mentioned earlier, they are spending an awful lot of their effort avoiding detection, worrying about detection. If you are focused on performance and you know you are producing a clean performance, in fact your performance can be just as high. Ethically and morally that is the right thing to do. We are talking about excellence here, so it is right to pursue that excellence within the framework of the rules. I do not think there is anything wrong with that. Nationally, the British Olympics Association and UK Sport work together. For the sake of our Olympic sports, we have seminars for the support staff dealing with cutting-edge stuff. It is not just the normal substances, where you might go to a sports medicine doctor; we are talking about cutting-edge ideas and ways of working. That is one way of dissipating it, but each sport is going to have different needs, so it is often on a sport-by-sport basis and it depends on the quality and experience and inspiration of those support staff.

Dr Ljungqvist: From an international point of view, the responsible body for dealing with the aspects which you are mentioning is the IOC Medical Commission. Earlier on, the IOC Commission was mostly focused on the anti-doping fight. That was why the Commission was created back in the 1960s, for the reason I gave earlier, after the death of the cyclist. Since WADA was born, the IOC Medical Commission has reoriented its attention and work, and it is now the medically responsible body for taking care of the safety of the athlete when they conduct their athletic performances under the existing rules. We are issuing position statements after having recruited the necessary international expertise in various fields. Those are always published on the website but also circulated to all the stakeholders. Could I give you some examples of what has been achieved so far. During the last few years, we have issued a statement on how to protect and avoid concussion in sport (boxing, soccer, et cetera); we have issued a position statement on how to prevent and take care of the problem of sudden death in sport—which has occurred, you know, quite a few times over the last few years; we have issued a statement and recommendations with respect to the use of food supplements; we have issued a statement on the problem with a female athlete triad, to avoid that very problematic medical disorder; and we are about to issue a statement in a

few weeks on sexual harassment and abuse in sport, which is an ethical problem in sport. The body is there.

Q306 Adam Afriyie: How would you describe the attitude of the British Olympic Association and the International Olympic Committee towards legal human enhancement technologies or supplementation? Would it be: “Yes, go ahead, use everything that is legal to the maximum to achieve maximum of your abilities”? Or is it a slightly more cautious outlook?

Dr Ljungqvist: To expose an athlete to the strain that elite training and elite athletic performance means today is risk-taking in terms of health, therefore you have to be aware of the risks and have a mechanism in place to prevent those risks from occurring. Internationally, as I have said, the IOC Medical Commission feels that responsibility, and the medical people involved at the domestic level in domestic sport feel the same, for sure. As long as the mechanisms that they are using for performance enhancing are accepted and not banned, it is automatically okay.

Dr Budgett: I would say that we are cautious and sceptical as well. As you will know, there is an awful lot of methods and substances out there that are put forward with pseudo-scientific justification—“You follow this cycle and it must help”—and we know that in effect it does not. I am also sceptical about some of the things that have been proven to be ergogenic; for instance, creatine. Most of the studies there have been done on college athletes, who are not our very elite athletes. When, for instance, the bobsleigh team I looked after used it, not many of them seem to have benefited. I think it is because you are dealing with a different group here. Everything is about as optimum as it can be, so it is more difficult to get that extra enhancement through taking supplements because of the normal homeostasis.

Q307 Adam Afriyie: Professor Ljungqvist mentioned the position papers and advice being given on concussion, sudden death in sports and some of the health issues surrounding food supplements. Is there anything that you see that is a more positive approach to the use of the legal performance enhancement? Are there suggestions or advice as to which things may be helpful and which things may not be helpful?

Dr Budgett: Yes. We have position statements as well. We still have quite a restrictive statement on the use of supplements, mostly because of the concern that they are contaminated—and that is another whole discussion and well-known problem.

Q308 Chairman: We will move on to that.

Dr Budgett: I would also mention that the IOC have produced a medical code on the ethics of looking after athletes and the health of athletes. The British Olympic Association, I think, are the first ‘national’ Olympic committee to endorse that and sign up to that IOC medical code, and it is about putting the health of the athlete first. Of course, if you do not have a healthy athlete, they are not going to perform

in the long term, so we have a duty to protect them. I also feel that athletes are a very vulnerable group, in that they are going to be looking around desperately, worrying that somebody else has an edge, so you have to have a structure in place so that they can feel completely confident that everything possible is being done for them. If a supplement is needed, that will normally be under dietician, nutrition or medical guidance, effectively, for a medical reason. It is very unusual for athletes to need a supplement. I would never go out to a squad and say, “You’ve all got to take magnesium.” It would be ridiculous. We spend all our efforts making sure they get the appropriate advice and follow it on diet, fluids, training and recovery.

Dr Ljungqvist: May I add one thing to that, so that I am not misunderstood here. I said I issued a position statement on, for instance, food supplements. If you go into the details of what we have said, we have said: “Do not take them unless you can prove that you need it”. That is important.

Q309 Adam Afriyie: What view does WADA take to the researching of new supplements? I know you do not commission it yourself, but what view do you take of research into human enhancement technologies and substances, and, in particular, substances which were on your monitored list? Clearly there may be some advantage to conducting research into these substances, but what view does WADA take?

Dr Ljungqvist: In WADA we have limited funding for research. Although between 20% and 25% of WADA’s budget goes to research—which makes me happy—the total sum is not that high. It is around \$5 million. We are using that based on a list of criteria for which we can use this amount of money. That is for developing methods for the detection of doping substances. Then we made a list of priority for which people can apply. But we are not conducting research into how to improve performance and how these substances will be working on the human body. We do not feel that is our responsibility.

Q310 Adam Afriyie: We had some evidence from Mr Brewer that WADA may be withdrawing accreditation to labs. I think there is a kite mark system or something where WADA accredit supplements or products that have been tested and shown to be contaminant free. Is that the case? Are you going to stop the accreditation of these labs, and, if so, what is the rationale behind that decision?

Dr Ljungqvist: The rationale behind that decision is that, if you test certain food supplements or are asked to test them for making sure whether they may be contaminated or not, if you find that they are not, you cannot tell that the other batches will not be contaminated so you may issue false reports and misleading reports. We have told the laboratories not to become involved into an area which is so poorly regulated at the national levels.

Q311 Adam Afriyie: You would see it more as a national level activity as opposed to a WADA activity.

Dr Ljungqvist: Yes, if so.

Q312 Adam Afriyie: When does this policy come into play? I assume labs are still accredited at the moment.

Dr Ljungqvist: It was established very early. We had a particular working group that was working for the first two years of WADA's existence which looked into the whole area of food supplements. As you know, we gave one of the laboratories the task of investigating the food supplement market. It was the Cologne Laboratory which conducted the research and accumulated large numbers of food supplements via the internet and various producers. They found that between 15% and 20% of the food supplements were contaminated by or contained banned substances which were not indicated on the labels. This is an unregulated market. We simply advised athletes of the risk of taking such things. That is what we can say.

Q313 Chairman: Is the key rationale that a WADA-accredited laboratory, like the King's Laboratory in London, cannot test any supplement so that you can be assured there will be no contamination of the samples which come from that list.

Dr Ljungqvist: Yes. That is the conditions today. I know that some laboratories wish to be able to make specific investigations into specific situations, but, if so, they had to apply with WADA to be able to do that.

Q314 Adam Afriyie: My final question is this. In terms of the legal human enhancement technologies and substances, is a positive note. What would you encourage athletes to do in order to enhance their performance using legal methods?

Dr Budgett: I am afraid I do not have any magic answers. I think it is a matter of optimising their training and optimising their recovery. There are going to be different situations. For instance, you could use a high altitude chamber if you are injured—and we would use this at the moment. Say you are a rower and you have injured your back or your legs, you can still use your arms but it is very difficult to do the same intensity of workout just using your arms. If you go into a high altitude chamber, cardiovascularly you can be forced to work much harder, so you get the same training effect, so you can maintain your training while you are recovering. There are examples like that, but, generally, it is a matter of optimising training and optimising recovery, which is all about diet, fluids and time to recover.

Dr Ljungqvist: My answer would be very short. I would recommend the athlete to have a good and honest coach who plays in accordance with the rules and learns with the athlete to play in accordance with the rules.

Q315 Chairman: Professor Ljungqvist, that is a fantastic quote on which to finish this session. Could I thank you and Dr Budgett very much indeed for what has been a really useful session for us. Thank you very much indeed for the honest way you have replied to our questions—not that I am suggesting witnesses are not honest, I should put on the record!

Dr Turner: Evasive sometimes.

Chairman: Thank you very much.

Tuesday 12 December 2006

Members present:

Mr Phil Willis, in the Chair

Adam Afriyie
Dr Evan Harris
Dr Brian Iddon

Bob Spink
Dr Desmond Turner

Witness: Rt Hon Richard Caborn, a Member of the House, Minister for Sport and Tourism, Department for Culture, Media and Sport, gave evidence.

Q316 Chairman: Good morning. I do understand, Minister, that you are on a very tight schedule. We are greatly appreciative of the fact that you have fitted us into your schedule. *Human Enhancement Technologies in Sport*, ahead of the Olympics, has been an interesting inquiry. A number of the recommendations which we are coming towards clearly need an input from you as the Minister and it would have been wrong not to have had that before doing the heads of report and completing the work. One of the areas that has arisen is the conflict between the role of UK Sport and the fact that the anti-doping programme is co-located within the same organisation as one which has the job of promoting UK athletics and, indeed, awarding grants. Do you feel there is a conflict of interest there, Minister?

Mr Caborn: No, not at all. Before we start, could I just say thank you very much for inviting me. Secondly, can I say, genuinely, that the fact that you are having this inquiry shows how importantly we take this subject of anti-doping and the whole role of WADA. It is very important that we look towards the back end of next year, when WADA will be having the international conference. I am sure that what you are going to be putting in your report will have some influence on that. I say that very genuinely because I, as the sports minister on behalf of Government, know that Parliament itself takes this issue seriously. Again, I think your inquiry underpins that. For an institution that has been there for only seven years, WADA has come a long, long way and the fact that you are doing what you are doing will continue to enhance that and hopefully will give some directions to the decisions that are going to come out of Madrid in the back end of 2007. Going back to the question that you asked, we had an independent report on UK Sport and the role in anti-doping and it found very, very clearly that there was a synergy between the two and it was the right place in which to have the whole anti-doping agency or services. Indeed, the previous Select Committee report also concurred with that. We have had a long debate about it and we believe it is the best. We do not believe there are any conflicts there. We have set up all the recommendations that came out of the report on UK Sport that was, again, put out into the public domain. It was debated by many and we believe we have a very robust system in place. I will say, Mr Willis, that probably UK Sport is the leading organisation, which is looked to around the world in many of the innovations in this area.

Q317 Chairman: Why do you think the British Olympic Association said to us: “The fact that the UK’s anti-doping programme is co-located within the same organisation which has the responsibility for the elite sort funding programme continues to be a contentious issue” and UK Athletics said, “It is difficult to have your educational supporting body being your prosecuting body”? Indeed, having been to Australia, ASADA was set up to separate the two functions and in the United States the US Anti-doping Authority (USADA) was set up to separate the two functions. Why are you so sure that we have got it right?

Mr Caborn: Because, as I say, people make those statements but what is the evidence? What is the evidence that BOA is bringing, what is the evidence that UK Athletics is bringing? I say interrogate the evidence—we have, you have, the select committees of this House have. We had an independent report, we put it out for public debate and nobody has come forward and said that there is any contamination there. There is not. I just say to people, “Put the evidence towards me.” I have asked the BOA to put the evidence: it is not there. I have asked UK Athletics: I have asked Steve Cram; I have asked Paula Radcliffe. Both of those wrote recently and I wrote to them both. Unfortunately neither of them has responded to me but I have said to them: “Give me the evidence. We will interrogate it.”

Q318 Chairman: Is perception not important, Minister?

Mr Caborn: I think perception is important. I would say that UK Sport and the role that they play in this area is second to none and, indeed, leads the world. That comes about because of the relationships within UK Sport. In terms of them running the anti-doping agency, there are Chinese walls there, as recommended in the consultants report. We have done that. I think that is absolutely watertight now. You do then get the development of the 100% *Me* programme and the development we are doing in a number of other areas, and it is that type of synergy that allows us to lead the world in terms of what we are doing as a sports organisation in this particular field. I say to any of those organisations you have quoted, “Please give me the evidence. I will interrogate it. We will do it in a public way.” It is not in my interests or, indeed, in the Government’s interest or any sport’s interest to have that question if there is evidence there.

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Q319 Chairman: Arguably the two strongest sporting nations in the world, the United States and Australia, have come to those conclusions and we have got it right and they have got it wrong.

Mr Caborn: I think the Australians go a little further. In terms of America, I am very, very pleased to see what has been happening in the US in the recent past but they came off from a different place from the one we came off and you have to judge against the circumstances of that particular nation. The US have had some real difficulties, both internally and also with some of their governing bodies. We have seen what happened on the designer drugs and the development there. They come at it from a different perspective of what happened. In terms of Australia, you are moving not just inside their organisation but on whether you are using the WADA code to police the social aspects of life as well. I take a very clear view that WADA is there to root out cheats in sport. Their core business is to stop using drugs to enhance performance. That is their job. If society wants a wider issue on the use of drugs, that is fine. If somebody is found to be using illegal substances and that conflicts with the WADA code, we will judge that: Has that been performance enhancing? If it is an illegal act, then there is a criminal law that will deal with that. We are not in the business of policing society. We are in the business of rooting out cheats in sport. That is what WADA's core function is about. What we have here, both in terms of how we have framed our laws and how we operate through UK Sport, does that in a very effective way.

Q320 Chairman: The point we are trying to make—and I do not want to labour this because I want to bring Brian in—is that UK Sport has got to you, Minister, and indeed to the nation, because a huge amount of money now, particularly from Lottery funding—from ordinary men and women giving their pounds each week—goes into elite athlete programmes. The contradiction there seems to be between one aim which says we want to win—not perhaps at all costs, but you take the point I am making: we want success—and on the other hand we are the body which has to police the very things, human enhancement technologies, which may give them that little edge. Do you accept that?

Mr Caborn: I accept you can put a case. Obviously there is a case, but that is why we set the consultants to look at it. But it is wider than that. If you look at the basic principle of WADA and the athlete, it is strict liability. If anything, they have the liability, they have the responsibility for what they put into their bodies and that is not negotiable. Through UK Sport, because of that relationship, we have been able to put a first class education and first class information system, around that athlete. That athlete is very isolated. They have the strict liability for what they put into their body and that is not negotiable—I accept that; there are no grey areas in it; they are totally responsible—but you do then have to put organisations and a supply of information around that athlete so that they can make the right judgment. I have talked to a lot of

athletes over the recent past and it is not easy for an athlete who has a very, very close working relationship with their coach to then turn round and say, “This person is doing wrong to me.” They do feel very isolated. Through UK Sport, through the *100% Me* education programme, through the information we are giving athletes, I hope that as we develop over the next 12 months, as we go into Madrid, in WADA, we will be looking at systems where the athlete can have a reporting system confidentially—this is what athletes have been saying to me—so that they can go to a secure point and raise their concerns. As I say, you leave athletes in very isolated positions with the coach, training day in and day out. It is a very tight bond that they have between them and that is sometimes where these issues go wrong.

Chairman: Thank you.

Q321 Dr Iddon: It does seem rather odd, especially since athletes are considered to be role models, particularly by younger people, that some athletes—and they are a minority, I accept that—have been caught taking drugs which are classified by the Misuse of Drugs Act 1971, and, although they are treated by their sporting authorities with suspension and punished in that way, we have not followed Italy, France and Sweden in criminalising doping and applying the law that you have just suggested we might apply. Why is that?

Mr Caborn: Again, I go back to the point I made. What is WADA there for? WADA is there to root out cheats in sport. That is their core business. If you want to police society because of substances, then, fine, we can do that. This no doubt is the discussion within WADA. My view is that there are three bases on which the WADA code is based: performance enhancing; harm to the athlete; harm to the sport. I would give far more weight to the performance enhancing of those three and I would also look very seriously at the list to tick off what I believe are some of the social drugs. That is not a majority view inside WADA but it is one I have. Why do I say that? I say it because the core business of WADA is, indeed, to stop athletes artificially increasing their performance by drugs.

Q322 Dr Iddon: According to the *Daily Telegraph* of 7 December, this month, UK Sport are alleged to be looking at criminalising doping or looking at the law in this area. Have you any knowledge of that? If you agree that they are doing that, have you been assisting in any way?

Mr Caborn: First of all, that was wrongly interpreted, to be quite honest. I asked UK Sport about that and they said that is not the case. They are not looking at criminalisation. You have to be proportionate with this. It is good that I have come to this Committee today when the 30th nation has signed up to the UNESCO Convention which means that next year we can have the first meeting of that, so at least it has now been legitimised and UNESCO will come in. With WADA—and, remember, it came out of the IOC, it came out of sport, this is a sports initiative which they started—over the recent past,

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the last two or three years, we have tried to give it political support. Absolutely central to that is that it is sport that has led, with political support. That is why we want to make sure that we continue to keep the policing and the development of WADA very much within sport. We do not want this to be overtaken by politicians or other institutions. It is very important as a principle that sport should deal with its own misdemeanour. It should not give it to a third party. There have been those who have argued the case that it ought to be taken out of sport. It is a bit like your argument with me about UK Sport. I think you want to keep politics, as it were, out of running sport but I do believe politics has a strong role to support sport. The strength of WADA is that over the last two or three years we have been able to develop a sound code but that has the backing now of politicians, even to the United Nations, through UNESCO, and I think that is a very important principle.

Q323 Dr Iddon: Just to make the position absolutely clear: the United Kingdom is not considering criminalising doping in sport prior to the 2012 Olympics.

Mr Caborn: The answer to that is: No, we are not and we will not go down that route because we think that would be disproportionate to what we are trying to achieve.

Q324 Bob Spink: I would like to look at the preparation for testing and so forth for the 2012 Olympics. We have two WADA-accredited laboratories in this country. John Scott of UK Sport acknowledged that there may be a huge increase in the number of tests required. That is really common sense, is it not?

Mr Caborn: Yes.

Q325 Bob Spink: So I would like to ask what funding and resources you expect to allocate to enable the UK to scale up its testing facilities prior to 2012.

Mr Caborn: If you are talking specifically about 2012 and the Olympics, that is the responsibility of LOCOG, the London Organising Committee, which, as you know, is chaired by Seb Coe. That will be done in conjunction with UK Sport. We will set up, in conjunction with UK Sport, through LOCOG's Chief Medical Officer. We have not done that yet but that structure will be in place. The only parallel you can draw down is what we did in the Commonwealth Games in Manchester. That was very successful. That was the Commonwealth Committee but we set up the structure here in Manchester at that time. It is a LOCOG responsibility not a UK responsibility or indeed a Government responsibility, but we will be working very closely with LOCOG's Chief Medical Officer and UK Sport.

Q326 Bob Spink: Will you be making funds available to LOCOG then to scale up facilities?

Mr Caborn: That will be part of LOCOG's budget. It will not be part of our budget. As part of the candidate file in 2004, when we made the bid for 2012, we had to put into that what our position would be on anti-doping.

Q327 Bob Spink: But you are going to make sure they are funded to do that.

Mr Caborn: LOCOG has their budget. Basically that comes out of the private sector. It is part of their budget.

Q328 Bob Spink: You will like the next question.

Mr Caborn: Go on, then.

Q329 Bob Spink: Will you be kind enough to take time out to go to Beijing to see what we can learn from them?

Mr Caborn: Beijing? Why not. Absolutely. Any time you want.

Q330 Chairman: Can you support the Committee in going.

Mr Caborn: You have just come back from Australia, I understand.

Q331 Bob Spink: Do you think there is anything we can learn from looking at Beijing?

Mr Caborn: Absolutely. We are learning all the time. This is in its infancy. If you go back and look at the press, a big article in the *Financial Times* only three years ago was saying: "Let's legalise and legitimise doping in sport." We have come a long way. We were at a crossroads then; I believe those crossroads have now been passed. We have now a very robust system in place and we will learn all the way. That is why what you are doing in this Committee could well influence what is decided at the Madrid conference in 2007—which, as you know, is a conference held every four years by WADA—which will map out the next four years and I think we can learn a lot. We have a long way to go with WADA but our direction of travel is absolutely right. We will learn a lot from Beijing, as we will from the Pan-American Games in 2007 in Rio. We will be looking at the Asian Games as well and the Commonwealth Games that take place—we did in Melbourne and we will do in Delhi in 2010.

Q332 Bob Spink: I do not know what the answer is on this particular question but I think it is something we should explore briefly. While we were in Australia we learned something that was quite interesting, that they had difficulty allowing each of the national teams to bring in their own list of controlled substances, drugs, whatever, to treat their athletes for the various illnesses that these top athletes have and all the rest of it. Before they came, they submitted lists of what they wanted to bring into the country, and they brought them in and they then had to re-export what they had not used afterwards. There were all sorts of difficulties with people turning up with things that were not on lists, et cetera, and the lists having to be checked out—that the tablets they were claiming were aspirins

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were aspirins and not something else. There were massive organisational difficulties with that and massive costs, and it struck us that an alternative to that would be to say that nobody brings anything into the country. Each of these centres has its own pharmacy; they can supply any drugs that anybody would need to treat anything. We will allow nobody to bring controlled substances into the country: they use those that are provided in this country by this country. That would be the safer and more rational way and easier and cheaper way to organise and run it all and it might help to prevent what happened in Athens where the Games were destroyed by the initial drugs scandal. Have you looked at that?

Mr Caborn: I have not but I would be very dubious about your approach to that. Another area where there have been discussions is around the question of supplements and the whole audit trail of those supplements. That has to be secure. Again, if you work on the issue of strict liability, you have to make sure the athlete is competent in what they are using. I think we have to find a solution to the problem of bringing them in rather than applying a total ban and then saying we will supply. There are a lot of problems around that. It is not something I have talked about. It is an interesting issue. I have no doubt you will look at it in your report and it is something that LOCOG can look at.

Q333 Chairman: Minister, we have two registered WADA laboratories in the UK. Where do you stand on that issue that they should do drug testing only in terms of athletes? Should they be allowed, for instance, to be able to test supplements at the same time within the same laboratories? Do you feel there is an issue there?

Mr Caborn: There is an issue, there is no doubt. WADA is raising it as an issue.

Q334 Chairman: Where do you stand on it?

Mr Caborn: I stand very clearly that I think they ought to be able to do both. I made my position very clear when I was on the WADA Foundation Board—which, as you know, I was on for a period when we had the troika of the European Union. I made it very clear that I believe you can test for both and I believe that WADA has that wrong. WADA has to look at this. WADA has to settle this. I can understand where they are coming from and they want to keep it absolutely watertight and as black and white as they possibly can but we all live in the real world and that real world says that these athletes want to use supplements. I mean, I use supplements—you know, I do a bit of running on a Sunday morning and I am not going to say I am going to be drugs tested but I am saying that supplements are good. I use supplements when I am running for the marathon and the half-marathons and they are very useful.

Q335 Chairman: But it gives an excuse for cross-contamination.

Mr Caborn: I think we can resolve those issues. There are very good audit trails. I have been to a number of laboratories now that do supplements

and they have a very good audit trail which you can go back through if there is an argument about that. WADA is concerned about whether, as it is in a WADA laboratory, that gives the stamp of approval by WADA. That is the argument. First, we have to acknowledge that supplements are used and athletes are going to use them and, secondly, we have to make sure we have a system that is watertight and has a very good audit trail. I do not believe that if you are a WADA testing laboratory that is a stamp of approval from WADA. That is not the case. That is their concern, that they give a legitimacy to it.

Q336 Dr Harris: Could I briefly return to this issue of conflict of interest. You were very clear when you said there were not any conflicts of interest that were active. I want to work out what you think the position is. Are you saying that, in your view, there is no conflict of interest and there is no perception of a conflict of interest by sharing the two functions within the same organisation? Or would you accept that there is no conflict of interest but there is a perception? Or are you saying that there is a conflict of interest or a potential conflict of interest but the mechanisms you have in place, like Chinese walls, deal with it so that it never sees the light of day in terms of affecting behaviour. Which of those three are you saying it is?

Mr Caborn: I am saying there is no conflict of interest there, in my view, and that has been interrogated on a number of occasions by different independent bodies. Secondly, is there a perception? If people keep writing articles in papers that this thing has a conflict of interest, then there is a perception out there. I cannot control that. All I can say to people—and I say it very genuinely to you as a Committee and all those who keep writing these articles, “Please bring the evidence.” We have interrogated it already: we have put it before select committees; we have put it to independent review. That has all come out giving it a clean bill of health. In fact I would argue that the fact that we operate in the way we do adds value to the services we give to the athletes we are applying the WADA rules to. I would argue that UK Sport is the leading organisation in the world in this area.

Q337 Dr Harris: I want to turn to this question of the legal human enhancement technologies. If they are legal and they are likely to be legal for ever then they are modern training techniques. We have heard that there is very little research done in this country, there is little funding for research into the sorts of physiology that is directly applicable or easily applicable to athletics, and that such research as there is is in the medical sphere, which is separate from sport, and there is not even any funding to transfer that technology into sport. Other countries are doing it, legally, with these legal methods, and we are not and therefore we are in a sense at a disadvantage. Do you accept that analysis in any way? What do you propose, if you do accept it even to a small extent, can be done to solve that gap?

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Mr Caborn: I think that is the responsibility of the English Institute for Sport. There are things we have been developing through the EIS, things like altitude chambers at Bisham Abbey; therefore they are looking at this leading-edge technology through the EIS. That is their responsibility. That is why we put EIS in the position that it is in. As you know, it is there to assist our athletes, the elite athletes, to realise their potential. It works now within the overall body of UK Sport. That is a question that I would pose to the UK Sport and the EIS and say, “Are we missing a trick here?” If we are, let us rectify that. I am not in a position to say that we are or we are not.

Q338 Dr Harris: I want to make the distinction. I do not disagree with anything you have said. The EIS uses existing techniques and applies them to elite athletes—and we will see how successful they have been in due course—but I am talking about research. EIS is not a research body which we on this Committee would recognise, and I think they accept that, but the other research councils fund physiology and healthcare—and that is fine, I am not saying that should not be a priority—but there are potential applications, even within the same university, we found at Loughborough, but there is no funding to transfer that. I am just wondering whether you think there is merit in exploring whether there should be funding identified to do that transfer of technology at an earlier stage than the EIS applying that to elite athletes.

Mr Caborn: The answer would be yes, obviously. Who would motivate that? 20% of the WADA budget is about research. At Southampton University WADA have—

Q339 Dr Harris: But that is into detection; that is not into the use of legal methods.

Mr Caborn: The answer to that is I do not know. It is an interesting one. I have no doubt I shall respond to it in your report when it comes up. It will be one of your recommendations, I have no doubt, which I shall have to look at very carefully. If that is the case, it has not been brought across my desk before, I will be honest. If we are missing that type of transfer of intellectual property, then fine. It is in many areas. There is no doubt that the whole Olympics and how it is changing the nation’s view of sport and physical activity is to be welcomed. It is really about how do we take that intellectual property of elite athletes and transfer that into the general populous. I always say it is bit like a Formula 1 car. I have said this many times: what happens in Formula 1 today happens in the luxury car market tomorrow and happens in the volume car market the day after. That is technology transfer. That is what we have to do. When they are pushing the elite athletes to their extremes, they are throwing up all sorts of information that can then be directed into wealth creation on the one hand but also the wellbeing of the nation on the other.

Q340 Chairman: That is true.

Mr Caborn: That is something that we have to manage and manage properly.

Q341 Adam Afriyie: While we are on the subject of the English Institute for Sport, we had an excellent visit to Loughborough University. It was incredibly encouraging compared to what my colleagues saw in Australia.

Mr Caborn: I assume you did not go to Australia.

Q342 Adam Afriyie: No, I did not make it—which is a shame because it was obviously a fascinating visit. When we were at Loughborough University we saw some lovely signs saying “EIS” and it seemed to exist in a virtual way but not in a physical and tangible way to a large degree. Why is it that the English Institute of Sport is divided into nine centres as opposed to a single, tangible centre with which people can identify?

Mr Caborn: If you wish me to speak for another half an hour, I can do! Under your previous administration, one of the very good things that John Major did, if I may say so, was to go out to Australia and look at what they did in their Australian Institute of Sport (which I have visited on many occasions now)—and he brought that back to the UK as a single entity. When that was put under some discussion as far as athletes were concerned and those that support the athletes, it was decided that they would move into a regional structure. Quite honestly, if you go to the AIS now in Australia, you will see they have done exactly the same: they are moving into the regions. This is an interesting point: some of them have linked that to universities—like we see Bath, like we see Loughborough—or, if you then look at Sheffield, the EIS there is a stand-alone with universities supporting that. We are still going through a bit of a learning curve but the principal decision to move from the central organisations, like you have in Australia, to the decentralised ones for each of the regions, was a decision taken against a background of consultation with governing bodies and athletes.

Q343 Adam Afriyie: And you are satisfied that it is value for money when you have got the administration and bureaucracy associated with those nine centres, and, like I say, they do not appear to exist in any markedly tangible form but rather in a virtual form.

Mr Caborn: I should tell you after Beijing and the 2012 Olympics deliver the medals. The only thing I can say to you is that, if you speak to Kelly Holmes, she will say that she came from being one of the best to **the** best, both in Paris when she ran in the IAAF the year before the Olympics in Athens and when she took two golds in Athens. She puts that down to her six or nine months or whatever it was at the EIS in Sheffield. That took her from being one of the best to **the** best in the world. That is the delivery at the end of the day. But it is a very finite line if you are going from being one of the best to **the** best, and it is whether we can wrap around our athletes that type of service. Whether we have got it right at the moment I am really not an expert to say. We will look at the results.

Chairman: Minister, on that very positive note, we will bring this session to an end. Thank you very much indeed for your attendance.

Written evidence

Memorandum from the Office of Science and Innovation

FORESIGHT BRAIN SCIENCE, ADDICTION AND DRUGS PROJECT

Foresight¹, and its associated horizon scanning centre aims to provide challenging visions of the future, to ensure effective strategies now. It does this by providing a core of skills in science-based futures projects and unequalled access to leaders in government, business and science. The current round of Foresight—launched in April 2002—operates through a fluid, rolling programme that looks at three or four areas at any one time. The starting point for a project area is either: a key issue where science holds the promise of solutions; or, an area of cutting edge science where the potential applications and technologies have yet to be considered and articulated. The Foresight project on Brain Science, Addiction and Drugs was launched in July 2005, and investigated how to manage the use of psychocative substances in the future to the best advantage for the individual, community and society. It touched upon some issues related to cognitive enhancement, which may have some applicability to the Human Enhancement Technologies in Sport that are the subject of this inquiry. While the Office of Science and Technology (as was) commissioned these Foresight reports, the views were those of the authors, are independent of Government, and do not constitute government policy.

The project looked at the future implications for society of drug use in the future. In terms of performance drugs, it concluded that²:

It is likely that we will be able to produce a wide range of cognition enhancers. They will be used as mental health treatments, and may be used more widely by healthy people to optimise their mental performance.

Cognition enhancers are likely to be developed to treat people who need to improve attention, memory, planning or wakefulness and to help people to forget, sleep more efficiently and be less impulsive. We have already seen advances in this area. Modafinil has been introduced to treat narcolepsy, while beta-blockers help reduce unpleasant memories from stressful situations.

A more immediate question is how to respond to the increasing use of cognition enhancers by healthy individuals. While modafinil was developed to treat people with narcolepsy, it can allow healthy people to stay awake for up to 36 hours. It does not yet appear to have any negative side-effects and the long term effects are not certain. If the science community discovers how modafinil works, it could herald a new category of cognition enhancement for the healthy. Modafinil itself has other potential uses. In addition to keeping people awake, it makes the user think through issues more carefully before making decisions. Decisions made under its influence tend to be less rash but take longer.

Methylphenidate (known as Ritalin) is another prescription drug that is being used off-label by healthy people as a cognition enhancer. It is being used by a small number of students in an attempt to improve exam results and by business people to improve their performance in the boardroom. Since its adoption at the fringe, following self-experimentation and word of mouth, scientific analysis has found that taking Ritalin can increase working memory. D-amphetamine also improves memory, but only for people with a certain genotype. There are other categories of drug that may improve memory.

In a world that is increasingly non-stop and competitive, the individual's use of such substances may move from the fringe to the norm, with cognition enhancers used as coffee is today.

It is unlikely that we will be able to increase the performance of our brain in all ways at the same time. It is more probable that we will develop substances that allow us to optimise the performance of our brains for specific tasks at given times, whether that is paying attention to a complicated argument, enjoying time with friends or falling asleep at the end of a busy day. Just as in recent times there has been a pursuit of happiness, in the future the aim may be optimisation of the brain's performance. Individuals will still want to avoid addiction, so the aim may be optimisation with control.

It will be important to understand the long-term effects of such substances before their use becomes embedded in business and social culture. We would also need to develop a culture to support the sensible use of cognition enhancers and minimise the risks for example; it is not clear whether such substances will be addictive.

Cognition enhancers for the healthy do not fit easily into the regulations for food, medicines for mental health or drugs of abuse. The closest fit might be dietary supplements but substances that can enhance mental performance rather than just improve well-being could have far greater social impact. Given this potential significance, it is possible that there will be specific regulations dealing with the management of cognition enhancers for the healthy in the future. These regulations would seek to minimise any risk of harms and would be likely to cover issues such as age and amount of use, use in education, the workplace and leisure.

¹ For more information on the UK Foresight programme, and for access to all reports, see www.foresight.gov.uk

² Drug Futures 2025? Executive Summary and Overview, Office of Science and Technology, July 2005.

The project also consulted with members of the public to seek their views on psychoactive substances and the future. In relation to cognition enhancers, this phase of the project reported that:

“Case studies involving cognition enhancers often led to discussions about their use being ‘unnatural’. There was little explicit moral condemnation of this class of substance, perhaps because substances to ‘keep you alert’ or ‘improve your brainpower’ are available commercially and used by the public at large. However, many participants made a distinction between the substances that are currently available, largely in healthfood stores, which are seen as natural and therefore as harmless, and cognition enhancers. The latter were seen as drugs while the former were not. The distinction appeared to be based on the nature of production undergone by a substance. A substance synthesised in a laboratory stands at one end and a substance picked from a garden or from the wild at the other. There was no clear line between ‘natural’ and ‘unnatural’.

In addition to the unnatural nature of the substance itself, its use was seen as providing unnatural advantages and this in itself was thought to carry a risk. It might be that the benefits were not seen as sufficient to warrant the potential risks involved. This is not an issue that arose in discussions of the use of psychoactive substances for recognised medical needs. However, there was clearly also a deeper fear, which attaches also to genomics, that ‘messing with nature’ can carry unspecified and perhaps dire consequences. ‘Nature’ in this context is situated inside the body and, more specifically, in the brain.”³

HORIZON SCANNING CENTRE

The Horizon Scanning Centre (HSC)⁴ forms part of the Foresight Directorate within the Office of Science and Innovation. Its purposes are to inform departmental and cross-departmental priority-setting, and to facilitate horizon scanning capacity-building being carried out by others inside government.

The HSC’s work is underpinned by its two strategic scans:

- The *Sigma Scan* is a synthesis of future issues and trends covering the full public policy agenda drawn from a range of sources (including think tanks, academic publications, mainstream media, corporate foresight, expert/strategic thinkers, government sources, alternative journals, charities/NGOs, blog sites, minority communities, futurologists).
- The *Delta (S&T) Scan* is an overview of future science and technology issues and trends, with contributions by science and technology experts from the worlds of government, business, academia and communication.

These scans, and associated material, have been used to inform this input. Again, the findings are independent of Government, and do not constitute Government policy.

Major trends in human enhancement technologies with possible implications for sport in the future

A range of technological advances are likely to offer the potential for enhancing human sensory and motor (ie skeleto-muscular) capabilities.

Sensory capabilities may be extended by devices such as artificial retinas which are sensitive to the non-visible parts of the electro-magnetic spectrum, such as ultra-violet light. Hearing ability may be enhanced or restored by cochlear implants. However, although of clear benefit in areas such as medicine and security, it is not obvious that sensory enhancements could affect general sporting performance: their applications would be likely to be limited to sports which rely on extreme visual acuity—such as shooting.

Motor capabilities which affect sporting performance could be extended by a range of ever-more capable orthotic devices, such as shoes which temporarily store energy generated by one body movement and release it later to increase the power of a particularly critical move. However there are no particular technologies that are generally applicable to all sports: any particular device or development is only likely to be of use in a particular activity. For example, adding “webbing” made of artificial skin and connective tissue between fingers might improve the efficiency of swimmers’ actions but would be likely to hinder activities requiring fine control of a few individual fingers, such as fencing with a foil. Shoes optimised for a runner will not be ideal for a shot-putter.

Advances in external prostheses (replacement limbs) are not likely to be relevant, since these are likely to be readily detectable.

There are likely to be developments in our ability to grow replacement tissues, and entire organs, including muscle tissue, from an individual’s own cells. The challenge for sport would be to detect the signs that such implants have been made. A similar challenge may exist to detect the implantation of artificial joints which might provide a wider range of movement, or greater load-bearing strength, than naturally occurring ones.

³ Drug Futures 2025? Public Perspectives, Office of Science and Technology, July 2005.

⁴ For more information on the HSC, see www.foresight.gov.uk/horizonscanning

Many technologies already exist to prevent accidental injury from sporting activities, and in some sports, such as fencing, riding, canoeing, the use of various forms of helmet, mask or padded clothing is mandated by the laws of the sport to enhance our body's natural defences against impact and other causes of injury. Improvements in the energy-absorbing characteristics of materials, and advances in the design of protective equipment, are likely to continue to offer scope for improving athletic performance whilst maintaining, or even improving, existing safety standards.

Drugs

A wide range of physical and cognitive performance-enhancing drugs already exist, and their effectiveness is likely to increase. Developments in scientists' ability to mask their presence, and to detect them, are likely to continue. Related developments in drug development, and in screening procedures, in horse and dog-racing are likely to be relevant since these sports may act as "safe" test-labs for substances and procedures before attempts are made to apply them to human athletes.

A clear trend in mainstream Western society is the increase in "off-label" use of substances which were originally introduced as pharmaceuticals but rapidly became drugs of choice for many who wished to enhance their lifestyle, or improve their mental performance. Viagra is one example of the former; the widespread use of Ritalin amongst US college students at exam time of the latter. The issue for sport is whether the increased acceptability of drug-use to enhance performance in society in general will lead to similarly increased acceptability of their use in sport. If it is common practice, and therefore, by definition, acceptable to a large minority (or even a majority), to take a pill to boost one's chances of a First Class Honours Degree at the end of many year's training, then why shouldn't it be equally acceptable to the majority for athletes to do the same to gain an Olympic Gold Medal? The tension between this attitude, and those who pursue the ideal of a "clean" Olympics are obvious.

Other S&T issues

The application of psychological theory and knowledge is likely to become more important as understanding of the effects of factors such as motivation and stress on mental and physical performance increases.

Technology can also directly affect training and preparation regimes. For example it is possible that simulations, virtual reality devices, and other forms of synthetic environments could help participants visualise obstacles, and "experience" the conditions, and so help them "learn the course" in advance. Sports which could particularly benefit from these technologies include equestrian activities, yachting and white-water canoeing.

Advances in biotechnology, in areas such as gene therapy, might offer the potential for an individual's performance to be enhanced by the insertion of genes which, for example, controlled the efficiency of some underlying biochemical reaction or metabolic activity that determined some factor, for example the rate at which muscles fatigued, or at which they recovered from exertion, which itself affected athletic performance.

Paralympics

All the S&T developments that may affect "mainstream" sport have similar potential to influence paralympic sports. However, there are also many additional areas where S&T developments might have an impact on orthotic, prosthetic and other aids, such as wheelchairs, whose use in some form or other is entirely within the laws of the paralympic sport. For example, developments in advanced materials could further reduce the weight of wheelchairs; prostheses could operate at speeds determined by the characteristics of embedded processors, control systems and mechanical actuators rather than by any human attribute. Alternatively, prostheses may be highly integrated with the human nervous system; in these cases performance of the limb is likely to be determined by the success, or otherwise, either of the surgeon joining the nerve to the device at the large-scale level, or of the scientist growing the neuro-silicon junction at the molecular scale. In all areas of paralympic sport, a similar environment to that that exists in Formula 1 motor-racing is likely to prevail: a set of rules are defined and the challenge then becomes to maximise the performance of the technology (rather than the human) within them. (This is not to deny that there is a role for either the F1 driver or the paralympian, nor that some individuals will be better in that role than others: merely that as the allowable technology becomes more complex, it becomes increasingly likely that the technology will be the dominant factor that determines the outcome of any competition, rather than any attribute of the contestants.)

RESEARCH COUNCILS

The Office of Science and Innovation funds research through the Research Councils who are submitting evidence to this enquiry. While OSI sets the overall strategic objectives and priorities for the Science Budget consistent with wider Government priorities, Research Councils are independent bodies and are responsible for detailed prioritisation within their particular areas. OSI provides three-year funding settlements to the

Research Councils, and it is they who make the decisions on the funding of research proposals, programmes and projects. They are best placed to evaluate individual proposals in terms of scientific excellence and value for money.

May 2006

Memorandum from Department for Culture, Media and Sport and UK Sport

1. INTRODUCTION

1.1 With permission from the Committee Clerk, UK Sport and the Department for Culture, Media and Sport (DCMS) are pleased to submit joint evidence to the Science and Technology Committee enquiry into Human Enhancement Technologies in Sport (HETs).

1.2 As UK Sport is the agency appointed by Government (through the DCMS) as the National Anti-Doping Organisation for the UK, it was felt that a joint submission would be logical to avoid unnecessary duplication of information in separate UK Sport/DCMS responses.

1.3 The field of Human Enhancement Technologies (HETs) is vast and constantly evolving, with new threats and challenges regularly presenting themselves. For the purpose of this submission, UK Sport and the DCMS have chosen to focus on the HETs that are currently considered by UK and international experts as the most likely threat to sport leading up to the London 2012 Olympics.

1.4 Priority was given to those HETs which are considered to be prohibited in sport, as determined by the World Anti-Doping Code Prohibited List 2006. It is recognised that a wider ethical debate is ongoing into currently permitted HETs, for example hypoxic chambers.

1.5 The structure of the submission is based on the four main topic areas as highlighted in the Committee's Inquiry announcement.

2. TOPIC 1

The potential for different HETs, including drugs, genetic modification and technological devices, to be used legally or otherwise for enhancing sporting performance now and in the future

2.1 Following detailed consultation with a number of leading experts, we have identified the issues that could pose a significant threat to the spirit of sport as London prepares to host the Olympic and Paralympic Games in 2012:

- Designer drugs.
- Hormones:
 - Human Growth Hormone; and
 - EPO.
- Blood doping.
- Genetic manipulation.
- Designer drugs.

2.2 Following the 2003 BALCO investigation and the discovery of the designer drug Tetrahydrogestronone (THG), designer drugs are considered by scientists to be a real threat to the integrity of sport. (US-based lab BALCO was identified as the source of the previous undetectable steroid THG, which resulted in Dwain Chambers among others receiving a two-year ban.)

2.3 The threat lies in designing new drugs to modify gene transcription by: interacting with intracellular receptors in common with other steroids; binding to hormone receptor elements; and activating the synthesis of one or more proteins that may be either enzymes or structural proteins.

2.4 In addition, designer stimulants acting on the Central Nervous System or the cardiovascular system to raise aggression, confidence and alertness are also a concern to scientists.

2.5 There is potential for unscrupulous scientists to design new, undetectable substances specifically synthesised to "beat the system". In addition, there will continue to be a willingness on the part of some athletes to use themselves as "lab rats" and take trial substances designed for legitimate medical therapies that have not passed the clinical, experimental stage.

2.6 Lessons have been learnt as a result of BALCO. Although THG was an agent that could, in theory, have been detected by the system, it was a designer synthetic agent that had unique properties when compared with any prohibited substances that were, at the time, being tested for. Scientists and their systems are programmed to look for and detect specific substances or anomalies within the test results. With THG, the steroid fell outside the standard detection range and therefore went undetected until an anonymous coach made its existence known.

2.7 The further development of assays that detect a drug's effect on the body's receptors are techniques that could provide a method of detection in the future to significantly help combat doping in sport. Likewise, unscrupulous scientists will be able to utilise this knowledge to create new designer drugs.

2.8 Recently, a third-generation molecule, Continuous Erythropoietin Receptor Activator (CERA), incorporating a large polymer chain, has been developed. CERA has an elimination half-life in humans that is considerably longer than the half-life of either epoetin or darbepoetin alfa. CERA may also have different receptor binding characteristics and pharmacology from other erythropoietic agents. CERA is currently in phase III clinical trials.

Hormones

2.9 The mechanism of action on the receptors is particularly concerned with small peptides acting as hormones including Growth Hormone and EPO.

2.10 Growth Hormone is a 191 amino acid long protein that is metabolised in the liver with a plasma half-life of 12–45 minutes. Humans are insensitive to cross-species growth hormones, so only human growth hormone can be used. Recombinant human Growth Hormone is a very real threat within sport. Synthetic growth hormone (Somatropin) is available to be used clinically and to be abused by sportsmen and women.

2.11 Growth Hormone acts by binding to receptors that can be found on the surface of every cell in the body, stimulating the production of several polypeptide mediators thus stimulating protein synthesis and growth. It is desirable to athletes because it may aid recovery from injury, promote strength and burn fat.

2.12 Growth Hormone is currently likely to be limited to elite level athletes as it is extremely expensive, difficult to attain and requires expert medical administration. However, there is no doubt that those athletes that do source and self administer the drug have the potential to make the playing field considerably uneven.

2.13 Another such threat is the glycoprotein hormone EPO that regulates red blood cell (RBC) production. EPO acts on erythroid progenitor cells in the bone marrow which have specific receptors for the hormone. Erythropoiesis takes place in haemopoetically active bone marrow and then the mature blood cells are released into the circulating system to provide the athlete with a greater oxygen carrying capacity.

2.14 When used, EPO has potential effects that could benefit an athlete's performance for weeks. Those well versed in misusing the substance also have the ability to control the amount of EPO they use, keeping their levels below the reported threshold for an adverse finding but promoting red blood cell growth nonetheless.

Blood Doping

2.15 As the detection and understanding of EPO has become more advanced, the mechanisms used by athletes to enhance their oxygen carrying capacity has reverted back to blood doping. Similar advances in technology have given added confidence to this procedure as the risks involved have reduced.

2.16 Autotransfusion and use of other substitutes such as haemoglobin-based blood substitutes and micro-encapsulated haemoglobin are being incorporated into this technique. The difficulty lies in the fact that an athlete growing and using their own blood makes it impossible to detect if the levels are below those reported for an adverse analytical finding.

2.17 Blood doping is used to enhance performance in endurance events by increasing the RBC content and therefore the oxygen carrying capacity of the circulatory system of an athlete.

Gene Therapy

2.18 The most publicised threat to fair play in sport is gene doping. The advent of gene therapy is a massive advance in medicine and will hopefully in the future be able to save and change the lives of many individuals who currently suffer from irreversible and incurable diseases. As with previous medical advancements, drug cheats have seen this as an opportunity to enhance performance without being detected.

2.19 The possible benefits of gene doping for athletes are increased production of a naturally occurring substance such as IGF-1 to stimulate muscle growth, speed healing and repair, or having an effect on other genes causing them turn on or off as required to enhance performance.

2.20 Is this HET a threat to sport? Currently the experts suggest not as gene therapy is still in its infancy. Medical use of gene therapy has been limited and the success variable. In many of the patients the technology was used in, the effects were either negligible or negative. However for some there were serious long term health consequences.

2.21 The potential of gene doping is currently over-played, although it will depend on how genetic modification is defined. Pharmacological manipulation of gene expression, as, for example, in the use of selective androgen receptor modulators, is likely to be a far more powerful tool.

2.22 By 2012 gene doping could be a very real threat therefore and, as it utilises natural body systems and manipulates the host's DNA, it will be difficult to detect and prove.

3. TOPIC 2

Steps that could be taken to minimise the use of illegal HETs at the 2012 Olympic Games

3.1 To combat these threats and to guard against any potential threats in the future, a multifaceted approach of prevention, deterrence and detection is necessary. While obviously a core element, an effective testing programme alone is not enough.

3.2 The harmonisation of standards for testing and laboratories is fundamental. As drug testing procedures and programmes for sport fall into line with the World Anti-Doping Code (WADC), a more intelligent and coordinated approach to testing globally will be achieved. With no advance notice out of competition testing as the priority of the Code, anti-doping organisations are working towards the implementation of athlete whereabouts systems and will continue to increase the requirement on athletes to be available for testing at any time. UK Sport has operated an out of competition testing programme with sports in the UK for more than 10 years and is currently conducting out of competition testing on over 50 sports.

3.3 Over 50% of all tests UK Sport conducts are now out-of-competition tests, with the allocation of these being increasingly governed through the concept of "intelligent testing". This focuses on key triggers within athletes' performance and training cycles which identifies areas of "maximum risk" of potential doping. This could include, for example, athletes returning from injury or preparing for major events. Through intelligent testing, UK Sport is able to maximise the deterrent effects of the programme.

3.4 As all national anti-doping organisations begin to utilise the World Anti-Doping Agency's (WADA) Anti-Doping Athlete Management System (known as the ADAMS database), they will be able to share intelligence on athletes that regularly travel abroad to train and compete, avoiding any such "doping havens" from being established. UK Sport has reciprocal testing arrangements with a number of countries and on an annual basis carry out testing in the UK for several overseas counterparts.

3.5 Global standards for laboratories are imperative in achieving consistency in analysis and detection techniques. This encourages laboratory experts to work in partnership to share their knowledge, which allows laboratories around the world to analyse and detect substances or methods that may have otherwise gone undetected.

3.6 The UK's two WADA Accredited Laboratories add great value to the global efforts to rid sport of doping. Professors David Cowan (King's College London) and David Hall (HFL) regularly attend international symposiums on laboratory and other scientific issues; they work in close connection with UK Sport to contribute to the UK's annual response to the Prohibited List review and WADC consultation; and they conduct essential research for detection of prohibited substances and methods.

3.7 Education and Information also has a critical role to play as a tool that can influence the attitudes, values and behaviours of athletes:

- it safeguards clean athletes from making inadvertent mistakes by increasing their knowledge of anti-doping rules;
- it allows young athletes to develop the skills and values necessary to make positive choices about competing drug-free; and
- it enables anti-doping organisations to expose those athletes who do not to abide by the rules by eliminating any opportunity for excuses.

3.8 In 2005 UK Sport launched the 100% Me programme to promote the clean sporting success of athletes committed to competing drug-free. 100% Me:

- Provides a platform for current British athletes to demonstrate that you don't need to use drugs in sport to be successful.
- Ensures that members of the sporting community can access the information and advice necessary to make well informed choices about anti-doping.
- Minimises the risk of inadvertent doping, and in turn, make apparent, any athlete intent on dodging the anti-doping system.

3.9 Since May 2005 UK Sport, in partnership with the Home Country Sports Councils and national governing bodies, has been able to reach over 12,500 athletes and support personnel through 100% Me, train and accredit 176 tutors from the British sporting community to deliver education to their members, and sign 36 athlete ambassadors from over 50% of sports on the national testing programme. 100% Me is widely recognised, by WADA among others, as a world leader in terms of athlete education.

3.10 In 2002, UK Sport launched the Drug Information Database—an online tool that enables athletes and support staff to check whether or not any pharmaceutical products they are taking contain prohibited substances. This has proved to be an invaluable tool for British athletes, and has recently been taken up by our counterparts in Canada. Potential partnerships with other nations are now being pursued.

3.11 The future success of any anti-doping programme rests on continued efforts in scientific, medical, social and behavioural research and development.

3.12 Since 2001, WADA has committed more than US\$28 million to scientific research. WADA is committed to increasing the volume of research dedicated to developing new and improved detection methods for performance-enhancing substances and methods.

3.13 In the UK, HFL Ltd, Nottingham Trent University and University College London Medical School were granted £212,000 to conduct research into the application of cellular chemistry and proteomic approaches to the detection of gene doping.

3.14 King's College London worked with Southampton University on a project titled GH-2004 which looked at the development of a methodology for detecting abuse with growth hormones in sport.

3.15 To better inform the education and information anti-doping programmes of NADOs, it is critical that we continue to develop our understanding of the attitudes and values that shape the behaviours and decisions of athletes that move up through the performance pathway.

3.16 In 2005, WADA contributed over US\$60,000 to social and behavioural research. This was the first year that grants were awarded for social science research and WADA has committed to further contributions in this area.

3.17 Amongst other research being conducted globally UK Sport has also committed to a long-term research programme between 2006 and 2012. This includes:

- Funding a scientific study into the detection levels needed to identify contaminants in a supplement that may give rise to an adverse analytical finding.
- The establishment of a network of social, scientific and medical academics and practitioners to develop a long term anti-doping research strategy for the UK.
- Conducting the first ever longitudinal study into the attitudes, values and behaviours of talented athletes towards anti-doping.

4. TOPIC 3

The case, both scientific and ethical, for allowing the use of different HETs in sport and the role the public, Government and Parliament in influencing the regulatory framework for the use of HETs in sport

4.1 The Government fully supports the anti-doping campaign as it makes a significant contribution to protecting the value, image and integrity of sport across all its activities.

4.2 The Government believes that the use of performance enhancing substances and methods is cheating, contrary to the spirit of fair competition and damages the value and image of sport.

4.3 The Government engages with anti-doping on two fronts. Firstly, through funding a National Anti-Doping Programme, run by UK Sport, that tests elite athletes for prohibited substances and methods and educates them on how to train and compete free from drugs.

4.4 Secondly, by entering into international agreements, and fulfilling its obligations under these agreements, which support WADA and the World Anti-Doping Programme in leading governments and sport in the fight against doping.

4.5 These agreements create obligations on the Government to contribute to the international effort to tackle drug misuse in sport which the sporting community would be unable to solve without government assistance. For example, the Government aims to reduce the trafficking of doping agents, and supports those sports that comply with anti-doping rules and procedures that meet with international standards.

4.6 The UK was one of the first governments to become party to the Council of Europe's Anti-Doping Convention (1989).

4.7 This was followed by the Government becoming one of the first signatories to the Copenhagen Declaration on Anti-Doping in Sport (March 2003).

4.8 More recently, the Government has supported the development of an international convention on anti-doping which resulted in the UNESCO International Convention against Doping in Sport being adopted at the UNESCO General Conference in October 2005.

4.9 The UNESCO Convention is a major step forward as it imposes a legal obligation on all governments to eradicate doping in sport.

4.10 Following receipt of the authenticated text of the UNESCO Convention in January, the Government completed the ratification process and deposited an Instrument of Ratification with UNESCO on 25 April.

5. TOPIC 4

The state of UK research and skills base underpinning the development of new HETs and technologies to facilitate their detection

5.1 The global efforts in research and development for anti-doping are varied. WADA has contributed millions of dollars to research since 2001 and will continue to do so in the future. Examples of the areas of interest for scientific research as funded by WADA are:

- Compounds/Methods Enhancing Growth.
- Compounds/Methods Enhancing Oxygen Delivery.
- Exogenous and Endogenous Anabolic Steroids.
- Projects Relating to the Prohibited List.
- Gene and Cellular Technologies Applied to Sports.

5.2 In the UK, there is a well established partnership between UK Sport, the WADA Accredited Laboratories and universities conducting anti-doping research. UK Sport has recently employed an Anti-Doping Information Officer who communicates regularly with WADA on relevant issues in order to respond to enquiries about substances and methods.

5.3 UK Sport nominates experts for national and international committees in order to broaden the experience and knowledge we have access to. For example, Dr Richard Budgett, Chief Medical Officer of the Olympic Medical Institute, sits on the WADA Prohibited List Committee.

5.4 David Cowan has previously sat on and been invited to the WADA Laboratories Committee meetings. He is also involved in the research around Compounds/Methods Enhancing Oxygen Delivery—“GASEPO2- A software tool for analysis of EPO images after isoelectric focusing and double blotting” Research Group.

5.5 Following on from GH-2000 study that has shown a test for GH using GH-dependent markers of GH action is feasible, GH-2004, lead by Kings College London and Southampton University, aims to validate a test for growth hormone abuse based on the measurement of two markers (IGF-1 and P-111-P).

5.6 HFL’s Gene research is in its early stages but is already proving to be an intriguing and fascinating area of research.

6. CONCLUSION

6.1 The recent systematic doping programme led by BALCO highlighted the grave reality of the lengths some athletes will go to in order to succeed in sport. Not only does this threaten the health and safety of athletes, and possibly athletes too young to have the ability to know the consequences of their choices or the choice of their coach or doctor, but it seriously threatens to undermine and damage the integrity of sport within society.

6.2 UK Sport is proud of the part it has played both nationally and internationally in the fight against doping in sport. With the support and backing of the DCMS, UK Sport has been able to implement a world class anti-doping programme of prevention, deterrence and detection.

6.3 UK Sport is recognised as a world leader in this field. Its standing internationally, and the level of expertise at its disposal nationally, ensures the UK is well placed to benefit from future breakthroughs in combating the threat of HETs outlined above and others that have yet to be discovered.

May 2006

Memorandum from Dr Andy Miah⁵, University of Paisley

Since the early 1900s, sports governing bodies have developed guidelines for the use of enhancement technologies. Typically, this has taken the form of an interest to avoid the “abuse” of medical substances and procedures, though the sports community is also particularly keen to ensure a “level playing field” in competition. In 1967, this process gained across-sport relevance when the International Olympic Committee initiated its Medical Commission, whose task was to address the problem of doping in sport. At this time—and since some would argue—the sole technologies of concern were those broadly described as medical, either substance or procedure.

⁵ Dr Andy Miah is Lecturer at University of Paisley and an ethicist with expertise in a range of issues related to sport technology. He was Co-Editor of “Sport Technology: History, Philosophy, and Policy” (Elsevier, 2002) and author of “Genetically Modified Athletes: Biomedical Ethics, Gene Doping and Sport” (Routledge, 2004). He has published around 60 academic papers and is regularly invited to speak at international meetings notably the World Anti-Doping Agency Stockholm meeting on gene doping (2005) where the first official statement on the acceptability of genotyping for sport was written into The Stockholm Declaration. In 2001, he advised the Australian Law Reforms Commission on its report concerning the use of genetic information in sport, published finally in their report “Essentially Yours” (2003). He has just completed an article that explores the socio-ethical issues related to genotyping for athletic ability.

The current international standard for doping technologies is the World Anti-Doping Code, which indicates that two of three conditions must be met in order for a technology to be banned from sport. These consist of the following:

1. Harmful to health.
2. Performance enhancing.
3. Against the “spirit of sport”.

It is widely recognised that determining whether these conditions are engaged is not simple and requires some form of discursive process to resolve. However, this process does not apply to all forms of enhancement technology, which are neither considered in relation to the Code. For instance, when a new design of tennis racquet is introduced, the anti-doping code is not engaged. Rather, the specific sports federation will consult its own guidelines on technical specifications to determine whether the innovation is acceptable. A closer connection between such enhancements and doping technologies is desirable (Miah, 2005a; Miah and Eassom, 2002).

Discussions about the ethical, legal and policy debates surrounding Human Enhancement Technologies (HETs) in Sports began in formal academic circles in the 1980s. One of the earliest publications in the *Journal of the Philosophy of Sport (JPS)* was about the emerging culture of doping in sport (Brown, 1980). Since then, the *JPS* has published a substantial number of articles about the ethics of performance enhancement, where doping has been the key case.

During the 1980s, the renowned bioethics institute, *The Hastings Center*, also undertook a study where forms of performance enhancement in sport were considered (1986–88) (Murray, 1984). Again, drug use in sport was of particular concern. The Center remains proactive in philosophical and ethical studies of sport technology, through the ongoing interest of its President, Dr Thomas H Murray, who was long standing adviser to the United States Olympic Committee and currently Chair of the Ethics Review Panel at the World Anti-Doping Agency (Murray, 1983, 1984, 1986, Parens, 1998).

Related studies of the cultural context of performance enhancement have also been relevant, but are often overlooked in the debate about the ethics of sporting performance (Denham, 1999a, 1999b). For instance, while there is considerable reference to how the media characterise the doping debate, very rarely is this media presentation taken into account in policy discussions. Thus, one could be sceptical of the claim that society broadly is unhappy about enhanced athletes. Rather, one might more adequately claim that the media discourses surrounding the doped athlete generate a justification for a culture of anti-doping (Magdalinski, 2000). The current lack of clarity on the ethics of hypoxic chambers in elite sport demonstrates that technology, in itself, gives rise to a mixed reception and that the ethical stance taken by athletes or lay spectators or sports fans is malleable.⁶ In short, there is no ethical view out there that can, without qualification, justify the current approach to evaluating the role of technology in sport. However, concerns about doping in sport also reveal a worry about the “dehumanisation” (Hoberman, 1992) of sport, where technology might reduce the athlete’s role in performance and, in so doing, diminish the value of competition. This view of dehumanisation also emerges from a “mechanisation” thesis that describes the scientification of sport as bringing about feelings of alienation—ie the manufacturing of athletes, for instance. Such an evaluation of contemporary, elite sports, describes the athlete as a product of a scientific or technological process, somehow automated in performance. A good indication of such narratives is within popular cultural texts. Indeed, this very notion is typified in one of the Rocky films, where the Russian, doped athlete is presented in precisely these terms, a cold, machinic, performance body, which is contrasted with the “natural”, virtuous “hero” of the film, Rocky Balboa. While this example might be treated lightly, it should be noted that various studies on the ethics of medical enhancements have turned to cultural texts such as the Rocky movies to develop further understanding. In particular, the ESRC Centre for Economics and Social Aspects of Genomics has recently undertaken extensive research investigating film narratives on genetic technology in their “Media, Culture and Genomics” project. I would suggest that any public engagement programme on the use of HETs in Sport consider how to utilise cultural texts to promote public debate on this subject.⁷

Elsewhere, I have argued that the “dehumanisation” thesis about sport and technological progress is neither accurate nor critical, but is a historical consequent of disenchantment with grand, technological progress. Thus, one might describe a sense of anxiety over tampering with biology on a global scale. This contrasts with the pervasive acceptance of smaller scale technologies that have become an integral part of daily life, such mobile phones or the Internet. A further example that raises questions about whether there is a broad social concern about enhancement technologies is cosmetic surgery (or more broadly body modification). Very little is known about whether athletes would utilise elective reconstructive surgery for sports performance. While one might immediately consider cosmetic interventions given the importance of

⁶ This comment relates to a debate between sports scientists/medics and the World Anti-doping Agency in April 2006. The WADA Ethics Committee concluded an inquiry into hypoxic (altitude) chambers, indicating that it would be consistent with anti-doping rules to include such chambers within the World Anti-Doping Code. This outcome is currently in dispute by a range of professionals, since most sports authorities currently permit such technology and WADA is now consulting with stakeholders on how best to proceed.

⁷ I also note that, in 2004, one novel on the subject of enhancement in sport was published (Joseph, 2004) and I am consulting for one screen-writer who currently has a screen play under review with a Hollywood studio.

gaining sponsorship within the sports world, one might also envisage other surgical procedures that could enhance the body. Indeed, there is some evidence of athletes undertaking risky, experimental surgical procedures when injured, hoping that their ability will be restored. In some cases, there is even anecdotal evidence to suggest that the athlete performs better after the procedure. A related case that has been discussed widely is LASIK eye surgery to attain perfect vision, a form of enhancement that is not prohibited by sports governing bodies, but which further emphasises how blurred the boundaries are between sports and non-sports interventions.

Various scholars have attempted to develop a conceptual, ethical framework for distinguishing between different kinds of technologies. For instance, one might make an ethical distinction between isolated and systemic interventions, the latter of which might be perceived to have some greater bearing on the stability of biological systems. Thus, cosmetic interventions might be seen as less problematic than, say, drug use or genetic interventions, because they do not affect the stability of biological processes. However, further work on this area should take place, with particular attention given to the legal framework for implementing the outcome of such discussions.

It would be of value for the inquiry to tease out some of these views on the use of various kinds of technology in sport. After all, the way of dealing with various sport technologies in sports has not been particularly systematic, nor wholly dependent on establishing what are the major ethical concerns absent of any social context. For instance, in the 1980s, the introduction of carbon-fibre pole vaults would appear to have enhanced the practice of pole vault by allowing a more skilled performance. Before then, the pole's stiffness was an inhibitor to technique. Alternatively, the transformation of the javelin in the 1980s was necessary since throwers were beginning to throw dangerously close to the spectators. As such, the transformation of the javelin was a relatively pragmatic choice—it was much cheaper to change the technical requirements of javelin throwing than to change the length of all athletic arenas around the world.

An alternative example demonstrates how decisions about technological change in sport are also inherently political. Thus, in the late 1990s the International Tennis Federation wanted to address the dominance of the serve in the male pro-game. One of its concerns was that the inability to return powerful serves would make the sport less interesting to watch. In turn, this could translate into fewer spectators, less revenue, but perhaps more seriously less of a grass-roots base of participants that would enable the sport to flourish. Each of these concerns are relevant when thinking about the use of enhancing technologies in sport, though they also raise potential conflicts of interest. For example, consider the influence of television scheduling on sports like marathon running. While marathon runners might prefer to run in the morning or at a time of day where the temperature is moderate, often television companies will wish for scheduling to take place at a time that is optimal for viewing figures.

Since 2002, a major enhancement issue for sport has been the potential use of genetic technology. Various descriptions include gene therapy, gene transfer or “gene doping”, this subject continues to draw speculations about whether the end of sport is nigh. These claims rely on an assumption about the impossibility of detecting for genetic and other future enhancements, thus making the practice of anti-doping somewhat futile. However, a deeper claim relates to the integrity or character of sports, where there remains a strong tension between what might be described as traditional versus a technological character for sports. In 2004, Miah’s “Genetically Modified Athletes” proposes that sport should soon enter a transition phase where the dominant model of anti-doping is brought into question as a result of changes to technology policy outside of sport. Current WADA intelligence suggests the prospect of detecting genetic interventions, though it remains unclear whether all forms of genetic doping can be detected. One might argue that if some kinds of enhancement cannot be detected, then this would render an anti-doping policy ineffective and inconsequential.

A related set of questions arises in the context of genotyping for athletic capacity. In 2004, the first commercial genetic test for sports performance was developed, and, in 2005, WADA’s Stockholm Declaration concluded with a strong discouragement over the use of such technology for discrimination or selection. In April 2006, a working group of the British Association of Sports and Exercise Sciences has begun to work on this issue. I am a part of this group.

There remain questions over whether there is satisfactory cooperation from biotechnology companies and, indeed, scientists and medics who are working on novel interventions for enhancing performance or relieving injury symptoms. This topic alone also causes some difficulty for the world of sport since the distinction between therapy and enhancement is unclear. Questions also remain about how to distinguish between natural and unnatural interventions. For instance, the development of “functional foods” could present problems for clarifying differences between food products, nutritional supplements and doping substances. Finally, there seems a need to develop a structure within the world of sport that can protect the integrity of health-care professionals’ decision making, which can often be under pressure from commercial and competitive priorities.

 CONCLUDING COMMENTS AND RECOMMENDATIONS
Science Communication Strategy

One of the major weaknesses in the world of sport concerns the communication of science, medicine and technology. If one examines the development of this work outside of sport, then it is clear that sport has a lot to do to catch up with these debates. An explanation of these circumstances is possible on the basis of the kinds of practices that sports are (private predominantly) and the development of sports studies/science programmes. I am unaware of any sports programme that includes Science Communication or Public Engagement within the curriculum. Only recently have critical ethical debates emerged within Professional Bodies, in part because of the emergence of a critical mass of Sport Ethicists who are interested in science and medicine. Within anti-doping debates, it is often discussed that “education” is necessary, yet there is a particularly didactic form of education that often takes place. Further consideration of various models of education and communication should constitute any form of public debate. Rather than begin educational praxis with an expected end learning point in mind (such as the informed choice to not dope), policy should allow the development of a critical, informed opinion about enhancement in sport. The consequence of such proposals might certainly be a challenge to established rules and guidelines on enhancement within sport, but this, in itself, cannot be seen as negative.

External Audit

The regulatory structure surrounding the discussion of this subject should be subject to external scrutiny. For example, in the case of gene doping, one might imagine that the Human Genetics Commission should be invited to contribute to the debate. Second, a regulatory structure should be brought into place that allows for the ongoing inquiry into ethical debates concerning performance in sport and this should be distinct from, but also involve, doping technologies.

Related Stake Holders

UK

British Association of Sport and Exercise Medicine (BASEM)
 British Association of Sport and Exercise Sciences (BASES)
 British Philosophy of Sport Association (BPSA)
 UK Sport

International

World Anti-Doping Agency
 International Olympic Committee
 International Sports Federations
 American College of Sports Medicine
 European College of Sports Science
 Canadian Centre for Ethics and Sport
 A range of national anti-doping agencies.

Professional Bodies

International Sports Engineering Association (ISEA)
 International Sports Law Association (ISLA)
 International Association for the Philosophy of Sport (IAPS)
 Australian Institute of Sport

Non-Sport

Nuffield Council on Bioethics
 Australian Law Reforms Commission
 United States President’s Council on Bioethics

May 2007

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Memorandum from the Research Institute for Sport and Exercise Sciences, Liverpool John Moores University

HUMAN ENHANCEMENT TECHNOLOGIES IN SPORT

EXECUTIVE SUMMARY

1. The Research Institute for Sport and Exercise Sciences has a range of research programmes that impinge on human enhancement technology. These are mainly focused on training, nutritional and behavioural manipulations.

2. Virtual reality environments may be employed to improve both physical and cognitive capabilities. Training programmes incorporating computer games may be adapted from clinical contexts for use by athletes utilising sophisticated mobile platforms. This system may be utilised alongside film-based training simulations to enhance decision-making capabilities in sports.

3. Athletes are continually in tune with the potential of ergogenic aids to help them achieve their goals. The adverse health effects of substances such as clenbuterol would render such drugs unethical, even if they were not illegal. Athletes are swayed in use of over-the-counter drugs by whether ingredients are included in the doping list. Such labile attitudes were evident after caffeine was removed from the list of prohibited substances. Use of creatine-loading is considered ethical by practitioners.

4. Evidence is presented that caffeine, theophylline, alkalineisers and creatine can positively alter physical performance capability. Caffeine can elicit cognitive improvements but no such benefits have been observed with taurine ingestion. Melatonin is currently being examined as a putative ergogenic aid when exercising in the heat but its benefits are questionable.

5. Athletes are commonly expected to compete in challenging environmental conditions. Environmental chambers are increasingly employed in the preparation of athletes for such environments. Tolerance to heat and altitude can be improved by "acclimation" in such artificial environments. Since such simulations lead to physiological adaptations over and above normal training, the ethical aspects of such practices are under scrutiny. Pre-cooling manoeuvres to effect acute improvements in the capacity to cope with heat stress seem ethically acceptable.

6. Pharmacological measures are increasingly advocated to help travellers cope with the disruption to their performance capability after crossing multiple time-zones. The phase-response curve of melatonin makes it difficult to administer this hormone as a phase-shifting method to accelerate adjustment to the new time zone. Light boxes that administer appropriate stimulation at the correct circadian times may be effective, but exposure to and avoidance of natural light are the preferred strategies.

INTRODUCTION

The Research Institute for Sport and Exercise Sciences has a range of research programmes focussed on human performance from different disciplinary perspectives. These activities are dispersed across three main sub-areas, namely exercise performance, health, and chronobiology. The exercise performance sub-area is the one that is directly related to the elite end of the spectrum. Contributions to enhancement of human performance are generated from the other research groups, notably the knowledge base to maintain performance under thermal fatigue and environment stress. Further, research concerned with activity and health, and human ageing produces findings that have implications for high-level performance.

The evidence presented is restricted to the potential for human enhancement technologies to improve sports performance. Technology is interpreted as the application of science: the technologies associated with our programmes in molecular biology and bioengineering are omitted from consideration since research outputs in these areas appear in the conventional scientific outlets.

A VIRTUAL REALITY TOOL FOR TRAINING AND TESTING CORE STABILITY

Introduction

1. In conjunction with the Royal Liverpool Children's NHS Trust, Alder Hey, the biomechanics research group has devised a balance training protocol which provides real time visual and somatosensory feedback in a multi-task environment. The primary expected benefits are the improvement of core and peripheral stability which lead to better balance, posture and movement in disorders such as cerebral palsy.

2. The potential for balance training was realised in the clinical context of cerebral palsy (CP) whose effects include loss of selective muscle control, muscle imbalance and deficient equilibrium reactions. The manifestation of these abnormalities around the low back and pelvis can be related to the concept of core stability which is defined as the ability of the lumbopelvic hip complex to resist buckling and to remain in equilibrium during external perturbations.

3. In spite of the primary damage to the central nervous system, motor function can be improved by controlled exercises and this gives rise to various training methods in CP aimed at improving core stability. Several methods exist for quantifying core stability including strength measurement and electromyography of lumbopelvic muscles. In our laboratory, a virtual reality game employed a multiple-task driven visual and somatosensory bio-feedback environment that was expected to serve both as an assessment and training tool for core stability in CP children. The engaging power of a virtual reality game can be used to measure and potentially improve core stability and general movement function.

4. The method entails standing on a CAREN movable platform (MOTEK, Amsterdam, Holland) facing a video screen, wearing a safety harness. The 3D position and orientation of the pelvis is calculated by a Vicon motion system in real time from reflective markers mounted on the two ASISs and the sacrum. Antero-posterior translation of the pelvis increases/decreases the forward speed, sideways translation drives the sideways speed and anterior/posterior pelvic tilt controls the ascent/descent speed of a virtual "magic carpet" in a real-time dynamic computer game involving a sea with islands, visualised in stereo.

5. In this early work, core stability was assessed by quantifying the movement patterns of the pelvis embedded in a multiple task setting, rather than by quantifying the underlying mechanism of muscle activity. The differences in movement strategies between the healthy control and the patient suggest that the method can be used to evaluate core stability. The complex virtual reality environment providing concurrent tasks is expected to train the patient for the functional demands of daily living. Future studies will examine the degree to which any improvement in core stability is carried over following training and whether it has a beneficial effect not only on posture but also on balance, co-ordination and other functional activities. It has likely implications beyond the clinical context to preparation of athletes for competitions.

6. Conclusion: this moveable platform, controlled by computer has great potential for enhancement of capabilities in a virtual reality environment. Conditions can be created whereby decision-making capabilities can be trained. At present there are only seven of these systems available worldwide and their application to sport and exercise science is in its infancy.

PERFORMANCE ANALYSIS

7. Much of our research programmes into improving human capabilities have been concerned with harmonising sports equipment and the individual's characteristics and capabilities within an ergonomics framework. There is also a considerable effort to optimise training practices and procedures with a view to optimising performance. The details of interventions are fed into counselling services we provide for practitioners and in their continuing professional development programmes. The most effective means of individual improvement are observed with performance analysis methods, when outcomes are presented as feedback to the performer.

Developing anticipation and decision-making skill: cognitive interventions

8. The ability to make decisions under pressure is fundamental to elite level sports performance. There is growing awareness that perceptual-cognitive skills such as anticipation, decision-making and situational awareness are essential pre-requisites for skilled performance. Elite performers develop sophisticated, task-specific knowledge structures as a result of extensive practice that enable them to deal with situations in a more effective and efficient manner than less elite counterparts. Elite performers search the visual scene in a selective manner, focusing their attention on relevant rather than irrelevant sources of information. Moreover, experts are more aware than novices of the likely events that may unfold in any given situation and are better at picking-up key contextual cues (eg, postural cues from an opponent) so as to facilitate situational awareness and anticipation of events. These skills are coupled with an extensive knowledge of

available strategies and tactics and how these may be implemented in any given situation. It is also evident that successful performance in high level sport depends on an individual's ability to deal effectively with stress. Although researchers have shown that stress can lead to deterioration in perceptual, cognitive and motor performance, our evidence suggests that elite performers are less inclined to suffer the negative consequences associated with stress by developing effective emotional control strategies.

9. The prototypical experimental approach has been to capture the performance environment using either film or virtual reality simulations. Performers are typically asked to imagine themselves in the real-world situation and to make the correct decision quickly and accurately. A range of performance measures may be recorded during performance including response time and accuracy, heart rate, galvanic skin response, eye movements and concurrent verbal reports. These measures provide an indication of how skilled athletes differ from less skilled counterparts and provide a principled basis for designing systematic training programmes to enhance such skills. A combination of film- and virtual-reality based training simulations may be used coupled with instruction and feedback relating to successful performance strategies to enhance the underlying knowledge bases and provide an opportunity to experience the demands typically faced in the competitive situation under controlled laboratory conditions. The level of instruction may also be varied (eg, explicit instruction, guided-discovery learning, discovery learning) so as to create optimal conditions for learning and transfer. Our research team has already used these types of approaches to improve performance in many sports.

DRUGS AND NUTRITIONAL SUPPLEMENTS

10. The search for nutritional supplements to complement training is ingrained among practitioners. It is inevitable that athletes seek substances that have ergogenic properties, especially when faced with aggressive marketing that makes strong claims for the products concerned. Our experience with some of these drugs embraces substances that are on the banned list of IOC.

Clenbuterol

11. Anabolic adrenergic agonists selectively stimulate β_2 -adrenergic receptors (β_2 -AR) and induce protein accretion. These agents also stimulate lipolysis and because they lack androgenic side effects they are particularly attractive to female athletes. Clenbuterol is possibly the most potent and most frequently investigated β_2 -AR agonist. Administration of large doses (eg $1 \text{ mg} \cdot \text{kg}^{-1}$ body weight) of this agent to livestock or laboratory animals induces significant growth of the heart and skeletal muscles. But, such administrations also induce significant myocyte death (apoptosis and necrosis) in striated muscles and increase the collagen content of the heart. Through meticulous investigation we have discovered a dose ($10 \mu\text{g} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$) of clenbuterol that induces muscle growth but is not myotoxic, and this is similar to the maximum tolerable dose for humans. Infusion of this non-myotoxic dose of clenbuterol significantly increases (20%) the size and protein content of the skeletal muscles and this is associated with preferential hypertrophy of fast contracting myofibres. The peak power output of clenbuterol-treated muscles increases in parallel with muscle hypertrophy but their resistance to fatigue is diminished, and when compared to controls clenbuterol-treated animals have a lower maximum oxygen uptake. Moreover, despite negation of the overt myotoxic effects of β_2 -AR agonist administration, molecular markers of pathology were detected. Differential analysis of the cardiac proteome of saline- and clenbuterol-treated animals revealed significant modification of the blood protein, albumin. Mass spectrometric analysis identified this modification as acetylation of a lysine residue but it was not possible to determine which lysine residue was acetylated. Acetylation of the N-terminus of albumin is used as a biomarker indicative of heart failure, whereas, acetylation of other lysine residues within the protein is associated with an attenuated capacity of albumin to transport toxins such as bilirubin. These findings corroborate our previous studies and demonstrate the adverse effects of agents such as clenbuterol on performance and health.

Over-the-counter stimulants

12. The use of over-the-counter (OTC) stimulants by athletes was prohibited in sports competition until recently. In 2004 many OTC stimulants were removed from the World Anti-Doping Agency Prohibited List (WADA, 2004). Common OTC stimulants such as pseudoephedrine, phenylephrine, phenylpropanolamine and caffeine were placed on a monitoring programme, but their use by athletes was not restricted. The aim of the WADA Monitoring Program is to observe the use of such substances by athletes through the examination of in-competition drug tests carried out by WADA accredited laboratories. Current research at LJMU is attempting to examine the impact of these changes to the Prohibited List on the use of OTC stimulants. The current work is able to support the Monitoring Program laboratory data through assessing athletes' current use of these stimulants, reasons for use, knowledge and education regarding the Prohibited List and Monitoring Program and views on the changes made by WADA. Preliminary data suggest that 36.2% of respondents believe OTC stimulants to have performance enhancing properties and that pseudoephedrine is the most popular OTC stimulant used by athletes (23.2% of athletes having used it in the last 12 months). Whilst their ergogenic properties are equivocal, the removal of many OTC stimulants from the Prohibited List has led to a sharp rise in their use by athletes for performance enhancement.

Caffeine

13. As a common constituent of food and many OTC preparations, caffeine is particularly open to misuse in sport due to its apparent ergogenic properties and following its removal from the WADA Prohibited List. Indeed, the rise in the “Energy Drinks” market in recent years has seen a concomitant rise in the association of such manufacturers with sport. Current research at LJMU is examining caffeine consumption amongst sports competitors at all levels, specifically the use of caffeine in sport for performance enhancement. Preliminary results show that from a specific group of athletes ($n = 83$) 63% used caffeine for performance enhancement reasons and 17.5% had increased consumption post-2004. Coffee, energy drinks and caffeine tablets are the most prevalent of the caffeine products used.

14. Despite caffeine being so widely used by the general population, the evidence suggests a significant increase in its use in sport across all levels. Evidence of adverse health effects are limited. Together with the deregulation of other stimulants, the combined use of OTC stimulants for human enhancement purposes is extremely likely. Further research is warranted to assess the physiological effects of such combinations.

Caffeine and creatine

15. Caffeine and creatine are currently being used by elite football players, separately or in combination. Their use does not always coincide with scientifically established loading regimes. Significantly faster 15-m sprint times have been observed in our University 1st and 2nd team players during simulated football activity on 5 mg/kg caffeine one hour before exercise compared to placebo (double blind cross-over design). Time to fatigue after shuttle runs (20-m at 55% then 90% VO_{2max} pace) was increased with caffeine. In a study of full time academy and reserve players from Wrexham FC, ball dribbling and 15-m sprint times were faster after simulated football activity when 5 mg/kg caffeine was consumed 60 minutes beforehand. Elite road runners have produced significantly faster times during a 10-mile treadmill run after ingesting 5 mg/kg caffeine one hour before exercise.

Creatine and Carbohydrate

16. Ingesting 10g creatine together with 200g carbohydrate immediately after 90 minutes of football-simulated activity resulted in improvements in a football skills task and time to fatigue 24 hours later compared with 200g of carbohydrate alone. Neither of these manipulations is thought to be unethical by practitioners (evidence from practitioner focus groups).

Alkalinisers

17. A dose of 0.5g/kg sodium citrate improved 5,000-m rowing performance significantly in six experienced male rowers. It was observed in a study of elite 400–800 runners that a dose of 0.3g/kg sodium citrate ingested three hours before five 30-s sprints on a non-motorised treadmill resulted in higher power output in the 3rd to 5th sprints. Whilst a 0.3g/kg dose of sodium citrate ingested three hours before an anaerobic capacity test enhanced time to fatigue, ie 20m shuttles at pace of 120% VO_{2max} . Blood pH and bicarbonate were higher pre-test with citrate ingestion.

Other methylxanthines

18. Theophylline has got properties that suggest its potential ergogenic uses. Our observations on six subjects cycling to voluntary exhaustion indicate it increases arousal of the central nervous system. Its metabolic effects are not as great as caffeine and its alteration of physiological responses to exercise are relatively minor.

Taurine

19. Taurine is included in some commercial drinks, with claims that it is the main arousing ingredient in the fluid. We have conducted a study in which cognitive functions tests were employed concomitantly with exercise sustained for 90 minutes. There was no evidence that cognitive performance was any better under the taurine condition compared with a placebo.

Melatonin

20. This hormone is secreted by the pineal gland and it has both soporific and chronobiotic properties. It is marketed for resynchronising circadian rhythms, has purported health benefits due to its anti-oxidant properties and could help or hinder performance. We have had negative findings with melatonin on long-haul flights with athletes, due to the difficulties of timing its ingestion according to its phase response curve. Whilst it has soporific effects that induce drowsiness and impair psychomotor performance short-term, there are no hangover effects after night-time ingestion. There are, however, other possible uses for melatonin such as when exercising in the heat. We have shown that there is an increase in blood flow to the skin during sub-maximal exercise in the heat. This response helps to reduce the rise in core body temperature and

increases thermal comfort. We have not yet examined whether it allows the performer to tolerate a higher core temperature prior to hyperthermic fatigue and whether it compromises the safety of the athlete in such circumstances.

IMPROVING ENVIRONMENTAL TOLERANCE

21. Participation in exercise in unaccustomed environmental conditions can be impaired. Preparation for training and competition in such environments can improve performance and increase safety. This realisation has led to the use of environmental chambers in which physiological adaptation is achieved and tolerance to environmental stress is increased.

22. Currently the use of hypoxic tents and chambers for simulating altitude are under scrutiny by the World Anti-Doping Agency. Our observations on mountain marathoners have indicated subjective benefits of periodic exposure to normobaric hypoxia in an “altitude chamber” simulating 3,200 m, where the timetable was insufficient to alter the oxygen carrying capacity of the blood.

23. Acclimation in a heat chamber can produce positive effects that improve the capability to tolerate heat loads. Nine 50-minute exercise sessions spread over two weeks in about 30°C and ~ 80% humidity have been effective in inducing adaptations comparable with natural acclimatisation.

24. An alternative means of improving heat tolerance is to increase heat storage capacity by pre-cooling the body before exercise commences. We have confirmed the ergogenic benefits of pre-cooling strategies, and the reduced risk of hyperthermic fatigue; such benefits may be reversed in competitive games in the heat when the body cools down during a half-time break. In such circumstances, a second cooling manoeuvre may be necessary. At present we are adapting this strategy to enhance the performance of fire-fighters.

Jet lag

25. The sensation of jet lag is not related closely to decreased motivation, to altered appetite, or to changed bowel habits; rather, it tracks the sensation of fatigue. In addition, in the morning it reflects problems with the sleep just taken; in the evening, problems expected with the forthcoming sleep. Jet lag is experienced by travellers crossing multiple time-zones and can adversely affect human performance. We have found it possible to accelerate adjustment to the new time zone by modifying behaviour and exposure to light rather than use pharmacological means. For athletes, a faster adjustment means quality training can be re-introduced and performance capability restored.

26. In the first days after a time-zone transition, important mental and physical tasks should be timed in the new time zone to take into account the unadjusted body clock. Poorer performance should be expected—not only due to the change in time zone but also due to the loss in sleep and effects of fatigue, and individuals should be prepared for them. This advice applies also to preparation for an event, where poor performances will have a negative impact upon individuals.

27. There is insufficient evidence to provide a rationale for the use or avoidance of sleep-inducing (such as benzodiazepines) or alertness-enhancing (such as modafinil) drugs; the problem is not their short-term effects but rather if there are carry-over effects and longer-term side effects (like dependency). Caffeine seems to be acceptable as a stimulant, if taken in moderation. Melatonin is widely used, but its lack of licence raises other problems, and trials of any long-term effects are still awaited. Melatonin might also promote adjustment of the body clock to the new time zone, but clear evidence on this is lacking.

28. A natural method for adjusting the body clock is by suitable timing of exposure to/avoidance of bright light (outdoors) in the new time zone. Physical activity can be coupled to this light exposure, not necessarily because exercise promotes adjustment of the body clock but rather because it gives a purpose to being outside in the bright light.

May 2005

Memorandum from Professor M R Yeadon and Professor R J Maughan, School of Sport and Exercise Sciences, Loughborough University

HUMAN ENHANCEMENT TECHNOLOGIES IN SPORT

BIOMECHANICS

Improvements in performance in technically demanding sports such as gymnastics have been largely based upon an improved understanding of the mechanics of specific skills. Computer simulation has proved to be a useful tool in this endeavour allowing the consideration of alternative techniques without the inherent risk of experimentation. Currently there is a virtual reality system being developed at Loughborough by Professor Yeadon which allows a gymnast to learn how to maintain visual contact with the landing area throughout a twisting somersault.

IMMUNOLOGY

Keeping athletes healthy when training and competing at the highest level is a major challenge. The physical and life stresses associated with high level competition can result in immune suppression, leading to increased susceptibility to minor infections illnesses. Although minor in themselves, these infections can limit, or even prevent, performance. Many of the recommended strategies are ineffective, and some are potentially harmful. Nutritional and other strategies to limit immune impairment in athletes are being developed at Loughborough by Professor Mike Gleeson, Dr Lettie Bishop and their research team.

NUTRITION AND HYDRATION

Good nutrition and hydration practices can offer effective alternatives to doping. Nutritional and other therapies being developed for the recovery of muscle function after traumatic injury can offer opportunities to the athlete, whether injured or not, to enhance performance. The formulation of most sports drinks is not tailored to the needs of the individual athlete: there is a need to change this situation by learning lessons from oral rehydration therapy. Professor Ron Maughan and Dr Susan Shirreffs are working to develop biomarkers that can be used to assess needs of individual athletes.

PHYSIOLOGY

Athletes must explore strategies appropriate to their individual sports. New findings from Professor Ron Maughan and Dr Phil Watson, together with overseas collaborators, include the identification of some aspects of brain function that can be influenced to alter exercise performance: the use of drugs—some of which are not prohibited for use in sport—can enhance performance in some exercise tasks. These findings also suggest some genetic differences between those who exercise and those who do not: whether this is related to performance is not at present clear. This raises ethical challenges that must be resolved.

Key to the success of HETS in sport is education of athletes, coaches and those who support them. Dissemination of available information has lagged far behind scientific progress: the use of new technologies to improve communication with athletes must be an essential part of any strategy.

May 2006

Memorandum from Dr Henning Wackerhage and Dr Aivaras Ratkevicius, School of Medical Sciences, College of Life Sciences & Medicine, University of Aberdeen

ANTI-MYOSTATIN DRUGS: THE NEW ANABOLIC STEROIDS?

1. *Myostatin function*

Myostatin is a key regulator of muscle mass: it is a peptide that potently inhibits muscle growth. Experimental myostatin knockout in mice or some natural mutations of the myostatin gene increase muscle mass dramatically in mice, cattle and human beings. The case of a boy with twice the normal muscle mass due to a “natural” myostatin mutation was reported widely.

2. *Anti-myostatin drugs*

Muscle wasting is a problem in a wide variety of conditions that include normal ageing, HIV/AIDS and some forms of cancer. Anti-myostatin therapy seems suitable for many of these conditions. Myostatin is an “easy” drug target because it can be targeted extracellularly, acts tissue specific and because endogenous inhibitors can be mimicked. It is also a commercially attractive drug target because it is suitable for the prevention of muscle wasting in the whole elderly population. This could be a crucial intervention leading to greater independence in ageing Western societies.

3. *Current drug development*

Wyeth are currently testing the effectiveness of a monoclonal anti-myostatin antibody (MYO-029) on patients with facioscapulohumeral muscular dystrophy (FSHD), Becker muscular dystrophy (BMD) and limb-girdle muscular dystrophy (LGMD). Results are expected for late 2006. Thus it seems likely that anti-myostatin drugs will become available well before the 2012 London Olympics. Bogus anti-myostatin treatments (Myozap) are commercially available showing the desire of bodybuilders and others to achieve muscle growth by inhibiting myostatin.

4. *Likelihood of abuse and dangers*

Many doping scandals are linked to bodybuilders or strength/power athletes taking agents that aim to increase muscle mass. Thus muscle growth-promoting myostatin inhibitors are likely to be (ab-) used once they become available. At the same time myostatin inhibitors are probably safer than anabolic steroids because myostatin action is muscle specific whereas anabolic steroid affect many organs other than muscle. Anti-myostatin drugs are likely to be the new anabolic steroids.

5. *Challenges for drug testers*

Monoclonal antibodies (ie the anti-myostatin treatment currently tested) is a new kind of doping agent. It should be easy to detect these antibodies in blood because they are raised in another species. However we are unsure whether such antibodies or their degradation products can be detected in urine. It is, however, likely that future myostatin treatments will not be limited to monoclonal antibodies. There is a series of papers reporting the existence of endogenously produced myostatin-inhibiting peptides. These are nature's models for anti-myostatin therapy and it seems likely that pharmaceutical companies or others will attempt to copy these. Myostatin-inhibiting compounds might be detected by screening libraries of chemical compounds.

6. *Executive summary*

Myostatin inhibitors are likely to become available well before the 2012 Olympic Games in London. There is little doubt that they will be abused by bodybuilders and other strength/power athletes. Myostatin inhibitors are likely to be safer than anabolic steroids, growth hormone and clenbuterol which are drugs currently used to attempt to increase muscle mass. If monoclonal anti-myostatin antibodies are used to inhibit myostatin then the detection in blood should be easy but it is unclear whether the detection in urine is feasible. Research is needed to develop urine-based detection methods.

ADDITIONAL INFORMATION

The potential for different HETs, including drugs, genetic modification and technological devices, to be used legally or otherwise for enhancing sporting performance, now and in the future

I wish to comment on the likelihood that new HETs will be developed and used in sport. Currently molecular biologists and sports and exercise scientists discover at new mechanisms and genetic variations that regulate factors such as muscle growth, capillarity, oxygen transport capacity, energy metabolism and heart growth. Mechanistic knowledge allows us to understand how physical training induces adaptations. It is also crucial knowledge for developing treatments (or HETs) that target these mechanisms for therapeutic aims. For example, the discovery of erythropoietin (EPO) laid the foundation for the synthesis of this hormone. Synthetic EPO can be used to increase red blood cell production in patients with low red blood cell count and in endurance athletes where it increases oxygen transport capacity. The discovery of the muscle growth inhibitor myostatin triggered the development of monoclonal antibodies against myostatin. These can potentially be used to increase muscle mass in > 75 year olds or in strength athletes. Novel HETs are likely to be developed especially for mechanisms that can be targeted extracellularly (both EPO and myostatin can be targeted extracellularly). In my opinion serious genetic manipulation of athletes is unlikely to be attempted before 2012 because it is technically difficult and the type of desired and side effects are unclear. To conclude it seems likely that novel HETs will be developed and used by athletes before the London 2012 Olympics.

Steps that could be taken to minimise the use of illegal HETs at the 2012 Olympics

I don't have any new ideas to contribute.

The case, both scientific and ethical, for allowing the use of different HETs in sport and the role of the public, Government and Parliament in influencing the regulatory framework for the use of HETs in sport

Without being a legal expert I feel that there is a case for a strong legal deterrent against using the most dangerous doping agents such as EPO. Seven elite cyclists died of sudden cardiac death between 2003 and 2004 alone (*The Observer*, Sunday 7 March 2004) and it seems very likely if not obvious that most if not all of these deaths are related to the use of EPO or related agents. Thus, government may wish to consider strengthening the law to try to prevent the use of such agents by athletes.

For all other agents I feel that the anti-doping policies by most sporting associations are adequate. The government and parliament should consider lobbying for removing sports from the Olympic programme that do not sufficiently control doping.

The state of the UK research and skills base underpinning the development of new HETs, and technologies to facilitate their detection

Sports and exercise research is probably less well funded in the UK than in the US or Scandinavia. There are several researchers [Goldspink, Harridge, Montgomery (London), Wagenmakers (Birmingham), Rennie, Greenhaff (Derby/Nottingham), Harris (Chichester), Maughan (Loughborough) and Baar, Sakamoto, Hardie (Dundee)] that make important contributions to the discovery of exercise mechanisms and genetic variations that are related to performance, therapies and HET development. Additional financial support for such research is desirable.

It is unfortunate that the practical skills (ie biochemical, molecular biology and genetic techniques) necessary for mechanistic exercise research are not often taught as part of sports and exercise science degrees. At Aberdeen we have thus decided to develop a MSc in Molecular Exercise Physiology where hands on training in such techniques is a key component. It is desirable that such skills are also developed as part of other sports and exercise science programmes.

The great challenge for HET detection is the detection of HETs or their degradation products in urine unless blood samples are taken. Some new classes of HETs (for example antibodies) require novel approaches for their detection in urine which may be difficult.

May 2006

Memorandum from the European Specialist Sports Nutrition Alliance

1. INTRODUCTION

1.1 The European Specialist Sports Nutrition Alliance (ESSNA) represents the interests of the manufacturers and distributors of specialist sports nutrition products in Europe. Its members include most of the major brands in the sector. Member companies are committed to adopting high standards in manufacturing processes and delivering high quality products. ESSNA members also commit to compliance with all relevant regulations. ESSNA is in regular dialogue with the European Commission and with Member State Competent Authorities, including the UK Food Standards Agency. Contact details are in Annex 1 (not printed); membership is listed in Annex 2, and the biography of our Chair, Dr Adam Carey, is given in Annex 3.

1.2 We welcome the inquiry by the Committee into human enhancement technologies and are grateful for the opportunity to submit written evidence.

1.3 This short introductory memorandum can be no more than a very brief overview of a number of key areas, but we hope that it is helpful as an indication of our willingness to provide further information or more detailed comment should the Committee wish to explore further any particular issue.

2. CREDIBLE PRODUCTS

2.1 Good basic nutrition is an absolute essential for athletes, yet all too often lifestyles and sometimes training regimes make it difficult to achieve this goal. Sports nutrition products and other specialist food products can provide a convenient form of nutrient intake. More specialist products can help build on good basic nutrition to enable athletes to achieve their maximum potential.

2.2 Sports nutrition products include basic food supplements (vitamins and minerals), specially formulated snack bars, re-hydration drinks, sources of concentrated energy, and more specialist products to help with recovery and muscle development after intense physical exercise.

2.3 The majority of consumers of specialist sports nutrition products today are not elite athletes, but “ordinary” consumers or recreational sportspersons who take part in often low-level sporting events, personal exercise, or gym-based fitness regimes. Our members’ products today are widely available on general retail sale, many in high-street outlets, as well as through mail order, the internet and centres of sporting activity such as sports centres and gymnasias.

2.4 In the United Kingdom, food law requires products to be safe and appropriately labelled, and also to comply where appropriate with the compositional and other requirements of the European Union legislation which regulates food supplements (Directive 2002/46/EC) and food for “particular nutritional purposes” (Council Directive 89/398/EEC). The legislation is rigorously enforced through the work of the Food Standards Agency, the Medicines and Healthcare Products Regulatory Agency, Trading Standards Officers, and a responsible industry approach to maintaining high manufacturing standards.

2.5 Many international competitors now take the issue of basic nutrition and enhanced nutrition very seriously because it can make a significant difference to performance as demonstrated in numerous published studies and anecdotal reports.

2.6 The products of our members are based upon sound science. In many cases that science is well-established and widely accepted. Should the Committee find it helpful, we would be pleased to submit scientific evidence to demonstrate this.

2.7 It is, however, in the nature of the sports nutrition sector that emerging science can contribute to product innovation and development. Sometimes, the effect of nutritional products on performance is difficult to “quantify” in the traditional sense since the number of elite athletes involved in any study would inevitably be small; other differences, for example, in training and diet, may be potentially substantial and the difference between first and second place in elite international competition is sometimes so small as to be almost immeasurable (eg hundredths of a second), and certainly below the tolerances of error in a traditional scientific study.

2.8 We hope that your committee might recommend that those responsible for high-level, elite and international sport in the United Kingdom ensure that sportsmen and women have access throughout their careers to sound nutritional advice from experts in the field of specialist sports nutrition who can guide them not only on basic nutrition, but also on how best to maximise their potential through optimal nutritional intake.

2.9 Such a strategy could contribute significantly to improved performance by British competitors at international level.

3. USE OF ILLEGAL SUBSTANCES BY ELITE ATHLETES

3.1 It is acknowledged and regretted by ESSNA members that some elite athletes seek to achieve competitive advantage by breaking the rules of their own sports and by using illegal substances. This is deplorable and is an issue rightly taken seriously by sports governing bodies and by the British Government, particularly in the run up to the 2012 Olympic Games in London.

3.2 It is important to appreciate, however, that the term “illegal” has two different meanings in this context. For example, a substance may be “illegal” for sale for human consumption under food or medicines legislation. In such cases criminal prosecutions can, and should, be considered for those marketing or possessing such products. In relation to elite sport, however, the term “illegal” is sometimes used to describe products that contain substances which are perfectly legal for general sale to ordinary consumers (for example over the counter medicines, herbal remedies etc) but which are specifically banned by the governing bodies of sport for elite competitive athletes. Confusion over the use of these different meanings of the term “illegal” should be avoided.

3.3 ESSNA welcomes moves by the UK Government, WADA and UNESCO to highlight the issue of doping in sport and to seek ways of addressing this problem. We remain committed to playing a part in this process and would hope that those stakeholders taking the lead in developing kite-marking and voluntary codes will ensure our members are fully consulted and that their views are taken on board.

3.4 We hope that your Committee will recommend that the specialist sports nutrition sector represented by ESSNA is indeed fully involved by those agencies in developing their approach.

4. CURRENT DIFFICULTIES

4.1 ESSNA notes that it has been alleged that there are unscrupulous manufacturers who place on the market products that contain prohibited and sometimes dangerous ingredients and that there are also manufacturers who market products to elite athletes but who mislabel their products. We have seen no substantive evidence to support the assertion that such practices are common and can see no commercial benefit to a company from adopting such behaviour. Indeed, there would be absolutely no commercial advantage to be gained by our members deliberately contaminating, mislabelling or otherwise allowing products to go to market without full compliance with regulation. Damage to our members’ brands would be considerable were they to do so.

4.2 We deeply regret the unjustified manner in which the responsible specialist sports nutrition sector is unfairly blamed for deliberate substance abuse by individual athletes or as a result of those tests for banned substances which are in fact “false positives” (see below).

4.3 Furthermore, the scale of positive testing for banned substances has been grossly exaggerated because of both media sensationalism and flawed interpretation of the results of the Geyer study⁸.

4.4 If there were indeed widespread contamination then many more athletes would be caught by positive tests. This is simply not happening. Tests by WADA, the IOC and other governing bodies suggest that only a very small fraction of athletes in fact test positive.

4.5 Our members, therefore, clearly share with regulators and the sporting community a powerful incentive to see that the issue of substance abuse in sport is addressed.

⁸ Geyer H et al Anabolic Steroids in Nutritional Supplements Int J Sport Med 2004; 25:124–129.

4.6 We are committed to promoting best manufacturing practice and accept that manufacturers must take full responsibility for the quality, composition and correct labelling of their products. However, individual elite athletes must also take responsibility for the substances they consume, taking professional advice before using specialist products, and they should cease blaming industry as an easy scapegoat to hide their own transgressions.

4.7 We hope that your Committee might promote acceptance of the different but equally important responsibilities of athletes and of industry.

5. FALSE POSITIVES

5.1 There is one specific area to which we also feel that elite sport might pay close attention in the future. That is the area of “false positives” which can arise in cases of alleged doping or substance abuse. By this we mean that there are certain situations in which a test might indicate that an athlete has consumed a banned substance when in fact this may not be the case. False positives may arise for a variety of different reasons.

5.2 For example, 22% of women have or may have polycystic ovarian syndrome—this could cause naturally high levels of nandrolone which would cause a positive test. Individuals with naturally elevated nandrolone levels are more likely to be elite athletes because they may be stronger and able to build muscle faster.

5.3 Nandrolone is an androgenic anabolic steroid, produced naturally by the body and ingestion or injection is considered a doping offence by WADA. Intense training can increase endogenous nandrolone production in the absence of oral consumption, with the possibility of a false positive (Kohler et al 2002⁹). Sports supplements are often used to help athletes increase training intensity and volume. This could lead to an athlete testing positive, even though nandrolone (and/or its precursors) have not been consumed (Kohler et al. 2002). It is also possible that consumption of some mineral supplements such as zinc could optimise the body’s natural production of nandrolone also resulting in a false positive (Kohler et al. 2002). In these examples it could be argued that the use of sports supplements resulted in positive test, even though the products were devoid of nandrolone or its precursors or any other banned compounds. This presents a difficult situation for the athlete who tests positive, the companies who supply supplements that are free of steroid contaminants and WADA.

5.4 Athletes can also test positive through inadvertent consumption of foods or supplements containing banned substances. Under well-controlled laboratory conditions consumption of boar meat produces a positive for nandrolone, as meat naturally contains nandrolone and its precursors (Le Bizec et al. 2000¹⁰). The consumption of poppy seed bagels (which naturally contain opiates) could also result in an athlete testing positive for morphine (Rohrig and Moore 2003¹¹). Under strict liability the athlete is responsible for anything that is present in his body and would face a ban even though the positive test arose from consumption of common food products.

5.5 It is clear that WADA testing laboratories need to work with athletes, supplement companies and food manufacturers to gain a clearer understanding of the physiological and biochemical conditions that increase nandrolone excretion. Without this understanding athletes will be falsely accused of doping and supplement manufacturers will be falsely accused of supplying contaminated products.

5.6 So, false positives may again suggest that the problem of doping is in fact greater than is actually the case. Certainly, if such false positives do arise, they do a grave injustice to the individual athletes involved whose careers may be destroyed, as well as being damaging to the reputation of sport and of sports nutrition manufacturers.

5.7 We hope that your Committee might consider recommending further research into the area of “false positives”.

6. WHAT CAN COMPANIES DO?

6.1 Whilst we would stress the point that the problem of doping in elite sport must not be overblown, it is clear that there are issues, and any case of doping is a case too many.

6.2 Cross-contamination and accidental contamination are sometimes cited as reasons why banned substances may be present in sports supplement products. ESSNA believes however that this is not the case today if it ever was. Indeed, it is possible for manufacturers to reduce the risk of cross-contamination to an almost incidental level by establishing rigorous control mechanisms into the supply chain and ensuring that reputable suppliers are used at all times.

⁹ Kohler et al (2002) Urine nandrolone metabolites: false positive doping test? *Br J Sports Med.* 36; 325–329.

¹⁰ Le Bizec et al (2000) Consequence of boar edible tissue consumption on urinary profiles of nandrolone metabolites. *I Mass spectrophotometric detection and quantification of 19-norandrosterone and 19-noretiocholanolone in human urine.* *Rapid Commun Mass Spectrom.* 14; 1058–1065.

¹¹ Rohrig and Moore (2003) The determination of morphine in urine and oral fluid following ingestion of poppy seeds. *J Anal Toxicol.* 27; 449–452.

6.3 The Committee may wish to consider recommending that further studies be conducted in this area to ascertain whether such contamination does in fact really occur.

6.4 With regard to contamination more broadly, companies that produce under FDA/HFMA Good Manufacturing Practice backed up by ISO 9001/2 are at much reduced risk of contamination. Accidental contamination is more likely to occur if companies do not follow these strict guidelines or production lines are not isolated or cleaned properly in-between batches. It is never possible to eliminate all risk but these and other similar steps can reduce it substantially.

6.5 For those manufacturers who wish to market specifically to elite athletes there is always the option of introducing pharmaceutical standard batch testing, though this is not generally considered appropriate for food products aimed at the general market.

6.6 ESSNA accepts that sports nutrition companies should adhere to codes of manufacturing practice. Our members are already working with individual Member States regulatory bodies, trade associations, and national governing bodies of sport as they develop their own guidance in this area. Such dialogue between industry, sporting bodies and regulators is vital in terms of identifying and examining practical solutions to this problem.

6.7 Annex 4 to this paper includes examples of good manufacturing and testing practice used by some of our members.

6.8 We hope that your Committee might feel able to commend the responsible steps that our members have taken.

7. DIALOGUE WITH REGULATORS

7.1 There is a tendency on the part of regulators to deal only with the larger trade bodies representing less specialist food product categories and which are not truly representative of the specialist sector.

7.2 Whilst such trade associations clearly should be considered as stakeholders, the sports nutrition industry cannot be represented only by such large generalist trade associations (which tend to be dominated by soft drinks manufacturers). This is one of the reasons why ESSNA was set up, and in terms of communicating with the specialist market, engaging ESSNA from the outset must be seen as a priority. The solution to this problem lies in reaching out to the small and medium sized enterprises that may not have the resources to batch test all products and to apply the most stringent monitoring regimes. ESSNA acts as an important conduit to this group.

7.3 Regulation has a key role to play. It can punish transgression and cajole businesses. However, the leadership which ESSNA and its member companies are showing can change cultures, bring about paradigm shifts, and develop a real commitment to improvements in practices throughout the specialist sector. Indeed, the specialist sector is uniquely positioned to help lead the development of solutions to doping issues. In this regard, we look forward to assessing the proposals that result from the current IADSA/IDSI project initiated at the 2005 Leipzig Conference.

7.4 Industry has already done much by way of self-regulation, with examples highlighted in the short case studies appended to this statement. However, ESSNA does recognise that more can be done and we very much look forward to working with government, regulators and sports bodies who are taking this process forward.

7.5 We hope that your Committee might feel able to acknowledge the role that ESSNA can play and encourage others fully to involve our members in their work to address problems of doping and/or contamination.

8. FUTURE LEGISLATION

8.1 The European Commission is committed in principle to bring forward more detailed legislation to regulate still further sports nutrition products, and it produced (20 April 2004) a Working Document of a Draft Commission Directive on Foods Intended to Meet the Expenditure of Intense Muscular Effort, Especially for Sports People (SANCO D4/HL/mm/D440182).

8.2 ESSNA is not opposed in principle to additional proportionate legislation to create a harmonised market in sports nutrition products. However, we have registered with the European Commission a number of fundamental concerns about the proposed direction of this measure.

8.3 The proposed legislation is based upon a review of specific areas of the science of sports nutrition which was included in a report by the Scientific Committee for Foods (SCF) in 2000. That report was some time in preparation, therefore the work that led to its publication was inevitably the review of scientific papers published sometime earlier and therefore relying on studies that are now several years old. The Committee may wish to consult with the scientists involved in preparing that SCF report to see if they themselves would consider it appropriate to revisit the project prior to the Commission bringing forward legislation.

8.4 Furthermore, the sports nutrition market has developed substantially in recent years and some of the product categories that now exist, and for which there is strong evidence of safety and efficacy, were simply not envisaged at the time this work was undertaken.

8.5 We would be keen to provide more detailed comment on the proposed legislation if this would be helpful. However, since the proposal is based upon an out-dated understanding of the market and upon science published now many years ago, not only is its detail in need of review, but also its scope and fundamental principles.

8.6 We strongly believe that before the European Commission makes the mistake of bringing forward proposals based upon old science and an out-dated understanding of the marketplace, that would seriously and substantially impact upon small and medium sized enterprises as well as restricting consumer choice, it should be invited to consider:

- (a) undertaking an inventory through the Scientific Cooperation Procedure (SCOOP) of the products currently on the market; and
- (b) asking the European Food Safety Authority (EFSA) to review through its standard procedures the safety of the products identified.

8.7 Having taken such steps, the European Commission, in order to avoid the sort of problems and controversy associated, for example, with the Food Supplements Directive, should:

- (c) ensure that any new legislation strikes the right balance between consumer safety and maintaining consumer access to safe, popular and effective products;
- (d) provide flexibility within the legislation for future product development and innovation in such a way that does not require ongoing amendments to the primary legislation; and
- (e) demonstrate an understanding of the differences between the needs of ordinary consumers and elite athletes, the latter of whom should look to their Governing bodies for detailed regulation.

8.8 We do hope that your Committee might feel able to endorse these points if inappropriate legislation is to be avoided.

9. CONCLUSION

9.1 We hope that these introductory observations are helpful to you in your work and that you will not hesitate to invite us to provide further information on any of the points covered whether through further written submission or oral evidence.

Annex 2

ESSNA MEMBERSHIP:

Full members

EAS International
 Garnell Corporation
 MET RX (Europe)
 Maximuscle
 Twinlab Corporation
 Weider Global Nutrition
 CNP (UK) Ltd
 Reflex Nutrition
 LA Muscle
 Tropicana Health and Fitness
 Carbery

Associate Members

Weider Publishing (Europe)
 Health Food Manufacturers Association (HFMA)
 European Health Food Manufacturers Association (EHPM)

Annex 3

BIOGRAPHY OF DR ADAM CAREY BSc MB, BChir, MA, MRCOG

After qualifying from medical school at Oxford, Adam went on to complete an MRC training Fellowship and become a member of the Royal College of Obstetricians and Gynaecologists. During his training he developed a sub-specialist interest in reproductive endocrinology and nutrition. He left the NHS eight years

ago and for seven years was head of nutrition for the Rugby Football Union. He now manages a similar role for England Cricket and supports a number of other Olympic sports as well as having an active involvement in football. Adam has been the Chairman of ESSNA since December 2003.

Annex 4

THE MAXIMUSCLE QUALITY CONTROL AND DRUG SCREEN POLICY

Maximuscle is Britain's largest sports nutrition brand and sell a complete range of products for serious and dedicated gym users, athletes and sports participants. Our reputation and unique range means we supply many of the biggest names in British sport across; rugby, football, cycling, bodybuilding and many more. . .

With this comes an important responsibility, which is to ensure all our products are manufactured to the highest standards, whilst complying with the most stringent quality control checks. The list below provides you with a detailed summary of the processes we use to ensure our products meet the highest quality and safety:

1. Maximuscle tests the raw ingredients it uses in all of our products. We demand purity, authenticity and origin certificates. Where we are not 100% assured of the quality of these certificates, Maximuscle will perform independent tests on raw ingredients to confirm the above.
2. Maximuscle regularly visits and audits its manufacturing plants, to ensure compliance with either; HACCP, ISO9001, 9002 or GMP, whichever is most suitable for the type of products we are producing.
3. All finished batches are independently tested at Trading Standards approved labs, to ensure that the macro nutrients quantities (fat, carbs, protein, etc) are correct and what is on the label is in the bottle.
4. Every batch undergoes microbiological tests to ensure that there is no danger of heavy metal contamination or bacteria growth. All new batches of bars or perishable goods are shelf life tested before being released to the market place.
5. Maximuscle is the only company in the World to have each and every batch of products— independently drug screened at HFL, (an approved WADA lab). This unique test, which Maximuscle uses, complies with ISO17025 (the same standard as used by the IOC) as well as being UKAS approved. This unique ISO17025 approved drug test screens each and every batch, to show that problematic stimulants and steroids are not present above an agreed de minimis level.
6. Maximuscle hold all Certificates of Analysis for all lot numbers.

*The key to the success of Maximuscle's comprehensive drug screening is that we test each and every batch of all of our products, to ensure peace of mind for our customers. Unlike other brands we do not do random testing or use the IOC urine test. Although these are cheaper alternatives, they are not considered fool proof for the risks found within the supplement industry. The HFL tests have been developed specifically for sports nutrition products and are unique. Most importantly they are UKAS and ISO17025 approved, which is vital to ensure these tests are trusted by athletes.

MET-Rx

Product Quality Assurance

MET-Rx is committed to providing high quality nutritional supplements. Our products do not contain any banned substances. We do not use any ingredient which contravenes the current anti doping recommendations of WADA or UK Sport in any of our formulas, nor do we have any of these substances on the manufacturing premises.

MET-Rx follows strict Good Manufacturing Practices. Our Quality Control, Quality Assurance and HACCP programs are internally and independently audited to ensure top quality products and that our performance measures are continually met.

Our Quality Assurance professionals supervise manufacturing and packaging processes to ensure product integrity, purity and accuracy of contents. In-process Quality Control checks are performed at every stage of the manufacturing and packaging process to ensure that the end product is of the highest quality.

All raw material suppliers are required to conform to our stringent product specification protocols and each batch of material is subjected to an extensive Quality Assurance programme:

- We endeavour to conform to the United States Pharmacopoeia and National Formulary requirements, which are the industry standard for potency, quality, purity, and strength.
- All raw materials are tested for identity.

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- All of our raw materials and finished goods are tested by our in-house chemistry laboratory for potency and purity and by our microbiological lab for purity.
 - Our Quality Control laboratory employs degreed and qualified chemists who test our products to ensure that they meet our stringent specifications for consistency and quality of product.
 - Quality testing is performed using USP/NF procedures, where they exist.
 - If a USP/NF procedure does not exist for a product, other published referenced works are consulted, such as the European Pharmacopoeia, etc.
 - If a published method does not exist, we have method development chemists on staff that develops procedures which are then proprietary to MET-Rx.
 - Our products are subjected to rigorous laboratory testing before, during and after manufacture, including analysis by HPLC, GC, FTIR, TLC, UV/ Spectrophotometry, wet analysis and Near Infrared Spectrophotometry.

EAS INTERNATIONAL

EAS is the world's leading provider of active lifestyle nutrition products and is dedicated to producing products that have been sufficiently backed by scientific research both in their effectiveness and safety. EAS provides products that cater for a variety of people from regular gym users to elite athletes.

EAS have strong ethical practices which have resulted in an excellent reputation throughout the globe in more than 46 countries. Many athletes, throughout the world, use EAS products with confidence that they are effective, safe and free from any banned substances.

Scientific Research

EAS is committed to providing the marketplace with scientifically based dietary supplements. EAS support this by fostering a strong relationship with their science board, a group of ABBOTT and ROSS scientists and health professionals from around the world.

Food Safety

EAS International products are only manufactured in facilities with the following certified manufacturing processes:

- EN ISO 9001:2000.
- HACCP (Hazard analysis Critical Control Points).
- GMP (Good Manufacturing Practice).
- IFS (International Food Standard).

Doping Free

EAS International products which are considered to be for professional use, are additionally production lot tested for non IOC compliant substances and are considered to be "doping-free".

Even though EAS has never come under question regarding their products containing banned substances, ensuring the purity and quality of products has demanded increased vigilance over suppliers, ingredients, equipment and production processes. EAS has even gone so far as to have their own products tested for banned substances before they are marketed and sold.

EAS works with the most experienced sports testing lab in the EU. The laboratory is accredited for forensic testing for the World Anti-Doping Agency (WADA), who supports the efforts of the IAAF and FINA in effort to reduce doping in sports in general and regardless of sport. This laboratory and testing service used by EAS is currently the only one of its kind in the UK to be accredited by the United Kingdom Accreditation Service (UKAS) under ISO 17025, which is an internationally recognised quality standard for analytical testing.

Sealed batch samples of all tested products are retained for the duration of the product shelf life. In the event that an athlete who has been taking an EAS guaranteed doping-free product returns a positive conducted in accordance with the World Anti-Doping Code, these sealed batch samples will be made available for independent testing to prove that the positive test was not due to that EAS product.

To help provide that extra confirmation to athletes, EAS can provide them with Certificates of Analysis for all batches of tested products. In addition, to make things quick and easy, athletes can cross reference their product lot numbers with our online service at www.doping-free.com.

May 2006

**Memorandum from Professor Julian Savulescu, Director, Oxford Uehiro Centre for Practical Ethics,
University of Oxford and Bennett Foddy, Centre for Applied Philosophy and Public Ethics,
University of Melbourne, Australia**

WHY WE SHOULD ALLOW PERFORMANCE ENHANCEMENT IN SPORT

Executive Summary

In this submission, we will argue that performance enhancement occurs, it is not against the spirit of sport, and that we should remove anti-doping legislation to permit safe performance enhancement. We should focus more on testing athletes' health and fitness to compete.

1. What is wrong with doping? The key idea is that it is against the spirit of sport. It is cheating, not merely because against the rules but because against the spirit of sport. The The World Anti Doping Agency's Code says explicitly that all "[d]oping is fundamentally contrary to the spirit of sport".

2. What is sport? Sport is defined variously as:

- "recreational or competitive activities that involve a degree of physical strength or skill";
- "sports are an invention" by homo sapiens of play or hunting;
- "physical contests performed for their own sake and not for some ulterior end"; and
- "since sports are an invention, a part of culture rather than an aspect of nature, all definitions of sports are somewhat arbitrary." (Encyclopaedia Britannica).

3. For our purposes, sport can be defined as the pursuit of human physical excellence (skill or strength) in a rule governed activity.

4. The rules of sport are: (1) arbitrary; (2) define the nature of the activity to bring out the display of certain skills or strengths; (3) allow for meaningful comparison in competitive sport to determine who is better.

5. Human excellence has typically been biological endowment plus training to realise own innate biological potential.

6. There are many different good reasons to choose or amend the rules of a sport:

- To bring out or develop a particular set of skills, strengths or physical excellences.
- To facilitate meaningful competition.
- To promote or protect health.
- To provide spectator interest.
- To increase its lucrativeness.
- According to some cultural or historical precedent.
- To allow historical comparison.

7. Performance enhancement using drugs or other doping agents is against the spirit of sport if sport is the of natural ability/talent in a rule governed activity.

8. There is no reason sport must remain purely a test of natural ability.

9. WADA's Code allows some performance enhancing drugs. Caffeine is not illegal, even though it can strongly increase performance. In endurance sports, caffeine helps to mobilize the fat stores of an athlete.¹² It can make as much as a 20% difference in the time to exhaustion among competitive athletes, depending on how the trial is performed. In the context of elite sport, that is a massive difference. Dietary supplements such as creatine are also legal on this 2-out-of-3 rule, and they also strongly influence performance. Creatine is similar to the banned drug EPO—in that it supplements an endogenous substance. Two different double-blind studies found that the time to exhaustion in anaerobic exercise could be increased by over 10% through the use of creatine.^{13, 14} The reason that these performance enhancers are permitted is because they are safe. It is inconsistent not to allow other performance enhancers if they are safe enough.

10. Some high tech training techniques produce exactly the same effect as doping. Altitude training and hypoxic air tents both raise haematocrit by stimulating the body to produce erythropoietin (EPO). This has the same effect as blood doping (autotransfusion) or administering EPO. The former are permitted, while the latter are not. This is inconsistent.

11. Classical musicians are allowed to use drugs such as beta blockers to remove tremor and increase performance. This does not corrupt the spirit of their performance. Rather, it is seen as facilitating better and more desirable performance.

¹² Costill, D, Dalsky, G, Fink, W. Effects of caffeine ingestion on metabolism and exercise performance. *Med Sci Sports Exer* 10:155–158, 1978.

¹³ Bosco C and others. Effect of oral creatine supplementation on jumping and running performance. *International Journal of Sports Medicine* 18:369–372, 1997.

¹⁴ Prevost M C, Nelson A G, Morris G S. Creatine supplementation enhances intermittent work performance. *Research Quarterly for Exercise and Sport* 68:233–240, 1997.

12. Humans are different to other animals and human sport is different to other sports involving animals. Humans are autonomous, capable of making evaluative judgements and capable of deciding what kind of sportsperson to be. The human spirit is to choose to be better and to modify oneself to improve one's performance. It is consistent with the human spirit to allow sportspeople to make choices about performance enhancing modifications, if these are safe enough. While animal sport may be a brute test of genetic potential, human sport could be a test of the whole person, including their capacity to make their own rational decisions about what kind of competitor to be.

13. Sports evolve over time. We have allowed changes to sport over the years. In tennis, large head tennis racquets changed the game. This allowed players to hit the ball harder from a wider range of places on the court. Ultimately, this, together with other changes to game, reduced the spectacle as male players were hitting, particularly serving, the ball so hard that there were no rallies. Subsequently, the pressure of the balls was reduced. The increase in the size of the racquet head was allowed because it was thought to be in the spirit of tennis at the time. However, double strung tennis racquets were never permitted. They would have allowed too much spin and would have radically changed the game.

14. In general, as human beings, we are biased in favour of small, gradual change and against large or dislocated changes. We are likely to accept small, gradual enhancements rather than radical and profound ones. There may be no moral reason for this but it seems important to people to keep some thread of continuity in the nature of a particular support. However, such a thread can be maintained while allowing small to modest enhancements.

15. Performance enhancement is not necessarily against the spirit of sport.

16. There are four positive reasons to allow safe performance enhancers in sport. Firstly, current prohibitionist policy has failed. Only around 10–15% of athletes are tested. There are enormous pressures to win. Many modern doping agents like EPO and growth hormone mimic natural hormones and are extremely difficult to detect. As gene doping becomes more efficient, it is likely to offer great opportunities for doping in sport and is likely to be very difficult to detect. For example, Insulin-like growth factor injected into the muscles of mice increases strength. Direct injection into the muscles of athletes would be simple and very difficult to detect as DNA would be taken into muscle DNA, requiring muscle biopsy (which is dangerous and difficult) to detect it. Vascular endothelial growth factor stimulates the development of new blood vessels and could also be of use to athletes in the future. EPO genes could be directly integrated into host DNA. Since gene therapy works in animals now, there is no reason why it could not be attempted by athletes now.

17. The second reason is that it would be fairer. The present system of doping controls disadvantages the honest athletes who forego doping. Cheaters are rewarded. Cheating is against the spirit of competitive sport. If performance enhancers were allowed, cheating would be eliminated. Athletes do not cheat when they take legal performance enhancers like caffeine or creatine.

18. The third reason is that it would reduce risk to athletes. The present system creates an environment of risk to the athlete. Since nearly all doping is illegal, the pressure is to develop undetectable performance enhancers with no mind to safety. Performance enhancers are produced on the black market and administered in a clandestine, uncontrolled way with no monitoring of the athlete's health. Allowing the use of safe performance enhancers would make sport safer as there would be less pressure on athletes to take unsafe enhancers and there would be a pressure to develop new safe performance enhancers.

19. Allowing safe performance enhancers would not eliminate risk to athletes' health but it would reduce it. Some would still cheat, and seek an advantage through the use of unsafe, illegal enhancers. But it would narrow the gap between the cheaters and the honest athletes. By allowing some (safe) performance enhancement, honest athletes get closer to the level of the cheaters. If this were coupled with greater focus on evaluating fitness to compete and health, as suggested below, rather than drug detection, there would be an even greater improvement in athlete health.

20. Allowing safe performance enhancement would reduce what has been called "soft coercion" in sport. Coercion occurs when a person is compelled to accept an option that makes him or her worse off than she would otherwise have been, if the option had not been presented. "Your money or your life" is an example of coercion because the person typically prefers to have both her money and her life, but she is forced to accept something which is worse than what she had and could have. Safe performance enhancement is not a coercive offer: being able to perform better without unreasonable risk to health is a benefit not a burden. Unsafe performance enhancement can be a coercive offer, but this is precisely what is encouraged by preventing all doping as we currently do. If we are concerned to reduce coercion, we should allow safe performance enhancement. Offering safe performance enhancement is no more coercive than offering prize money.

21. A "Real World Anti-Doping Code" would allow safe performance enhancing interventions. It would have three major planks.

22. Firstly, we should develop safer performance enhancing drugs or interventions. These need to be as effective as riskier options. Ideally, they need to be no more effective when taken in harmful megadose quantities. They need to be provided at a competitive price.

23. Secondly, we should focus detective efforts on unreasonably risky drugs and practices.

24. Thirdly, we should test health of athletes and fitness to compete. It is far easier to test haematocrit (the amount of red blood cells in the blood), and set a safe level (such as 50%) and ban anyone who is above that level and at risk, than it is to detect the cause of that elevation, which could be natural, autotransfusion, use of hypoxic air tent, gene doping or exogenous EPO. We should test heart structure and function, which has been recommended even with high levels of training. We could also test immunocompetence and testosterone levels and joint structure and function. In Melbourne, boxers are excluded from competition if they have measurable brain damage on magnetic resonance imaging.

25. The question is: what risks should athletes be exposed to? It is not: what is the origin of that risk? Setting the acceptable risk level for performance enhancing drugs should be consistent with the magnitude of risk which athletes are allowed to entertain in elite sport.

26. Elite sport can be extremely harmful. Even clean elite athletes have to accept serious harms to be competitive. These risks are usually reduced or absent in amateur competition, so just like drug risks, they are risks which are extrinsic to a sport—they are not a necessary part of the sport. There is nothing special about a drug-related risk which demands that we intervene, when we permit these unnecessary non-drug risks to exist.

27. One group has written that there is a limit to human cardiac adaptation to sports training, placing some athletes at risk of sudden cardiac death.¹⁵ This risk is elevated if exotic training schemes are undertaken to increase hematocrit, such as altitude training or hypoxic tent training.

28. Athletes who are stressed or overtrained also suffer a depletion in their immune systems.^{16,17} Normal amounts of exercise increase the effectiveness of a person's immune system. But when we begin to overtrain, the effect is reversed. In elite sports, athletes are at heightened risk of infection.

29. One Norwegian study found 15% of gymnasts were anorexic.¹⁸ Christy Henrich is one example: she was an American gymnast who died of multiple organ failure when she was 22 from anorexia.

30. Gymnastics is not the only sport with unbreakable body-shape requirements—even horse-riding and motor sport have weight restrictions. Some elite sports require an unhealthily large body shape. Sumo wrestlers and some American footballers suffer dramatically increased mortality from weight-related causes. Emmanuel Yarborough is a sumo wrestler who weighs 390 kg—this weight is not healthy.

31. Dysfunctional eating also seems to create a high incidence of menstrual dysfunction and stress fractures in female athletes. The rates are shockingly high—Beals studied a group of female college athletes and found that 37% had suffered some form of menstrual dysfunction, and 37% had suffered a stress fracture.¹⁹

32. A number of sports have a high risk of Mild Traumatic Brain Injuries—boxing and football are predictable examples, but also skiing, snowboarding, cycling, and horse-riding.²⁰ One group found that the brains of athletes with these injuries couldn't be differentiated from the brains of people who were abusing recreational drugs.²¹

33. Depending on the sport, at elite levels athletes are always at high risk of some sort of accidental injury. In American football there is nearly one "significant" injury per game—meaning it caused them to miss at least one game.²²

34. In the Australian Football League from 1997 to 2000, teams of 40 players had around 40 new injuries per season.²³ Playing these sports at an elite level commits you to about one injury every year. If a drug had this kind of risk factor, it would bring about a major witch-hunt. But these baseline risks are imposed on

¹⁵ Claessens, P et al (1999) Ventricular premature beats in triathletes: still a physiological phenomenon? *Cardiology*;92(1):28–38.

¹⁶ Nieman, DC (2000) Special feature for the Olympics: Effects of exercise on the immune system: Exercise effects on systemic immunity. *Immunol Cell Biol*;78(5):496–501.

¹⁷ Gleeson M 2000. The scientific basis of practical strategies to maintain immunocompetence in elite athletes. *Exerc Immunol Rev.* 6:75–101.

¹⁸ Sundot-Borgen, J (1994) Risks and trigger factors for the development of eating disorders in female elite athletes. *Med Sci Sports Exerc*;26(4):414–9.

¹⁹ Beals, K (2001) Changes in the prevalence of risk factors for the female athletic triad among collegiate athletes over a two-year period. Abstract. *Med Sci Sports Exerc*;33(S5).

²⁰ Freeman, Jason R; Barth, Jeffrey T; Broshek, Donna K; Plehn, Kirsten. 2005. Sports injuries in Silver, Jonathan M (ED); McAllister, Thomas W (ED); Yudofsky, Stuart C (ED). *Textbook of traumatic brain injury*. Washington, DC, US: American Psychiatric Publishing, Inc pp 453–476.

²¹ Iverson, Grant L; Lange, Rael T; Franzen, Michael D 2005. Effects of mild traumatic brain injury cannot be differentiated from substance abuse. *Brain Injury*. Vol 19(1) pp 15–25.

²² Nicholas J A, Rosenthal P P, Gleim G W. (1998) A historical perspective of injuries in professional football. Twenty-six years of game-related events. *JAMA*; 260(7):939–44.

²³ Orchard J, Seward H. (2005) Epidemiology of injuries in the Australian Football League, seasons 1997–2000. *Br J Sports Med*; 36(1):39–44.

every athlete who accepts a place in one of these teams. Some sports have chronic health conditions in almost every elite participant—for example, top-tier trampolinists have an 80% incidence of stress urinary incontinence.²⁴

35. Injuries are not limited to ankle sprains or concussion either. From 1990 to 1999, 14 people died playing Australian Rules football, mostly from brain injury following collisions between players.²⁵ None of the deaths were drug-related. Australian Rules is a comparatively dangerous sport, but it comprises only a tiny fraction of the total number of sportspeople worldwide who play high-impact, contact sports. It is difficult to ascertain the number of deaths caused by anabolic steroids every year worldwide, but to be comparable to the baseline risk of injury in elite contact sports, there would have to be hundreds or even thousands of such deaths every year. It doesn't seem like there are anything like that many.

36. Playing sport at an elite level is not suicide, but neither is the use of growth hormone. To be sure, elite athletes are probably more healthy on the whole than any morbidly obese person. But elite athletes in some sports can expect to have a serious medical problem every year or two. This is not true of EPO, taken at sensible dosage.

37. Elite sport without performance enhancing drugs is not safe. It will continue to get less safe as athlete wages go up, and they push the performance limits harder and harder. It is not made significantly less safe through the use of existing performance enhancing drugs, even if everyone uses them. It is inconsistent to crack down on drugs for health reasons when we don't mind if athletes consent to be injured all the time.

38. If we are concerned about health, we should evaluate health. It is far easier to test haematocrit, or the red blood cell level in the blood, than it is to try to detect EPO or whether someone has been using a transfusion machine. We can set a safe limit, say 50% as is the case in cycling, and allow anyone to compete who is below that and ban everyone who is above that, for whatever cause, because it is unsafe to compete. We can evaluate heart size and function, heart rhythm and other cardiac parameters and disqualify athletes who are at risk, whether the cause is natural variation, training or use of steroids or growth hormone. And we could consider the limits on damage which will have later effects—we could evaluate joint structure and function and disqualify athletes if they were likely to get arthritis in the future, if we thought that health was very important.

39. It is sometimes objected that allowing performance enhancement is unfair and we want “a level playing field.” However, sport is a test of genetic inequality. The starkest example is the Finnish skier Eero Maentyranta. In 1964, he won three gold medals. Subsequently it was found he had a genetic mutation that meant that he “naturally” had 40–50% more red blood cells than average.²⁶ There is no good reason to privilege genetic inequality.

40. Allowing performance enhancement need not discriminate against poorer countries. The cost of a hypoxic air machine and tent is around US\$7,000. Epogen (EPO) costs the athlete about US\$122 per month. Drugs may be cheaper than expensive training facilities that achieve the same effect.

41. In sum, performance enhancement is not against the spirit of sport; it is the spirit of sport. To choose to be better is to be human. Concern for athletic welfare should be paramount. But taking drugs is not necessarily cheating. The legalization of drugs in sport may be fairer and safer. There is nothing wrong with an enhanced competition.

42. The limits to the use of drugs and other performance enhancers in sport should be on safety grounds, based on a consistent comparison with other risks taken in elite sport, and their use should not corrupt the nature of that activity (eg creating webbed feet or using flippers in swimming).

43. We should redirect scarce resources to protect athletes' health and be less concerned with whether some biological substance or intervention improves performance, *per se*.

May 2006

²⁴ Bo K 2004. Urinary incontinence, pelvic floor dysfunction, exercise and sport. *Sports Medicine*. 34(7):451–64.

²⁵ McCrory P R, Berkovic S F, Cordner S M. (2000). Deaths due to brain injury among footballers in Victoria, 1968–1999. *MJA*; 172:217–219.

²⁶ Booth, F, Tseng, B, Flück, M, Carson, J. 1998 Molecular and cellular adaptation of muscle in response to physical training. *Acta Physiol Scand* 162: 343–350.

Memorandum from Michele Verroken²⁷

INTRODUCTION

I am submitting this evidence to the Select Committee Inquiry into HET in Sport as an individual expert with significant experience of elite sport, management of anti-doping policies, procedures and outcomes. My fundamental belief is that sport should not require athletes to cheat to perform and win. I intend this evidence to raise questions about current as well as future capacity to enhance performance in sport and about the mechanisms for minimising the use of illegal HETs at the 2012 Olympics.

HUMAN ENHANCEMENT TECHNOLOGIES IN SPORT

BACKGROUND

1. Presently sport has agreed a regulatory framework to control the misuse of defined doping substances and methods. This regulatory framework, the World Anti-Doping Code is obligatory on all sports and all athletes, Governments have agreed to accept the Code and its operating standards through a government to government convention under UNESCO. Whilst some governments have enacted legislation to address the issue of doping in sport, others including the United Kingdom have adopted policies and procedures to comply with the Convention and Code.

2. The World Anti-Doping Agency is currently consulting on revisions to the Code which was originally published in 2003, it is anticipated that the revised Code will be presented at the World Conference in 2007. With this cycle of review it is possible that a further revision could take place before the 2012 Games. However certain aspects of the Code were hard fought for and are unlikely to be changed, for example the principle of strict liability (which places primary responsibility on the athlete for anti-doping rule violations), a system for therapeutic use approval, standard sanctions, a common prohibited list and the authority of WADA to appeal decisions by sports federations to the Court of Arbitration for Sport.

3. On the one hand the Code has been a major step forward in harmonising certain aspects of drug misuse management across different sports and countries of the world. In particular sports now adopt one consistent list of doping substances and methods. The prohibited substances and methods are defined by the Code according to their ability (perceived or actual) to meet two of three criteria, performance enhancement, damage to health, spirit of sport. In reality some doping substances or methods are not necessarily performance enhancing or supported by evidence of their performance enhancing capacity in published scientific research.

4. On the other hand Code compliance has significantly occupied the sporting agenda. Debate about what should and should not be allowed in respect of performance enhancement is led by the World Anti-Doping Agency, who determines what should be added to the prohibited list. Ability to detect substances or methods is not a prerequisite of inclusion on the prohibited list. Consequently the performance systems have evolved around the development of enhancement techniques and anti-doping systems have looked at what is being used to enhance performance, determined whether it should be prohibited and whether it can be detected by the testing programme or identified through accepted ways of obtaining evidence.

5. Enhancement of human performance is dominated by the need to avoid techniques being identified as prohibited under the Code and detected by the Code's control procedures. In such a climate it is clear that this has created potential weaknesses in the sports and anti-doping systems.

POTENTIAL FOR DIFFERENT HETs TO BE USED TO ENHANCE SPORTING PERFORMANCE

6. Legal and illegal HETs are being used now, and will continue to be used by athletes. The potential for using HET to enhance sporting performance is influenced by access athletes have to enhancement techniques, pressures to perform and the rewards available for sporting success. Outlined below is a summary of the potential opportunities for use of HETs.

7. The pressure upon athletes to win, to deliver a world class performance is immense. Some athletes will do anything to perform well, simply to be a world class athlete requires a level of commitment above the norm. Athletes are used to making personal sacrifices and compromises in pursuit of their objectives, this includes using HETs.

²⁷ Director of the sports business consultancy SPORTING INTEGRITY, Secretary of the Commonwealth Games Federation Medical Commission, Executive Board Member of Hertfordshire County Sports Partnership, Former Director of Ethics and Anti-Doping at UK Sport, Former Vice President of the Association of National Anti-Doping Organisations, Founding Member of the Irish Sports Council Anti-Doping Committee, Secretary of the UK Nandrolone Review Committee. Architect of the UK's Drug Information Database. Awarded the Alan Apley Memorial Medal by the British Orthopaedic Association 2005. Post Graduate Certificate in Sports Law, 2001, King's College, London, Master of Arts in the Faculty of Education, 1985, University of London Institute of Education (specialist study into power relations between sport and government), Bachelor of Education (Honours), Movement Studies 1977, University of London, Certificate in Education (Distinction), Art and Science of Movement and Biology, 1976, University of London, Dartford College of Physical Education, Accredited Commercial and Sports Mediator, 2005, Chartered Institute of Arbitrators, Qualified Arbitrator and Adjudicator, including sports adjudication, 2004, Diploma in Process Improvements 2003, NCFE, BSI Diploma in Quality Management, 2003, BSI Management Systems & Newcastle College.

8. Athletes continually search for techniques that may assist their performances, from coaching to supplements. Athletes consider medical and sports science support services as a necessary part of their lives to maintain performance. Promoting medical treatments and sports science techniques to athletes contributes to a culture of acceptance of assisted performance, making it more difficult to determine what is acceptable.

9. For many in sport, the anti-doping rules are regarded as a limiting factor to the achievement of greater sporting performances and a negative side in the provision of performance support systems. Many of the currently prohibited doping methods were actually introduced to sport as medical treatments or techniques to assist performance or speed up recovery and injuries. (Example blood doping, hypoxic chambers, intra-articular corticosteroid injections, blood cell treatments at injury sites.)

10. Use of methods to determine potential performance capacity in young athletes (ie talent identification programmes) provide a starting point for the early introduction of techniques to improve performance, whether this be diet or training regimes. For the most part these techniques are permitted under the Code. Talented athletes are expected to be tracked through performance pathways in their respective sports and encouraged to engage in support programmes to improve performance. Most young athletes are encouraged to work with performance coaches and attend elite training centres; hence the culture of assisted performance (use of techniques to improve performance) can be established at a very early age. Consequently in the sporting world there is often a confusion of the message, we want you to win but not by any means, the limitation is written in doping regulations; unless specifically defined as doping it is permitted.

11. Competing athletes may be subject to physiological testing to identify fitness parameters and to target improvements. This emphasises the culture of reliance upon assisted performance. For injured athletes medical support programmes are available to work intensively on returning the athlete to fitness as quickly as possible. Use of advanced medical interventions to accelerate injury repair is available to those with access to the expertise and necessary finance. It is sometimes unclear whether these techniques are recognised by the medical profession, are supported by evidence of efficacy or are known to the anti-doping authorities.

12. That is not to say these techniques are wrong simply that they establish the culture of human enhancement and an expectation that assisted performance is acceptable unless otherwise prohibited. Medical interventions push the boundaries of athlete treatment and training as far as possible. Where medical interventions and physiological testing are directed and controlled by organisations who may have vested interests in the improvement of or rapid recovery and return of athletes to performance, this provides opportunities to exploit HETs and weaknesses in anti-doping systems.

13. Reports from the United States indicate that parents obtained growth hormone to assist their children meet the minimum height requirements for college basketball, following premature deaths of young athletes education campaigns warn of the signs and dangers of steroid abuse.

14. Where athletes rely upon funding based upon their performance targets, they may be more receptive to performance enhancement technologies as a means to improve. This situation was identified by the extensive inquiry in Canada following the disqualification of several Canadian athletes for doping offences at the Seoul Olympic Games 1988. The recommendations and conclusions of this report continue to be relevant to the Select Committee's inquiry:

“As a society we have created a climate of sport in which the only good is perceived to be winning and the manner of doing so of no consequence. If winning a gold medal in Olympic competition is the only achievement worthy of recognition, then everything is permissible in order to win.”

Commission of Inquiry into the Use of Drugs and Banned Practices intended to Increase Athletic Performance
Hon Charles Dubin 1990

15. Dubin also concluded that the degree of government involvement in sport in Canada at that time was neither healthy nor appropriate for sport. Comparisons may be made with the current arrangements for the UK's elite sports system which has a strong emphasis on elite sport and international success using performance objectives that have been agreed with Government and which determine funding for the national sports organisations, thus reducing their independence to administer their sport. Today measures of success for government funding in the UK are closely linked to the winning of medals.

16. At an Olympic Games, an athlete needs to be able to produce peak performances. The Games are held once every four years but hosted maybe once in a lifetime in your own country. Financial incentives to perform well are greater. Athletes are under immense pressures to perform well and be injury free at an Olympics, many take the risk of using performance enhancing drugs even though they are fully aware there will be testing. Evidence from the test data from the last 10 Olympic Games demonstrate improvements in testing, as well as an increasing abuse of the doping rules.

OLYMPIC DRUG TESTING

	Athletes Tes ted				Pos itive Tests
1968 Mexico City	667				1
1972 Munich	2,079				7
1976 Montreal	786				11
1980 Moscow	645				0
1984 Los Angeles	1,507				12
1988 Seoul	1,598				10
1992 Barcelona	1,848				5
1996 Atlanta	1,923				2
2000 Sydney	2,758				11
2004 Athens	3667				26*

— some cases still be to be concluded.

17. Gene doping presents the biggest threat to sport, although the technology is not as readily available as other HETs. Anti-Doping programmes are reliant upon testing and detection of genetic manipulation is not within the capacity of current testing systems. Perhaps the biggest challenge will come from research into gene therapy, to correct defective genes responsible for disease as the potential exclusion of one group (athletes) from the benefits of this form of therapy would create social discrimination. Treatment of somatic cells could provide effective treatment of diseases and conditions without altering the human species. However would treatment of germ cells manipulate inherited characteristics and lead to long term risks, developing unknown abnormalities in future generations? Certainly genetic manipulation could help produce the ultimate athlete. It is debatable whether such assisted performance would become acceptable in sport, although it would not be detectable by current testing procedures. Athletes would have to be subject to full body cellular scans, a technology yet to be developed, if specific genetic manipulations of certain athletic performance characteristics are to be identified.

STEPS THAT COULD BE TAKEN TO MINIMISE THE USE OF HETs AT THE 2012 OLYMPICS

18. HETs referred to in this section are defined as those substances and methods prohibited in sport.

19. Some HETs are controlled under the Misuse of Drugs Act; however no mechanism presently exists to follow up findings in the sports drug testing programme with investigations that may lead to prosecutions under this legislation. This legislation classifies amphetamines as Class A, controlling possession and supply and steroid substances as Class C, and illegal to supply. No published guidance exists to determine the quantity of steroids that would constitute supply. Unless this is rectified before 2012 it leaves a loophole in the legislation that could allow steroids to be imported to the UK during the Olympic preparation period and Games with impunity, the carrier would simply claim personal use. Furthermore strengthening legislation to allow seizures of steroids and other performance enhancing drugs to be made, as undertaken by the French police around the Tour de France would also demonstrate the UK's commitment to control these substances.

20. Steps should be taken to reduce the availability of steroid substances including legislation to control the availability of these substances via the internet, and the regulation and licensing of gymnasias where steroid substances can be easily obtained.

Improvements to Testing

21. To minimise the use of HETs in 2012 significant improvements should be made to the current UK anti-doping policy and programme. There is heavy reliance on the drug testing programme to deter athletes from using prohibited substances and methods and to catch those that do. Therefore testing must be of the

highest quality. The UK's testing programme must include routine testing of blood which is a basic prerequisite for detection of certain prohibited substances and methods, such as growth hormone and EPO, presently it does not routinely carry out blood tests.

22. Test data is often quoted by organisations as evidence of drug-free status, however the validity of such data is limited and needs improvement. The DCMS Select Committee Report 2004 concluded "we found the information available related to current levels of drug use in sport to be unsatisfactory. We asked UK Sport to set out its drug test data in the context of: the various numbers of sportspeople eligible for testing in each sport; the estimated annual number of competitions in each category; and the split between 'public interest' tests provided by UK Sport as opposed to those purchased by sports governing bodies. UK Sport responded that "no data collection system currently exists for the specifics of those questions. Providing such information would entail a considerable amount of time and human resources beyond current UK Sport capacity."

23. Improvements to the accuracy and adequacy of test data would give greater public assurance that a sufficient testing programmes are being delivered. Further comparative data should include the level of public financial investment made in each sport, sponsorship available to sports bodies and individual athletes. Much of the data published is incomplete, indicating only tests collected and analysed. Data should include tests that were cancelled (with reasons for cancellation), tests where athletes are not available (presently these are subject to further review by the governing body before the test may be accepted as contributing towards a doping offence, three missed tests constitute a doping offence under the WADA Code). It is apparent that some athletes would prefer to record a missed test than to submit to a test when there was a possibility that they would test positive for a prohibited substance.

24. There should be greater transparency of information regarding the HETs used with elite athletes (eg haematological profiling) carried out through the UK's Sports Institute network to demonstrate that these HETs are within current acceptable parameters.

Different Approaches

25. Fundamental changes to existing arrangements should be considered to increase the effectiveness of testing.

26. Presently laboratories analyse the urine samples blind (ie the laboratories analyse each sample individually and anonymously). This loses an opportunity to create a profile for each athlete which would make HET use easier to identify.

27. Athletes could begin their athletic career by registering for a doping control passport, including a full screen. Analytical data could be added from each test so that variations in hormone profiles would be easier to track.

28. Rather than the rules prohibiting a specific list of substances and methods, an alternative approach for human sport would be to adopt the principle of prohibiting all substances and requiring competing athletes to seek approval for any substance or method they wish to use in advance. Emergency medical treatments could be permitted and verified. Use of prohibited substances may be considered in relation to eligibility to compete.

29. Alternative methods of testing athletes should be investigated and funded. Such methods could address the often quoted limitation of high cost of analysis. Testing methods should be developed to allow for frequent testing of athletes, on a daily basis (as appropriate to the identification of substances and their excretion rate from the body). Samples could be stored and randomly selected for analysis. Retrospective testing of samples could be undertaken where profiles were identified as unusual.

30. Alternatives to urine and blood testing that include DNA as a mechanism to verify the identity of an athlete should be investigated. Research from the United States into the collection and analysis of saliva indicates potential. Saliva samples may be stored for over 10 years without degradation and analysis could provide detection capacity for HETs currently prohibited in sport. Such mass testing may be controversial as it offers the possibility of regular testing of all athletes eligible for the 2012 Games from two years before the Games with evidence that could be used up to eight years beyond (the current statute of limitation under the WADA Code).

31. Redefining doping offences as a form of sporting fraud would focus attention upon the impact of doping on sport. In keeping with other criminal legislation, athletes should not be permitted to benefit from their fraudulent conduct. The athlete passport could be used to record the financial rewards paid and to establish the value to be repaid when a doping offence occurs. Career penalties would send the strongest message to athletes.

32. Formal investigation procedures under a Sports Ombudsman (as recommended by the Independent Sport Review 2005) are needed to investigate allegations of involvement in doping and inadequacies in the anti-doping system. Presently this responsibility is with sports organisations that have vested interests and

limited authority to investigate thoroughly especially where this may involve professional conduct issues and sanctions.

33. The UK needs tighter controls on the manufacture, supply chain and prescription of HETs to reduce their availability on the black market and increase the accountability of manufacturers.

THE STATE OF UK RESEARCH AND SKILLS BASE UNDERPINNING THE DEVELOPMENT OF NEW HETs AND TECHNOLOGIES TO FACILITATE THEIR DETECTION

34. Significant expertise to develop HETs is available in the UK; research is not well funded by the anti-doping authorities, particularly for detection, however in the medical and pharmaceutical industry similar research is being undertaken which could be applied.

35. Core funding of accredited laboratories occurs in other countries and could be considered for the UK, as testing purchased by governing bodies is limited by its cost.

36. The UK needs greater coordination across government departments to share information and create a coordinated response to prohibited HETs and to seek involvement of expertise that is independent of the national anti-doping system in sport.

May 2006

Memorandum from GH—2004

DETECTING GROWTH HORMONE ABUSE

Executive Summary

- GH-2004 is a research study funded by the World Anti Doping Agency (WADA) and the United States Anti Doping Agency (USADA). It “stands on the shoulders of” GH-2000, a multi-national research project funded by the European Union (EU) and the International Olympic Committee (IOC), that developed the “marker method” for detecting growth hormone (GH) abuse. The “marker” method of detecting GH abuse was developed using rigorous scientific methods.
- GH-2004 aims to validate this methodology across a spectrum of ethnic groups and sporting scenarios. Further validation has also been undertaken using data collected by other unrelated but collaborating research groups:
 - It has been shown that the GH-2000 discriminant functions work as well in detecting those taking GH in an unrelated German GH administration study as it does on the original UK data.
 - It has been shown that the GH-2000 discriminant function did not generate any false positives when applied to more than 1,000 blood samples from a variety of elite athletes from many ethnic groups in Europe, Australia and Japan.
 - Sporting injuries do not lead to false positive results.
 - The “marker” test will detect GH abuse in a wide range of ethnic groups.
- Variation between commercial assays for the markers is a significant problem.

Proposal

- UK Sport leads the world by initiating a study of the operational viability of this test of GH abuse in the run up to the London Olympic Games.
- UK Sport leads the world to accumulate experience of testing and re-testing volunteer athletes to allow them to demonstrate that their “passports are clean” so far as growth hormone is concerned.
- We undertake further research to develop more suitable assays for the markers IGF-I and P-III-P.

INTRODUCTION

1.1 Over the last two decades, there has been accumulating evidence that growth hormone (GH) is widely abused by athletes for its anabolic and lipolytic properties. Its use was banned by the International Olympic Committee (IOC) in 1989 and GH appears on the World Anti Doping Agency (WADA) list of prohibited substances. The detection of exogenously administered GH poses a formidable challenge, as it is almost identical to that which is produced naturally in the body. A major multi-national European research project—GH-2000, led by Professor Peter Sonksen of St Thomas’ Hospital, London and funded jointly by

the European Union (EU) and the IOC proposed a detection method based on the measurement of two GH-dependent blood markers, insulin-like growth factor—I (IGF-I) and type 3 pro-collagen (P-III-P), both of which rise in response to growth hormone administration in a dose dependent manner. The changes in these markers during a placebo controlled double blind GH administration study were used to construct gender specific formulae that gave good discrimination between those taking GH and those taking placebo.

1.2 The results of this study were presented to the IOC at a workshop in Rome in March 1999. The conclusion of the workshop was that although the results presented were of considerable interest and importance, further validation studies needed to be undertaken before the test would be robust enough to withstand the forensic examination that would be needed to win a case in the Court of Arbitration in Sport (CAS). The particular validation studies considered of most importance were:

1. Confirmation that there were no significant racial or ethnic effects that might influence the interpretation of results.
2. Confirmation that the effects of injury would not influence the interpretation of results.

1.3 Funding for a further multi-national research project necessary to answer these points—GH-2004—was sought from the EU but although reaching the final stage it was not financed on the basis of cost. Meanwhile, the IOC under its new President Jacques Rogge was re-organising the structure of its Doping Laboratories through the creation of “The World Anti-Doping Agency—WADA”. Under the new structure the IOC no longer funded research and this was taken over by WADA. The proposal for GH-2004 was submitted to WADA who responded that they were interested in funding a “cut down” version of the project based wholly in the UK (where they considered that there was sufficient ethnic diversity to enable the research).

1.4 Meanwhile the United States Anti Doping Agency (USADA) also had a call for proposals for research on methods for the detection of GH abuse. Professor Sonksen had retired from his post at St Thomas’ Hospital (to live near Winchester, Hampshire) and wished to continue (and hopefully complete) this research and for this he sought the help of Dr Richard Holt (Senior Lecturer in the Medical School at Southampton) to submit a joint application for funding. Dr Holt had previously been a Lecturer with Professor Sonksen in London.

1.5 A research proposal for GH-2004 was then submitted to both WADA and USADA from the Medical School at Southampton with Professor Sonksen and Dr Holt as joint “Principal Investigators”. Approval for a grant to cover most of the project was approved by USADA on 24 December 2002, three days before a skiing accident that left Professor Sonksen severely disabled with a spinal cord injury. Dr Holt took de facto control of the project although Professor Sonksen was able to re-join the project after leaving hospital in the summer of 2003. WADA later agreed to contribute a further tranche to complete the necessary finance.

1.6 The details of this project are given at: <http://www.gh2004.soton.ac.uk/>. The project base at Southampton University was recently reviewed by Richard Caborn MP (Minister of Sport).

1.7 The project is now nearing completion, all the studies have been finished and the thousands of blood samples collected have been analysed by Professor David Cowan’s team at The UK IOC/WADA-Accredited Laboratory at King’s College, London. The results are currently being analysed by the team statisticians and the results will shortly be submitted to leading scientific journals for peer-reviewed publication. Some preliminary results have been presented in a recent closed USAD/WADA workshop in the USA.

1.8 In summary, these results strongly supported the conclusions previously reported by the GH-2000 group and showed no evidence of a significant “ethnic” effect that might interfere with the global use of the test. The preliminary results also showed no important “injury” effect that might interfere with the test.

1.9 Meanwhile a number of papers from independent research groups have been published that contribute usefully to the validation of this approach (now commonly referred to as the “marker method”). The most important of these came from the IOC/WADA accredited laboratory at Kreischa in Germany.

1.10 Investigators at the Kreischa laboratory undertook a further placebo controlled double blind GH administration study and developed an alternative formula based on IGF-I and P-III-P but also including IGF-I Binding Protein 3—IGFBP3.

1.11 The statistical procedure used to generate the discriminant functions by both research groups (GH-2000 and Kreischa), involved splitting the data collected into two; a “training” set of data to calculate the discriminant function and a “confirmatory” set for validating the sensitivity and specificity of the discriminant function and determines whether the function is successful in discriminating between the treatment groups. The confirmatory set is required in order to ensure the model is applicable to the general population and not just the “training” set. There is a valid criticism of this approach that sees it as a potentially “self-fulfilling” method. Ideally, further validation is needed using completely independent data sets to evaluate whether the GH discriminant function formulae perform reliably on completely different sets of data.

1.12 We have investigated the validity of the GH-dependent marker approach by assessing whether the GH-2000 discriminant function could be used reliably to detect those receiving GH when applied to the Kreischa dataset.

2. RESULTS

2.1 *Kreischa Study*

The blood samples had been analysed for the GH-sensitive markers using different laboratory methods to those used in GH-2000 and GH-2004 and the results were not directly comparable without manipulation. We developed a method for adjustment based on “normalising” the data using the results from the untreated study populations. This then allowed direct comparison of results.

2.2 Performance of GH-2000 Discriminant Function on “their own” and “the others” laboratory results: Success rates and estimated average sensitivity were calculated using a specificity (“false positive” rate) of approximately of 1 in 10,000 with a cut-off point of 3.7s.d. Sensitivity was calculated as number of observations placed over the 3.7 cut-off value out of the total number of observations for the particular day from volunteers receiving GH treatment. Results in bold are from days during GH administration.

<i>Discriminant Function</i>	<i>Data</i>	<i>Day 3</i>	<i>Day 5</i>	<i>Day 7</i>	<i>Day 9</i>	<i>Day 11</i>	<i>Day 13</i>	<i>Day 16</i>	<i>Day 19</i>
GH-2000	Kreischa	1/10 (10%)	2/10 (20%)	6/10 (60%)	7/10 (70%)	6/10 (60%)	9/10 (90%)	5/10 (50%)	5/10 (50%)

<i>Discriminant Function</i>	<i>Data</i>	<i>Day 21</i>	<i>Day 28</i>	<i>Day 30</i>	<i>Day 33</i>	<i>Day 42</i>	<i>Day 84</i>
GH-2000	GH-2000	23/28 (82%)	24/28 (86%)	13/24 (54%)	7/27 (26%)	2/28 (7%)	0/27 (0%)

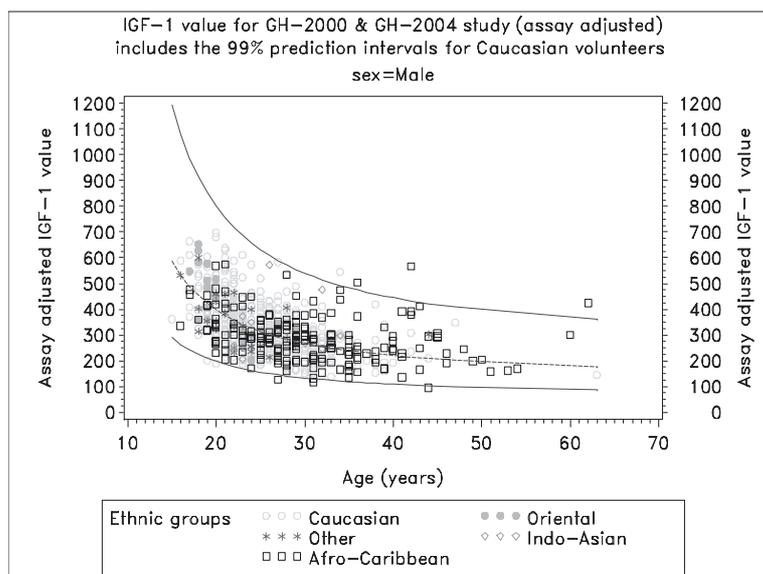
2.3 Thus it can be seen that the GH-2000 Discriminant Function behaves equally well on the Kreischa (90% detected on day 13) as on their own data (> 80% on days 21 and 28 of GH administration). The dose of GH administered in the German study was lower than the lowest in the GH-2000 trial and much lower than that believed to be used by athletes. Because of this the actual sensitivity of the test in practice may well be better than that in the trials.

2.4 This is a most important validation of the GH-2000 discriminant function showing it to have the ability to detect up to 90% of men taking GH and up to 50% of men who stopped taking GH as long as five days ago (Kreischa Day 19) with a false positive rate set at 1:10,000.

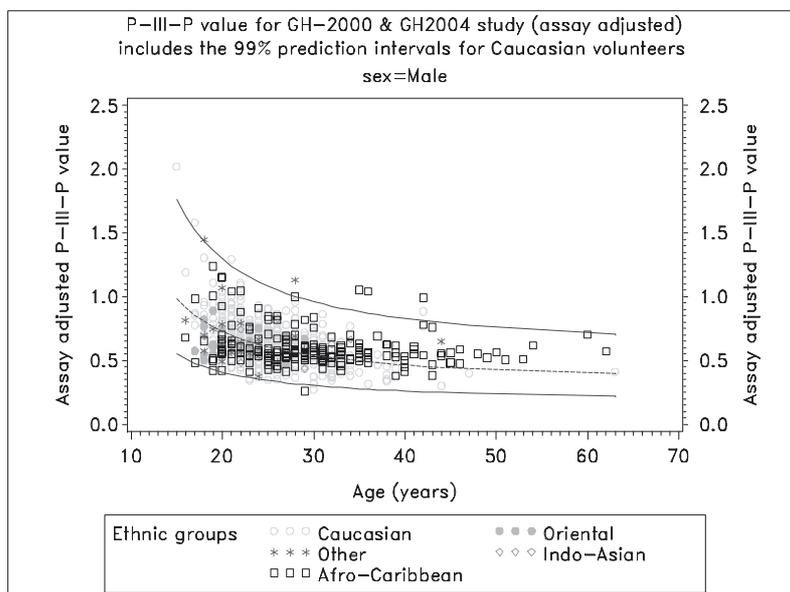
2.5 *The GH-2004 Study*

Only preliminary results are available now but to illustrate the comparability of results of the measurement of marker levels in the blood of volunteer elite athletes from different ethnic groups, Figure 1 shows the (assay adjusted) IGF-I levels against age for volunteers from the different ethnic groups. The blue line shows the 99% confidence intervals (CI) for the Caucasian volunteers. It is clear firstly that the results depend on the age of the athlete and secondly, that the results different ethnic groups scatter randomly across the results from the Caucasians.

2.6 Figure 1



2.7 Figure 2



2.8 It can be seen from Figure 2 that the results of (assay adjusted) P-III-P values from elite volunteers again show a strong age-dependence but do not differ between ethnic groups. The three volunteers with values slightly above the 99% CI of Caucasians are not the same as those above the 99% CI for IGF-I shown in Figure 1 (With > 1,000 results up to 5 values would be expected to exceed the upper 99% CI by chance alone).

2.9 The discriminant function developed by GH-2000 uses both IGF-I and P-III-P and has to have a value above 3.7 to suggest GH abuse. It was not above this value in any of the volunteer athletes. Of course, we do not know that all these athletes were “clean” but the results do suggest that this was the case.

2.10 Collaboration with Professor Ken Ho in Sydney, Australia allowed us a further validation using results he obtained from more than 800 blood samples from a variety of ethnic groups.

- After correction for assay, virtually all of the Australian samples lie within the 99% prediction intervals for the white subjects from the GH-2000 study.
- Application of the male and female discriminant functions to the Australian subjects showed that no individual would have been falsely accused of doping.
- The age correction applied in the GH-2000 study results in a small over-correction in the Australian study. The reason for this is unclear but probably reflects differences in assays.

2.11 Preliminary analysis of the double blind placebo controlled studies of GH administration to volunteers from different ethnic groups shows a similar response in all groups. This indicates that this “marker” approach should be able to detect GH abuse in all ethnic groups.

2.12 Preliminary analysis of the “Injury” study showed no person in whom the discriminant function exceeded the 3.7 cut-off value that indicates GH abuse.

CONCLUSIONS

- The “marker” method of detecting GH abuse has been developed using rigorous scientific methods.
- Validation of this method has been undertaken using data collected by other unrelated research groups.
 - It has been shown that the GH-2000 discriminant functions work as well in detecting those taking GH in an unrelated German GH administration study as it does on the original UK data.
 - It has been shown that the GH-2000 discriminant function did not generate any false positives when applied to more than 1,000 blood samples from a variety of elite athletes from many ethnic groups.
- Sporting injuries do not lead to false positive results.
- The “marker” test will detect GH abuse in a wide range of ethnic groups.
- Variation between commercial assays for the markers is a significant problem.

PROPOSAL

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- We undertake further research to develop more suitable assays for the markers IGF-I and P-III-P.

May 2006

Memorandum from Dr Bruce Hamilton, Chief Medical Officer, UK Athletics

INTRODUCTION

1. As a Physician working full time with Elite Athletes in the field of Sports Medicine, the use and abuse of technology for the Enhancement of performance is a constant conundrum. While superficially often appearing a clear cut delineation between legitimate and illegitimate use of performance enhancing technology, the reality of elite sport means that this distinction is often very blurred. In a world where the World Anti-Doping Agency (WADA) is trying to create a “level playing field”, the athletes and coaches within the elite domain, are searching for ways to “get the edge”. It is in this environment that the sports physician is required to work—challenged by the sport to provide new and innovative means of enhancing recovery and injury prevention and challenged by WADA and their own ethics to work within legitimate means. Entirely appropriate and innovative means of injury rehabilitation/management may well fly in the face of the standards and regulations of WADA creating a challenging environment for the Sports Physician.

2. Despite strong opinions on both the direction that WADA is taking and the inconsistencies it displays in implementing its own code, I will restrict my discussion to those pragmatic issues that I encounter in my clinical practise, looking after elite Track and Field in the United Kingdom.

3. I would like to preface this discussion by highlighting the plight of the “national governing body Doctor”, as “sports medicine” is often implicated in the implementation and development of doping regimens. In my experience, the official team doctor is the last person that potential cheats will be utilising for this information, as this Doctor will invariably have the interests of the entire sport at heart. Hence, if the medical practitioner is involved, it is usually not the governing body official. Furthermore, I would like to state that the views expressed herein are mine, and may not represent the views of UK Athletics.

4. In the following submission I would like to raise some of the issues, with examples, that confront the sports physician, charged with dealing with the health, wellbeing and performance of elite athletes, regarding the use of HET's in sport under each of the four component sections.

POTENTIAL FOR HET'S TO BE USED FOR ENHANCING SPORTS PERFORMANCE

5. By way of introduction to this topic it is necessary to clarify the role of the sports physician working in an elite sports environment. This environment is no longer the domain of the amateur athlete working with his or her slightly eccentric coach, but is now a multi-disciplinary arena in which the Sports Physician often plays a key co-ordinating role. While in the past the Physician was involved in the diagnosis and management of injury, increasingly the Physician is involved in maximising performance—most simply illustrated by the task of preventing injury and illness, and more challengingly, by the application of techniques to optimise performance.

6. As is most clearly demonstrated in team sports, it is often the ability to keep key performers on the track, and not injured, which determines outcome, and hence any techniques utilised to maximise healing and minimise recovery time, should be considered performance enhancing.

7. An example of the maximising recovery from injury or illness may be as simple as the use of anti-oxidant (eg. Vitamin C) medication to prevent illness or enhance injury recovery—a simple procedure, with limited evidence base and well within the bounds of acceptability of most individuals and WADA.

8. To pursue the same example, one of the most complex injuries to manage within our sport is a tendinopathy (for example Achilles tendinopathy). This is an area in which there is increasingly a wide variety of treatment techniques being utilised (eg. Injections such as Sclerosant, homeopathic traumeel, Saline dilatation, Cortisone) but more recently in the equine world, stem cell therapy has been trialled with promising results²⁸. Given the difficulty in treating this condition it is more than likely that, if this therapy were shown to be efficacious, that it could be a reasonable treatment for tendinopathies. In this situation, the use of stem cells may be the most appropriate treatment for a difficult clinical condition, but the use of

²⁸ Smith, R and P Webbon, *Harnessing the stem cell for the treatment of tendon injuries: heralding a new dawn?* British Journal of Sports Medicine, 2005. 39(9): p 582–584.

stem cells in athletes may be frowned upon. One could foresee a situation whereby the athlete is disadvantaged by not being able to utilities what may be an appropriate treatment, as a result of seemingly arbitrary delineations of what is permitted and not permitted. A topical example of this may be the WADA regulations on the use of asthma medications (B2-Agonists) which may negatively impact upon the care of elite athletes²⁹.

9. Further use of stem cells could be envisaged in the area of acute muscle damage, where the use of fibroblasts would clearly be beneficial, with the potential to be injected immediately into the area of damage, thereby enhancing injury repair.

The ability to differentiate between this seemingly legitimate use of stem cells and the use of stem cells for muscle/performance enhancement is unlikely to be possible.

10. The recent identification of a possible genetic predisposition to tendon injury raises the possibility of genetic manipulation as part of both prophylactic and treatment for tendinopathies. While this may be a step forward for medicine, it would significantly challenge the WADA Code as it currently stands.

11. The use of Growth Factors (GF) in sport is prohibited³⁰. However, GF are increasingly utilised in mainstream medicine as a legitimate approach to enhancing healing³¹. They are prohibited in sport primarily as a result of their potential for abuse and performance enhancement. However, as GF technology improves, so will their utilisation. It is very possible that GF will be utilised as part of everyday mainstream management of our most common sports injuries in the near future. This will clearly be at odds with the WADA code.

12. Already techniques such as autologous blood injection and “blood spinning” are believed to work partly by the stimulation of growth factors. These techniques have found some notoriety in the media in recent times, but when used in the manner prescribed is likely beneficial, innovative and appropriate treatment regimen. These techniques are felt to work via the stimulation and activation of the bodies own growth factors, and these techniques are being scrutinised by WADA. The potential for abuse of these GF is theoretical and the ability to differentiate between legitimate and illegitimate use will be limited if not impossible.

13. Hence legitimate medical practice will in the near future challenge anti-doping authorities to accept appropriate forms of innovative intervention despite being at odd with the prohibited list. This will probably require a form of “Therapeutic Use Exemption” as is currently utilised for many medications, but this will not necessarily limit the potential for abuse.

14. The second manner in which medical practitioners may present a challenge is in the area of performance optimisation. Rather than just treating an injury, one may be looking, via a medical intervention, to enhance performance.

15. The least challenging example of this would be the management of an individual athletes ferritin levels. Ferritin is a blood borne measure of Iron Storage in the body. The lower limit of normal is usually in the range of 10 units, however in athletes an optimal range for performance is considered anywhere from 30 units upwards (although this is arbitrary and debated amongst clinicians). Hence this will be artificially elevated through either oral supplementation or injection—despite the athlete appearing to be in good health. This is the least challenging example of medical intervention to enhance performance, but there are many other similar situations. In a confidential medical environment, it is often left to the medical practitioner to make an assessment of the relative merits and ethical considerations of the intervention.

16. I hope that these examples illustrate that human enhancement technologies, or novel medical approaches are both being used currently, and have an immense potential for increased use in the future. The delineation of what is considered legal or illegal will most likely be arbitrary, increasing the difficulty for enforcement. While the initiatives occurring under WADA should be praised, the challenge in the future will be in the encouragement of appropriate medical interventions which enhance the care of our athletes, and the prevention of inappropriate use of those same interventions.

STEPS ABLE TO BE TAKEN TO MINIMISE THE ILLEGAL HET’S IN 2012

17. Recognising that this is not my area of expertise, I can only express my experience. In most situations where performance enhancement has been sought via either legal or illegal means, the coaching staff are a key source of information. For this reason I believe that education (compared with just information) and ethical guidance should be incorporated heavily into coach education at the earliest opportunity.

²⁹ Orellana, J, R Prada, and M Marquez, *Use of B2 agonists in sport: are the present criteria right?* British Journal of Sports Medicine, 2006, 40: p 363–366.

³⁰ WADA, *The World Anti-Doping Code. The 2006 Prohibited List. International Standard.* 2006, World Anti-Doping Agency: Montreal.

³¹ Molloy, T, Y Wang, and G A Murrell, *The roles of growth factors in tendon and ligament healing.* Sports Med, 2003, 33(5): p 381–394.

THE CASE FOR HET'S IN SPORT

18. From a medical perspective, as presented above, it is clear that HET's are already and will progressively be integral to the maintenance of the elite athletes health, wellbeing and hence performance.

19. In my opinion there needs to be recognition of the appropriate use of HET's within the medical environment, and continued vigilance in the fight against inappropriate use. Medical practitioners should not be prevented from utilising appropriate management strategies, just because of their potential for abuse. The health of elite athletes should not be compromised in this manner.

20. WADA has clear guidelines as to why a substance will be included in the permitted list. However, inconsistencies in application of their own guidelines and lack of uniformity between sports and countries, has led to a loss of confidence in the WADA Code. A sound argument can be made for the medicalisation of sport by permitting the controlled use of all medications and techniques, to prevent their "dangerous" use, thereby taking out the need to be concerned with ergogenicity. My own opinion on this is that it depersonalises sport and will take away many of the attractions of sport, thereby destroying sport as we know it. I do however believe that there is a middle ground, whereby WADA place emphasis on the dangers, while de-emphasising the ergogenicity of different agents. This then allows one to rationalise why Nandrolone would stay on the list, but Caffeine would be removed (similarly why Altitude tents may continue to be permitted).

21. It is my belief that government intervention in this area would be very complex. Any direct intervention in order to either encourage or discourage HET use could be interpreted entirely differently depending upon individual interpretation. One mans legitimate ethical position, may be anothers illegitimate—a problem that constantly faces WADA. Furthermore, it is my understanding that WADA was developed for entirely this role, and that any intervention would potentially undermine this.

THE STATE OF UK RESEARCH

22. This is not an area that I am qualified to discuss.

SUMMARY

23. The medical care of elite athletes is an environment conducive to innovation and development, as athletes place the same demands on their practitioners as they do on their coaching staff. As a result sports medicine practitioners are often exploring and challenging conventional thought and management processes, utilising technologies in manners for which they may not have initially been designed. While the utilisation of these technologies is in the best interest of both the athlete and the sport there is no academic challenge, it is when this is not the case that the challenge exists.

May 2006

Memorandum from the British Olympic Association

INTRODUCTION

1. The British Olympic Association (BOA) is the National Olympic Committee (NOC) for Great Britain and Northern Ireland. It was formed in 1905 in the House of Commons, and at that time consisted of seven National Governing Body members. The BOA now includes as its members the 35 National Governing Bodies of each Olympic sport.

2. The BOA is one of 203 NOCs currently recognised by the International Olympic Committee (IOC). The IOC's role is to lead the promotion of Olympism in accordance with the Olympic Charter. The Charter details the philosophy, aims and traditions of the Olympic Movement. The IOC co-opts and elects its members from among such persons as it considers qualified. Members of the IOC are its representatives in their respective countries and not delegates of their countries within the IOC.

3. The BOA is responsible for developing the Olympic Movement within Great Britain and Northern Ireland and facilitating and managing the British Olympic Team (Team GB) at the Olympic and Olympic Winter Games. In addition, the BOA delivers extensive elite level support services to Britain's Olympic athletes and their National Governing Bodies throughout each Olympic cycle to assist them in their preparations for, and performances at the Games.

4. In particular, the Olympic Medical Institute (OMI) is a specialist national support centre for high performance athletes from both Olympic and non-Olympic sports. Established through a partnership initiated by the British Olympic Association to involve the English Institute of Sport, the OMI offers world class support to athletes in the form of residential rehabilitation, outpatient sports medicine and physiotherapy services, squad-based sports physiology and cutting edge research developments. The OMI's highly experienced multi-disciplinary teams provide both short-term and on-going support to athletes from a wide range of sports, offering individually tailored packages that minimise time lost due to injury and

ensure optimal performance. Direct medical support is provided to GB athletes through the Athlete Medical Scheme and Junior Athlete Medical Scheme covering over 1,500 nominated and potential Team GB members. These schemes provide comprehensive medical cover to nominated World Class level athletes and are tailor-made to ensure that the athletes have access to the best sports specific medical advice when required.

5. Great Britain is one of only five countries which have never failed to be represented at the Summer Olympic Games since 1896. Great Britain, France and Switzerland are the only countries to have been present at all Olympic Winter Games. Great Britain has also played host to two Olympic Games in London: in 1908 and 1948. In 2005, London was selected as the host city for the 2012 Olympic Games.

6. The BOA is one of only two NOCs worldwide which does not receive government or public finance. The impartiality this grants the BOA means that it can speak freely as a strong independent voice for British Olympic Sport.

HUMAN ENHANCEMENT TECHNOLOGIES IN SPORT

This submission provides evidence on the Inquiry's four specific areas of interest.

1. The potential for different HETs, including drugs, genetic modification and echnological devices, to be used legally or otherwise for enhancing sporting performance, now and in the future.
7. The pressures placed upon athletes to deliver medal winning performances in the greatest sporting arena, the Olympic Games, is significant. Jacques Rogge, President of the International Olympic Committee stated in 2001 that "doping in sport is the biggest threat to the credibility of sport in the 21st century." Doping in sport is not a new phenomenon with stimulant abuse reported as far back as the ancient Olympic Games and during the 1904 Olympic marathon race. There is no doubt that the advancements in new technologies particularly with regard to genetic engineering, biotechnology and sports surgery procedures will serve to increase the potential of the use of HETs to enhance sporting performances.
8. The BOA recognises that athletes are placed under immense pressure to perform, and as such seeks to reinforce the fundamental principles of fair play which underpin the Olympic Ideal. In 1992, the BOA adopted a bye-law which renders any athlete found guilty of a doping offence ineligible for selection to the Great British Olympic Team (this includes accreditation for support staff and coaches). The BOA's position was supported by the representative body of British athletes, the Athletes' Commission, which sent a clear message that sport and its competitors were supportive of any moves which served to deter athletes from using prohibited HETs and reinforce the ethical values of Olympism.
2. Steps that could be taken to minimise the use of illegal HETs at the 2012 Olympics.
9. Through its doping bye-law, the BOA has taken an extremely strong stance in order to minimise the use of prohibited HETs amongst Team GB athletes at any Olympic Games, including during the lead-up to the London Games in 2012. In order to enhance the remit of the position, particularly in the lead up to London 2012, the education programme for those young athletes currently training as part of development or junior squads should include anti-doping elements and information on the BOA's standpoint.
10. The BOA ensures that all potential Team GB athletes are included in UK Sport's testing programme within the six months leading up to an Olympic and Olympic Winter Games. As part of the Team Member's Agreement signed by each member of Team GB, athletes specifically agree to comply with the WADC.
3. The case, both scientific and ethical, for allowing the use of different HETs in sport and the role of the public, Government and Parliament in influencing the regulatory framework for the use of HETs in sport.
11. There is no case for allowing the use of prohibited HETs in sport, based on the ethical argument that "cheating" as such compromises the Olympic ideal and the fundamental principles of Olympism. The Olympic Movement Medical Code (please see Appendix 1) came into effect on 1 January 2006 and was ratified by the BOA as the NOC for Great Britain and Northern Ireland. The Code states that the Olympic Movement "should take care that sport is practiced without danger to the health of the athletes and with respect for fair play and sports ethics."
4. The state of the UK research and skills base underpinning the development of new HETs, and technologies to facilitate their detection.
12. At present the level of UK research and skills surrounding the area of new HETs is limited. Over the past decade the UK has brought its anti-doping system in line with the World Anti-Doping Agency Code (WADC). UK Sport is mandated by the Government to be the national anti-doping organisation and carries out the anti-doping programme throughout the UK. The programme primarily focuses on the management of the operational testing procedures and educational elements, with limited resource to research the multifaceted area of HETs.
13. The fact that the UK's anti-doping programme is co-located within the same organisation which has the responsibility for the elite sport funding programme continues to be a contentious issue. The BOA's position has been clarified in the past, and as such concludes that there is a perceived conflict between the two areas of responsibility. The anti-doping programme should be independent; independent from

individual sports, the sports funding agency and political influence. Neither the testing, disciplinary and eligibility aspects of the anti-doping programme should be associated with the agency which funds the elite sport system. Dr Roger Jackson reviewed the UK's anti-doping system in 2001 and commented that: "the agency should operate independently of sport governing bodies (that, for example apply sanctions), sport funding agencies (that, for example withhold funding if there is a doping infraction), and governments (that, for example fund the system), to ensure the credibility of the task."³² An independent anti-doping agency follows the example of emerging world's best practice, for example, the United States Anti-Doping Agency (USADA), the Australian Sports Anti-Doping Authority (ASADA) and the Canadian Centre for Ethics in Sport (CCES).

May 2006

Memorandum from Professor Ian McGrath, Institute of Biomedical & Life Sciences

The Committee's concerns are timely both for coordinating action prior to the Olympics and in the context of the current state of knowledge and research in the area of human performance. However, the timetable is tight.

Here at Glasgow University we have recognised the importance of taking a view of human performance centred on normal physiology but ranging from impairment in illness to relative enhancement at the limits of sporting performance. To this end we have set up the Institute for Diet, Exercise and Lifestyle (IDEAL). This brings together experts in physiology, pharmacology, genetics, biochemistry and nutrition to tackle a range of topics involving the interaction of diet, exercise and other life-style factors on normal, illness-impaired and sporting performance and in the changes that take place over the life cycle from childhood to old-age. On the biomedical side this relates to rehabilitation as well as to the lifestyle factors causing illness. However, the sports side provides significant insights on how to optimise normal performance as well as indicating the physiology of the limits of normal performance. There is great synergy between the biomedical issues and elite performance since both relate to how the "normal" range is perturbed.

We believe that this philosophy should also lie behind any attempt to understand human enhancement technologies and this is the context for our response.

The potential for different HETs, including drugs, genetic modification and technological devices, to be used legally or otherwise for enhancing sporting performance, now and in the future.

Scientific knowledge on the optimisation or supra-optimisation of normal human performance will continue to develop. Keeping tabs on this requires expert knowledge across several fields including physiology, pharmacology, genetics, biochemistry, nutrition and bio-engineering.

Steps that could be taken to minimise the use of illegal HETs at the 2012 Olympics.

Vigilance and subsequent regulation and testing require top quality research. Much research in Sports-related topics is not cutting edge and does not have sufficient scientific depth. This type of work is not currently well supported by the research councils, presumably because it does not provide as much benefit to society as does more obviously biomedical research. Such research as there is often is supported by commercial sources that are not neutral. Research could be sponsored that is based on existing biomedical facilities. This might need to be based on consortia of laboratories in order to achieve breadth of interdisciplinary expertise.

One starting point might be a high level scientific conference or workshop aimed at highlighting the issues amongst the scientific community and the funding bodies. (The Physiological Society would be interested in promoting this—see below.)

The case, both scientific and ethical, for allowing the use of different HETs in sport and the role of the public, Government and Parliament in influencing the regulatory framework for the use of HETs in sport.

This ethical debate needs to be informed by solid physiological knowledge. One of the problems with current testing regimes is that the setting of what is "normal" is often open to legitimate challenge because it is based on "soft" scientific data. The concepts of "harm" and "fairness" are influenced by understanding what is within the "acceptable" normal range. Thus, better data is required and decision taking should involve those who understand the data thoroughly.

³² Suggested Changes to the United Kingdom Anti-Doping Agency, and its Policy and Regulations. Dr Roger Jackson, Chairman, Canadian Centre for Ethics in Sport (May 2001).

The state of the UK research and skills base underpinning the development of new HETs, and technologies to facilitate their detection.

We have alluded to this above. The skills base (physiology in health and disease, genetics and biochemistry) is there but it is not being directed towards these ends and will not be unless funding directs it.

I hope that these comments are helpful. We would be very pleased to pursue the necessary research in IDEAL since this fits well with our current efforts. For example we have established ICEARS (The International Centre for East African Running Studies) that seeks a scientific basis for the dominance of East Africans in endurance running, and we have formed an international consortium to work with WADA to establish a better basis for drug-testing that includes genetic profiling, which we believe is the future of such endeavours.

Finally, I would like to propose, in my role as Chairman of The Physiological Society, that the Society work with the Committee to generate the necessary scientific meetings, workshops or other fora to take these matters forward.

August 2006

Memorandum from Dr H Hoppeler, Institute of Anatomy, University of Bern

With regard to your enquiry I can only say that I agree entirely that “Gene Therapy” is not one of the great threats in human enhancement technologies. There are many current drawbacks which make the gene approach very unattractive. Apart from the fact that “gene dosage” will be extremely difficult; gene interventions are very likely to be detectable for very long times (maybe during a lifetime) as they leave immunological traces. Whether these can be detected is more a matter of technique than a matter of principle.

What we fear in Switzerland is “gene doping” via the internet whereby some low tech lab may offer cheap “genetic enhancements” to athletes or would be athletes. Looking at the latest doping scandal in Spain—the risk behaviour of some athletes (in this case Tyler Hamilton) is such that some athletes probably take any risk for the chance of a performance enhancement.

We are currently working on a prevention campaign against “criminal gene doping”. A major drawback of the current system is that WADA doping rules are not uniformly enforced worldwide. In particular we fear countries in which the success of their athletes is a political instrument. It may therefore be an important move of the IOC to have Olympic Games in China—as this will put enormous pressure on China to comply with current standards. We (as developed Nations) also need to support the many countries that simply lack the means to establish good standards in doping prevention and doping control. As president of the Swiss Antidoping Agency.

I am quite unhappy about a number of shortcomings of the current doping ruling of WADA (TUE too bureaucratic, Cannabis is not doping but is on the list, no clear guidelines as to infusions, etc etc). Moreover, the current people in power do not have good record for taking advice from those that do the job (National Antidoping Agencies) seriously.

So on a local level we continue to lose money and credibility by defending and adhering to a policy of an organisation that does not seem to be governed always by common sense. Having said this: WADA is needed and much of what was done was good and important. I can provide you with the official statement of our agency with regard to the perceived shortcomings of WADA in particular with regard to the next revision of the Standards. However, I would very much think that the UK-Agency probably has very similar complaints.

September 2006

Memorandum from Dr M J McNamee, University of Wales, Swansea

ETHICAL ISSUES REGARDING HUMAN ENHANCEMENT TECHNOLOGIES

1. INTRODUCTION

1.1 The most important role philosophy can play in debates such as exercise this Committee is in the clarity it may bring to the terrain of the dispute. While this cannot be done entirely neutrally, for the very framing of issues betrays ones predilections, it can be done with some objectivity, at least. It is clear that the excitement and enthusiasm that attends scientific and technological breakthroughs, such as we have seen over the last decade, in the field of biotechnology has led to many extreme and sometimes incautious claims. And to be sure there are many careers that are predicated on these projections. By contrast, I want cautiously to offer some clarificatory remarks on the conceptual parameters of this debate while making it clear that my own preference is marked by a precautionary attitude towards them.

2. ON THE IDEA OF ENHANCEMENT AND RELATED CONCEPTS

2.1 It is easy to slip into the conflation of the two concepts “modification” and “enhancement” yet critical that they are kept distinct for logical and practical reasons. Notwithstanding this, many advocates for the increasing application of what are called human enhancing technologies wish to bring these two ideas together. The increasing valorisation of autonomy as the chief ethical value in medicine (and beyond) has supported a supposition that any modification sought by an individual is thereby to be considered an enhancement by their own lights. At least one of its extremes is to be found in elective, non-therapeutic, amputation (see Elliot, 2003). Clearly this renders the concept of enhancement empty. When disputing matters of enhancement, criteria beyond mere individual choice must be borne in mind. We might benefit from considering the broader goals of sport and society (Parens, 1998) the narrower goals of biomedicine, (Jeungst, 1998) as well as the ethics of self-improvement (Jeungst, 1998) including the dignity of human activity (Kass *et al.*, 2005). By way of warning, Jeungst (1998) writes that “For policy makers faced with the prospect of using of enhancement as a regulatory concept it will be important to have a clear map of these uses and interpretations” (1998:29). It is clear that there is shared terrain here; instances where one point cuts across these domains of significance but it is also clear that the distinctions can direct us to where certain arguments best gain their purchase.

3. THE THERAPY—ENHANCEMENT DISTINCTION

3.1 One line of argument frequently suggested is that the therapy/enhancement distinction is blurred and, therefore, of no use in distinguishing permissible/desirable from impermissible/undesirable technological modifications (see, in relation to sports, Miah, 2004: 95). This argument is not as sound as it appears. The typical example given to undermine the absoluteness of the distinction is that of immunization where the levels of the immune system are boosted beyond normal functioning (itself a range, but typically used as a benchmark for biomedical accounts of health and the therapeutic ends of medicine). On such an account a body is diseased, ill or under some deleterious condition when it is functioning abnormally in relation to the class of species to which it belongs). But a distinction need not be exceptionless to be either useful or clear. The final end or purpose even of immunizing enhancement is one of prevention rather than enhancement *per se*. So despite the fact that an exception can be lodged on these grounds it does not follow that any and all other modifications which do not share the preventative goal are legitimized.

3.2 Moreover, Jeungst (1997: 129–30) identifies three examples, pertinent to our present concerns, where applying the label “enhancement” is unproblematic: “interventions which take place to the top of their personal potential (like athletic training) or beyond their own birth range (like growth hormone), or to the top of the range of the reference class, or to the top of the species-typical range, or beyond (!), are all to be counted as enhancements and fall successfully further beyond the domain or responsibility of medicine or health care.” It is the last point that is noteworthy here. Much of the discussion which attempts to support a more liberal approach to human enhancement technologies (both as in older attempts to liberalise steroids as much as new advocacy for genetic technologies) attempts to use the contested terrain between the two concepts to open the way to a more accepting approach of the new possibilities offered by technology whether in medicine (Resnik, 2000) or sport (eg Miah 2004; 2005, and Tamburrini, 2000; 2006). The central thrust of the challenge to that distinction concerns the identification of health care needs as distinct from other health-related desires in the face of health insurance schemes’ obligation in the relation to the former but not the latter (see Buchanan *et al.*, 2003). Or, as Jeungst (1998) puts it, the distinction can be used to define the limits of a physician’s obligations. At the risk of labouring the point, acceptance of this does not entail the denial of the utility of the distinction in relation to, for example, genetic enhancement of elite athletes.

4. WHAT FOLLOWS IF THE ATHLETE IS NOT A PATIENT?

4.1 One interesting development of this point presents itself in the idea that the athlete is not to be viewed under the aspect of “patient”. It is concluded from this that the athlete should not be “beholden to the same kinds of ethical distinction (sic) that exist within healthcare and medicine” (Miah 2004:96). This seems an important point which follows from the therapy-enhancement discussion.

4.2 There are three points to be made in response to this assertion. First, note that it is assumed that the distinction between therapy and enhancement because it arises in healthcare and medicine cannot meaningfully be applied beyond those spheres. No account is given why this should be the case. Secondly, no argument is given as to what would take the place of the distinction in helping us demarcate acceptable from unacceptable enhancement. Thirdly, the use of prosthetics in elite disability sport provides a challenging case for our presuppositions regarding the proper use of technology in Paralympic sport and by extension to Olympic sport also. While there was considerable disquiet in parts of the athletic community in the early 1990s when Carl Lewis had his shoe manufacturer ergonomically design his own specific sprinting shoe, there seems to be ready acceptance of individually designed prostheses in elite disability sport. This issue merits further exploration.

4.3 Three sorts of questions regarding the nature of excellent performance might profitably be raised here:

- (i) How desirable is the fact that excellent performance may be *dependent* upon the technology?;
- (ii) What further inequities are introduced by the new technologies at hand which will further exacerbate access to extremely unevenly distributed performance support and systems?; and
- (iii) Why should elite disability athletes not be seen under the double aspect of a patient *and* elite sportsperson?

4.4 It is far from obvious then why the distinction cannot be useful in both Olympic and Paralympic arenas. Indeed, the “therapeutic use exemption” by WADA is an attempt to recognise that athletes have basic healthcare needs as well as those less basic, instrumental, needs that attend them in virtue of their chosen sporting ends. Where an athlete has a healthcare need that cannot otherwise be attended to by methods that do not have a performance enhancing effect they may use therapies that co-incidentally enhance performance. Why, it has been often asked, so many elite athletes suffer from asthma and are in receipt of medication that has enhancing effects is something of a moot point. More generally, however, what they committee must be vigilant towards is the *excessive* technologization of performance in all sports while recognising the necessary role that technology plays in elite sports.

4.5 Perhaps the greatest challenge with respect to human enhancement technology is present in recent discussions of Transhumanism and the integration of technology and biology to transform and transcend human nature (McNamee, 2006; McNamee and Edwards, 2006). A few individuals are already experimenting with direct forms of human-computer interface. This is a serious challenge to the idea of humanness and species integrity. What ramifications this new Prometheism may have in the less Government-regulated sphere of elite sports, where boundary-testing may be the norm, is a worrying thought (McNamee, 2007a).

4.6 Of course discussions such as these cannot trade long on generalities. By contrast, they must proceed to the more precise terrain of why this or that enhancement should be considered a good or bad thing in relation to this or that sport or sportsperson. I shall remain, however, in my remarks here at a very general level.

5. THE GOALS OF SOCIETY AND THE GOALS OF SPORT

5.1 It is easy to be both sanctimonious and/or soporific about the values of and in sports. It should be clear that when we refer to elite sports we are not talking about the same social practice as Sunday morning football or midweek netball (or Friday night darts for that matter). Elite sports are Janus faced: they are simultaneously both play and display (McNamee, 1995). The internal satisfaction and external rewards are present from the beginnings of elite sport so that while the achievement of considerable esteem, glory, honour, and of course wealth has always attended elite sport it is nevertheless true these even goods are undermined when we consider unacceptable means brought to secure them. And it is undeniably true that we watch and admire elite sportspersons, canonically in the case of the Olympic games, for the excellence that the athletes embody or personify not merely what they do but that stand for or signify: commitment, channelled concentration, controlled aggression and power, courage in the face of suffering, dedication, strategic intensity, tenacity, and so on.

5.2 It has been argued (Tännsjö, 2000) that this admiration is fascistoid: that it necessarily entails our contempt for the herd. While this view has attracted much criticism (see for example: Persson, 2005) it points to an issue that is worthy of consideration. What is the basis of our admiration for Olympic athletes in the broadest sense, and how is technology implicated in that stance? There are, of course, many answers to this question and I propose to offer only two that are salient to the present discussion.

5.3 First, no one can doubt that Olympic athletes strive for excellence. They seek, in testing nerve and sinew, to perform to the limits of their potential and even to define the standards of excellence that others must achieve if they wish to achieve the glory, honour, fame (and in more limited cases than one may imagine) and significant wealth that attends to the achievement of excellence. The account of excellence has, however, to be one of both means and ends. Sports are partly defined by rules and rule-governed conduct which prescribes and proscribes both what is to count as success and how it may and may not be achieved. It follows from this that the means matter, logically and morally speaking. While technical means are sought for the most efficient securing of the ends of success, the very idea of “the most efficient means to the ends of sport” is ruled out by their very nature (Suits, 2005). The most certain way of scoring a knockout might appear to be to bring a machete into the boxing ring; the most secure way of scoring a goal may lead one to conceive of an apparently invincible tactic of carrying it over the goal line in an armoured vehicle. Of course these are proscribed by the rules (but not explicitly to the best of my knowledge) though perhaps more importantly, they simply would not count as a “knockout” or “goal” in the eyes of the relevant sporting communities, nor beyond.

5.4 Secondly, despite academic rejection of functionalist explanations of both religion and sport, it is undeniable that sports are modern morality plays (McNamee, 2007). The illiterate were taught Christianity in medieval Europe by these travelling theatres with their simplistic representations of God, good and evil, salvation and suffering. With the decline of organised religion as the dominant purveyor of moral norms in

society, sport is the most far reaching social practice through which standards of conduct and character are displayed, disputed, negotiated, supported, tested and, of course, undermined. Thus, even where flagrant cheating exists, or where gross egoism and greed are displayed, it cannot be denied that the practices of sport at least sustain these protean moral dialogues and at best give us pictures or role models of what we and others may aim at. It is undeniable that the spaces of sport serve moral and social goals beyond themselves.

5.5 In order to find support for a more sympathetic account of sport viz human enhancement technologies Miah (2004: 93) cites Jeungst (1998:40) to the effect that there is an ethical equivalence between the following options: creating new forms of athletic contexts or proscribing the use of technological enhancements. But this is not *exactly* what Jeungst (1998) argues for. It is both necessary and desirable to quote at length here for both precision and fairness of treatment. In his discussion of “enhancements as corrosive shortcuts” (1998: 39–41), Jeungst argues that some “biomedical enhancements unlike achievements, are a form of cheating. This view assumes that taking the biomedical shortcut somehow cheats or undercuts the specific social practices that would make analogous human achievement valuable in the first place. (. . .) If we are to preserve the value of the social practices we count as ‘enhancing,’ it may be in society’s interest to impose a means-limit on biomedical enhancement efforts.” Jeungst is properly careful here not to write off technological enhancement wholesale. Rather his concern is with social practices (such as education or sport) where the idea of achievement may be undermined or redefined by technology. With respect to attention-enhancing medication/technological products such as Ritalin, we can ask whether the enhanced performances it may bring draw in their wake contempt rather than admiration; whether the achieved grade properly marks the committed and disciplined study is designed to. He concludes that “If the grade is not serving that function then, for that student, it is a hollow accomplishment, without the intrinsic value it would otherwise have” (ibid.).

5.6 One of the pre-eminent functions of sports institutions (such as the IOC, WADA, or indeed the National Governing Bodies such as the Football Association) is the preservation of the intimate relation between achievement and the admirable qualities that sports are supposed to foster and reward. The idea of a corrosive shortcut enabled by morally problematic means may apply in many cases. But it does not exhaust a concern with the permissive application of technology. For athletes, even in the bad old days of steroid abuse, often took these drugs to train more intensely and recover more quickly from training and performance in order to excel. Thus when Jeungst (1998: 40) writes “Either the institutions must redesign the game (eg education or sports) to find new ways to evaluate excellence that are not afforded by available enhancements, or they must prohibit the use of enhancing shortcuts.” we must be clear that an entirely new catalogue of virtue and vice will have to be developed or a complete re-visioning of sports themselves in line with proposed technology. If such technology is accepted in the new definition of achievement then we will be left wondering whether it is really value neutral (as many have claimed) or rather pre-coded to transmit the values of those who have vested interests in promulgating technological conceptions of (the good) life itself. Whether what is left is recognisably human is itself a moot point.

6. REGULATION AND THE MYTH OF SISYPHUS

6.1 It might seem reasonable to think that the guardians of sport are involved in a struggle akin to the punishment the Gods gave Sisyphus (except that no one is claiming they committed a heinous crime). Sisyphus is condemned to roll a great rock up a hill only for it to fall down the other side as soon as he gets to the top of the hill. His strength sapping suffering thus is endless. And so it seems is the case for those who would be vigilant against the technological diminution of sports as human achievements. No sooner have they detected one corruption or usurpation than another occurs. This tragic context does not render the attempts of those who wish to preserve what is best in sport futile. Rather it enables a clear sighted vision of what is worth holding on to by careful argument and negotiation.

6.2 By way of conclusion, and following loosely from the foregoing discussion, I offer below some questions as indicative of criteria by which we might begin to evaluate the would-be human enhancing technologies in their application to elite sports:

- I. To what extent do the proposed technologies enhance or diminish our admiration for human athletic achievement?
- II. What harms do the enhancement technologies introduce or exacerbate?
- III. Is there unfairness of access to the technologies necessary for given enhancements?
- IV. Are the enhancements coercive or paternalistic?
- V. If public monies are used to support and maintain elite athletic performance will this represent a waste of scarce resources?
- VI. In line with whose ideals and interests are athletes being technologically “enhanced” or technologically “enhancing” themselves?
- VII. Will species integrity be undermined by the proposed technological “enhancements”?

6.3 These questions are tentatively suggested as dimensions that can help think through the desirability or permissibility of human enhancement technologies in elite sport. Clearly what is needed is a more nuanced, sport-by-sport analysis of the issues alongside critical reflections of policy makers, sports institutions and representatives of performers, tested out in arenas of public opinion supported, wherever possible by clear arguments in the public domain.

October 2006

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BIOGRAPHICAL NOTE

Mike McNamee is the inaugural Chair of the British Philosophy of Sport Association (<http://www.philosophyofsport.org.uk/>) since 2002, and a former President of the International Association for the Philosophy of Sport (<http://www.iaps.paisley.ac.uk/index.html>).

He was co-editor of the first international collection on *Ethics and Sport* (1998: Routledge) and co-edits the 12 volume book series of the same title from which that book sprang (http://www.routledge.com/Sport/series_list.asp?series=1).

He is Editor of the new international journal *Sport, Ethics and Philosophy* (Routledge).

Supplementary evidence from Dr Arne Ljungqvist, Chairman of International Olympic Committee (IOC) Medical Commission and Chairman of the World Anti-Doping Authority (WADA) Medical Research Committee

This is to express my sincere thanks to the Committee for having invited me to the hearing on the 29 November 2006. I hope that the answers I gave to the questions that were raised by the Committee members will prove valuable in the Committee's future work on the doping problem.

During the hearing, and after, I was asked to provide the Committee with further material as follows:

1. An English version of the Swedish anti-doping law, if available, and
2. Documentation in support of my statement during the hearing that "there is no reason to believe that so called gene doping will be undetectable—it is rather a question of how and when such detection will be made possible".

With respect to request 1 above I attach a summary in English of the Swedish Anti-Doping Law, implemented as from 1 April 1992 and later amended (Annex A). May I take the opportunity to clarify one matter, particularly after having read a report from the hearing in *The Guardian* on 30 November. The journalist had jumped to conclusions that I never suggested, and I am anxious that my statement was not misinterpreted by the members of the Committee.

Thus, I did not recommend that a possible future UK Law on Doping should include the automatic provision of prosecuting athletes who have been found positive at doping controls. During the hearing I simply reported what is prohibited under the Swedish law, namely the possession, trafficking, distribution and consumption of certain (serious) doping substances. I also emphasized that the vast majority of consumers of such substances in our country are not associated with sport. I was not asked how the Swedish law is, in fact, operating. Let me therefore explain that our legal community respects the sanctions that sports authorities impose on athletes found guilty of a doping offence and regards those sanctions as sufficient. Normally, therefore, no further prosecution of such an athlete will take place under the Swedish law unless there is suspicion that the athlete is in possession of larger amounts of doping substances than those compatible with "personal use" only and/or is a dealer in doping substances. That is in agreement with the position taken by the International Olympic Committee.

With respect to request 2 above I attach the statement that was agreed upon by the participants at the 2nd WADA Gene Doping Symposium, which took place in Stockholm in December 2005 (www.wada-ama.org/en/dynamic.ch2?pageCategory.id=530). I believe that point 5 of the statement is of particular interest. The participation at the symposium was restricted to some 40 specially invited scientists from all over the world and known as leading international scientists in genetics, gene transfer technology, gene therapy and medical ethics. Also scientists from UK did participate including Geoffrey Goldspink, professor of anatomy in London. He should be in position to further elucidate the aspect of the detection of gene doping.

As I mentioned during the hearing, my WADA Committee (Health, Medical & Research Committee) has a "Gene Doping Panel" chaired by Professor Ted Friedman from University of California, San Diego. He is the incoming President of the American Society of Gene Therapy and generally regarded as "the father of gene therapy". In issue No 1, 2005 of the WADA magazine named "Play True" Professor Friedman has given an interview, which further supports my statement given at the hearing. Thus, in response to the question "*Can gene doping be detected?*" Professor Friedman states as follows: "*I think there is a very good chance that scientists will discover techniques for detecting gene doping. There are many avenues of research to pursue. Those who will try it, thinking it is undetectable, will be in for quite a surprise.*"

December 2006

Annex A

MINISTRY OF JUSTICE, STOCKHOLM, SWEDEN

THE SWEDISH ACT PROHIBITING CERTAIN DOPING SUBSTANCES (1991:1969)

Section 1 This Act applies to:

- (a) synthetic anabolic steroids,
- (b) testosterone and its derivatives,
- (c) growth hormones,
- (d) chemical substances that increase the production and release of testosterone and its derivatives or of growth hormones.

Section 2 Other than for medicinal or scientific purposes, the substances specified in Section 1 may not be:

1. imported into the country,
2. transferred,
3. produced,

4. acquired for the purpose of transfer,
5. offered for sale,
6. possessed, or
7. used.

The Act (1999:44).

Section 3 Any person who intentionally violates Section 2, subsections 2–7 shall be sentenced for a doping offence to imprisonment for at most two years.

If, in view of the quantity of doping substances concerned and other circumstances, the offence referred to in paragraph one is regarded as petty, a fine or imprisonment for at most six months shall be imposed.

Concerning the penalty for unlawful importation, etc, the provisions of the Smuggling of goods (penalties) Act, (2000:1245) apply. The Act (2000:1245).

Section 3a If an offence referred to in Section 3, paragraph one, is considered to be grave, imprisonment for at least six months and at most four years shall be imposed for a grave doping offence. In judging the gravity of the offence, special consideration shall be given to whether or not it was part of large-scale or professional operations, involved a particularly large quantity of doping substances or was otherwise of a particularly dangerous or ruthless nature. The Act (1999:44).

Section 4 An attempt or preparation to commit a doping offence not considered to be petty shall be sentenced in accordance with Chapter 23 of the Penal Code provided the criminal act was of a nature other than that referred to in Section 2, subsection 6 or 7.

If several people have taken part in an offence referred to in Section 2, subsections 2–5, Chapter 23, Sections 4 and 5 of the Penal Code shall apply. The Act (1999:44).

Section 5 Substances that have been the object of crime under this Act or the value thereof and the proceeds of such crime shall be declared forfeit, unless this would be manifestly unreasonable. The same applies to an advance for such a crime or its value provided the advance has been received and its receipt is an offence under this Act.

Property that has been used as an aid to crime under this Act or the value of the property may be declared forfeit if this is essential for the prevention of crime or there are other special reasons. The same applies to property which has been handled in a manner constituting an offence under this Act.

Section 6 Concerning seizure of property to be forfeited in accordance with Section 5, the provisions of the Code of Judicial Procedure apply.

The provisions set out in Section 2, subsections 1 and 3 of the Act on the Forfeiture of Alcoholic Beverages, etc (1958:205) shall apply in corresponding fashion when seizure of the substances referred to in Section 1 of this Act takes place. However, the period of notification of dissatisfaction shall be counted from the date of the order. The Act (1994:1426).

REFERENCE:

Swedish Code of Statutes no: 1991:1969.

Title: Act prohibiting certain doping substances (1991:1969).

Issued: 19 December 1991.

With amendments: up to and including Swedish Code of Statutes 2000:1245.

Memorandum from Zef Eisenberg, sports nutrition expert

RE: THE USE OF SPORTS NUTRITION FOR HUMAN PERFORMANCE ENHANCEMENT: POTENTIAL IMPACT ON THE 2012 OLYMPICS

The science select committee have heard opinions from a variety of issues relating to sports nutrition and exercise performance, however many key issues have not been accurately reported or have been totally overlooked.

A great deal of emphasis has been placed on the work of Hans Geyer, relating to the supposed incidence of contamination in UK sports supplements. He reported that close to 20% of dietary supplements (not just sports supplements) were contaminated with anabolic steroids. Furthermore he also proposed that 5% of dietary supplements contained prohormones that would result in athletes testing positive for nandrolone.

Although the study of Geyer *et al* 2004 was published in 2004 it actually related to supplements that were bought and analysed for steroid contaminants between 2000 and 2001. At this time the inclusion of prohormones in supplements was legal both in the UK and the US and there was potential for cross contamination of dietary supplements.

Legislative changes removed prohormones from the dietary supplement market first in the UK on 1 January 2004 and on 1 January 2005 in the US. This greatly reduced the risk of inadvertent contamination of dietary supplements with prohormones. Furthermore the number of companies employing good manufacturing practices (which further reduces the risk of inadvertent supplement contamination) has greatly increased.

For these reasons the work of Geyer *et al* 2004 does not now reflect the UK industry. This is highlighted by the work of the worlds leading WADA accredited labs HFL, based in Newmarket UK.

Between 2002 and 2006 HFL have performed more than 1,500 ISO17025 (and UKAS approved) tests on sports supplements to assess possible contamination with a range of stimulants and steroids that are banned under WADA rules, including 19-Nor, the only prohormone found to convert into Nandrolone. HFL found less than 1% of supplements were found to contain any traces of contamination, which is 20 times lower than reported by Geyer in 2004. Furthermore, the products that tested positive were not released onto the market, as was the purpose of the test.

It is clear to say that if UK athletes choose UK sports nutrition brands from reputable companies that pre-screen their products with HFL, you will find that the actual level of contamination found in these products is 0%. The list of products that I am currently aware of that test each and every batch are Maximuscle, EAS and Lucozade. Clearly there are major inconsistencies with the work of Geyer and the actual level of contamination in UK supplements.

Assessment of the number of athletes who drug test positive for nandrolone provides another good way to assess the level of contamination in UK sports nutrition products. Assessment of dietary practices by athletes show that 80% of athletes will take dietary supplements such as carbohydrate electrolyte drinks, multivitamins or recovery products. Based on the work of Geyer it would be anticipated that around 4% of UK athletes would have tested positive for nandrolone between 2000 and 2001. However, UK Sport publishes the results of WADA tests on its website and these include the compound or compounds that resulted in the positive test. For the period 2000 to 2001 around 0.1% of drug tests were positive for nandrolone, even taking into account the timing of urine sampling relative to supplement ingestion this result is not consistent with the figures reported by Geyer *et al* 2004.

This finding is even more remarkable when considering that some athletes deliberately try to cheat by taking prohormone products during training or pre-event preparation. Finally it is important to recognise that athletes use more than one product eg creatine, multivitamins, carbohydrate electrolyte drinks, supposedly producing an additive risk of athletes testing positive for nandrolone, Clearly there is a disparity between the reported incidence and severity of supplement contamination and the actual level of contamination and one can only conclude that Geyer's results are not an accurate reflection of contamination of UK supplements. Unfortunately, this issue has not been addressed or recognised by the people invited to provide evidence and although this information has been available to them, it is still ignored in favour of an outdated study which clearly contains many flaws.

As someone clearly passionate about sport, if we are to achieve the level of success we desire in the 2012 Olympics, the people or bodies involved in helping athletes achieve their full potential, must be aware of the benefits of sports nutrition and the brands which are safe to use and are supported and backed by credible peer reviewed science.

December 2006

Supplementary memorandum from the Department for Culture, Media and Sport

Thank you for giving me the opportunity to give evidence to your Committee on Tuesday. Your Committee's Inquiry will help strengthen and improve our anti-doping programme, in this country and beyond, and I am grateful to you for that.

As I said to the Committee, this is all the more important at the moment given the current review of the World Anti-Doping Code. I hope that the recommendations in your final report will help to shape the new World Anti-Doping Code, to be agreed at the World Conference on Doping in Sport in Madrid in November next year.

I also wanted to take this opportunity to draw your attention to UK Sport's plans on the issue of research, about which I did not have time to talk through in detail during the session.

UK Sport has been working closely in recent months with the research community to take forward its plans for a comprehensive research and development programme for high performance sport. These discussions are continuing but we have already seen some impressive results. For example, UK Sport has teamed up with the Engineering and Physical Sciences Research Council to seek out some of the brightest research talent in the quest to win medals In London 2012. Together, they held three "Achieving Gold" workshops with some of the best researchers from a variety of backgrounds to look at the application of science, engineering and technology to Olympic and Paralympic performance sport.

We also want to see the commercial sector get involved in this important area of work. UK Sport is developing its links in this area, and I am committed to doing what I can to support them. That's why I am planning to convene a meeting in the new year with Qinetiq and BAE Systems to discuss how the best of British expertise in engineering and technology could be applied to benefit high performance sport.

In addition UK Sport is in the process of establishing an anti-doping Research Steering Committee, made up of academics and practitioners from sport education and medical science to advise on and co-ordinate, research in the UK. As a minimum, I would hope that this Committee will be able to draw together research taking place across the UK to ensure that UK Sport and other sporting organisations have access to the latest cutting-edge research.

Turning to another matter, the Committee was interested in the "conflict of interest" question between the anti-doping and performance sport function in UK Sport. I mentioned the independent PMP Report carried out in 2004 which found no evidence of this and which was corroborated by the Culture, Media and Sport Select Committee hearing into Drugs and Role Models later that year.

In implementing recommendations from the PMP Report UK Sport established an Independent Scrutiny Panel in September 2005, whose remit is to scrutinise the anti-doping function within UK Sport to identify actual or potential conflicts of interest.

I am pleased to inform you that the Panel published its first annual report on 15 December on UK Sports website, and I enclose a copy with this letter (not published). I am also pleased that no obvious conflicts of interest have been identified in its first year, and that in setting out its work plan for 2006–07 the Panel has made clear it will take account of the *perception* of a conflict of interest when making any future recommendations.

December 2006

Supplementary evidence from UK Sport following the evidence session on 19 July 2006

RESPONSE TO ADDITIONAL SELECT COMMITTEE QUESTIONS REGARDING THE HET INQUIRY

Following the evidence session on Human Enhancement Technologies in Sport on the 19 July, UK Sport and DCMS agreed to answer some additional questions posed by the Committee.

1. *What scope do you have for ensuring compliance of National Governing Sporting bodies with the UK Sport testing and/or education programmes?*

Compliance with WADC

To monitor National Governing Body (NGB) compliance UK Sport undertakes the following:

Anti-Doping Agreement

Each NGB is required to sign the tripartite Anti-Doping Agreement between UK Sport, Home Country Sports Councils (HCSC) and the relevant NGB.

All Sports must sign this Anti-Doping Agreement in order to be eligible for public funding. The Agreement stipulates that it is the responsibility of the sport to support the fight against doping in sport.

In addition, the following important elements are included:

- The NGB shall recognise UK Sport as the National Anti-Doping Organisation (as that term is used in the Code) for the United Kingdom and shall fully support the efforts of UK Sport and HCSC in the fight against doping in sport.
- NGB shall adopt, bring into force and implement without material change, as part of its own antidoping rules the mandatory parts of the UK Sport Model Rules to ensure compliance with the WADC.
- To demonstrate compliance with its obligations, all NGBs shall provide a complete copy of their NGB Anti-Doping Rules as updated from time to time.
- Affirmative obligation to confirm periodically to UK Sport that they have met all of their obligations under the agreement, not only in adopting anti-doping rules but in implementing them.

Review and Confirmation of Compliance

All anti-doping rules are then subject to a review by external legal advice if there are any material departures from the mandatory elements of the Code.

Annual compliance check

On an annual basis at a minimum, or as and when updated, NGBs are asked to submit the most current anti-doping regulations to allow UK Sport to monitor compliance with the model rules and the Code.

Compliance with Education requirements

Annually NGBs on the anti-doping programme are required to submit a registration form detailing their plans for education for the following year. This is reviewed by the Education team and monitored throughout the year. In November 2006 UK Sport will launch an online Education Model Guidelines to enable NGBs to develop their own detailed education strategy for anti-doping education.

2. *What formal and informal links do you have with additional stakeholders (eg the British Olympic Association, the British Paralympic Association, the English Institute of Sport and consultants such as "Coachwise"). How do you prevent duplication of effort, for example in education programmes? What efforts are made to share best practice between UK Sport and other stakeholders?*

UK Sport maintains many formal and informal relationships with partner sports organisations in the UK. We have outlined these below:

British Olympic Association: "UK Sport and the BOA maintain a close working relationship based on the complementary objective for Olympic success. UK Sport delivers anti-doping education and information to members of the Olympic team on a quadrennial basis and the BOA fully cooperates with UK Sport's pre-Games testing programme to provide final team lists and location details of all training camps leading up to the Games.

British Paralympic Association: As the British Paralympic Association receive core funding for their programme, they are required to sign both a funding agreement and the Anti-Doping Agreement as with NGBs. They therefore have a contractual relationship with UK Sport to comply with the mandatory elements of the Code. UK Sport delivers anti-doping education and information to members of the Paralympic team on a quadrennial basis and the BPA fully cooperates with UK Sport's pre-Games testing programme to provide final team lists and location details of all training camps leading up to the Games.

English Institute of Sport: On 1 April 2006 UK Sport assumed full responsibility for all Olympic and Paralympic performance related support in England, from the identification of talent, right the way through to performing at the top level. The transfer of responsibilities from Sport England to UK Sport means that the work of the English Institute of Sport is now directed by UK Sport.

All Home Country Sports Councils (Sport England/Sport Scotland/Sports Council for NI/Sports Council for Wales): All Home Country Sports Councils (HCSC) have adopted the UK National Anti-Doping Policy and recognise UK Sport as the National Anti-Doping Organisation and lead agency on anti-doping matters. UK Sport and the HCSC sign the tripartite Anti-Doping Agreement to confirm the joint commitment to anti-doping. As part of that commitment, HCSCs agree to:

- Support UK Sport in its role as National Anti-Doping Organisation with primary responsibility for anti-doping matters in the United Kingdom.
- Subject to continued compliance by NGB it is the responsibility of the HCSC through the A-D agreement to confirm that an NGB has satisfied all of the anti-doping requirements for eligibility to receive recognition.

The UK Coordinating Group on Anti-Doping meet regularly to discuss anti-doping issues including: NGB Compliance, Testing Programmes, Education and Policy.

Youth Sport Trust: Although our relationship is informal, we have very strong ties with the Youth Sport Trust and work closely with them on a number of initiatives, with particular attention to education. Some examples of this are:

- Ongoing involvement in the delivery of anti-doping education to participants in the UK School Games through the 100% ME programme.
- Education initiatives for youth athletes and school-age to achieve consistency in messages about positive lifestyles.
- Sport Leaders and 2012 Ambassadors as potential 100% ME Ambassadors.

General partnerships

In addition to these partnerships, the 100% ME Accreditation programme aims to ensure consistent and accurate messages are being delivered to athletes and support personnel through various programmes. Below are some examples of where we have trained and accredited over 225 tutors and 100 advisers to deliver the 100% ME message:

- Practitioner Development Programme, UK Sport.
- Elite Coach Programme, UK Sport.
- EIS, SIS, WIS, NIIS and all HCSCs.
- Talented Athlete Scholarship Scheme mentors.
- Rugby Football Union (all academies).
- Rugby Football League (all Super League and National League clubs).
- Representatives in over 35 sports across the UK.
- DCMS.
- Youth Sport Trust.
- British Athlete Commission.
- DARE UK.

3. *What steps do you take to compare the test results of UK athletes with those from other countries?*

At present, WADA provide data in their annual reports relating to the out of competition testing figures and adverse analytical findings from all anti-doping organisations. While we use this information to inform our information programme and to make general comparisons to help measure the effectiveness of our system, we do not make regular strategic comparisons. We will continue to rely on WADA for this information as they act as the clearing house for all test results. As the ADAMS database is implemented across countries, we do anticipate that this information will advance and provide some useful statistics for our doping control programme. You can download the WADA Annual Report for 2005 here:

http://www.wada-ama.org/rtecontent/document/2005_Annual_Report_En.pdf

4. *How much money has UK Sport/DCMS spent on research into human enhancement technologies? What levels of research funding can we expect to see from UK Sport in the future and what will such funding be used to support?*

From an anti-doping perspective, UK Sport does not have responsibility for funding research but instead hopes to enhance its role in influencing the research agenda more widely in this area. It is fundamental that anti-doping efforts are global in their approach due to the complexity of the anti-doping issue. UK Sport fully endorses the importance of international cooperation and we continue to fully support WADA in taking the lead and increasing its research budget.

In our Performance team, we will be investing up to £1.5 million per year in sports science and sports technology research to support priority projects with our leading sports that can provide British athletes with a competitive advantage within the rules of sport. It should be noted that many of these will remain confidential so not to compromise knowledge gains that can be of value to British sport. Current discussions with research councils are premature although we have recently been working closely with EPSRC who have released a call for research in some particular areas of priority for us. See link below.

<http://www.epsrc.ac.uk/CallsForProposals/OlympicAchievingGoldWorkshopsCallForParticipants.htm>

Similarly DCMS does not have a budget for funding research but works, as mentioned above, to foster international cooperation in supporting WADA through mechanisms such as the UK's membership on the Council of Europe, and through ratification of the UNESCO Convention.

5. *How do you promote use of legal performance enhancing measures in sport?*

UK Sport values the contribution that sport can make to health, national pride and social development when fostered within a strong ethical environment. UK Sport also identifies integrity, fairness, equity and respect as values essential to success in sport. Fundamental to sport being enjoyed by all is sporting conduct and the way sport is played. As an organisation we are fully committed to playing our part in ensuring that standards are set for fair play and doping-free sport and then promoted through the provision of effective education and information.

We understand the realities of high performance sport and will always explore new and innovative ways to train and compete within the rules of sport. Athletes will continue to push themselves to the very limit of their abilities and we aim to ensure that British athletes do this fairly and cleanly. As a result, this at times requires UK Sport to provide advice to athletes that will allow them to make informed choices. For example, our recent publication entitled "Sports Supplements and their Associated Risks" provides information that

helps the sporting community better understand the risks associated with supplements use and to assist athletes in making informed choices about their dietary needs. While no guarantee is given about the safety of any supplement, the emphasis of this resource is to manage the risk and minimise the threat of committing a doping violation through taking a contaminated supplement. In addition to this responsibility to provide expert advice to athletes, UK Sport maintains that athletes should always seek guidance from a qualified medical professional before making any decisions about the use of medications or supplements.

6. *[In reference to Q98 on the session transcript] What type of information is routinely received from the WADA listing Committee? What other mechanisms exist for receiving information from WADA?*

We assume here that you mean the WADA Prohibited List Committee and have provided a response based on this assumption. Please contact me if you require more information.

The issues discussed by the WADA Prohibited List Committee are not shared with key stakeholders and Signatories on a regular basis and the outcome of their considerations are evident in the draft of the Prohibited List that is circulated annually in July.

We regularly consult with WADA's Scientific and Medical Directors on prohibited substances and methods, and often seek clarification from them about the status of substances and methods to which they satisfy our requirements in this respect.

WADA produces an annual report that provides details of the work of the Agency, financial statements, testing statistics and general updates.

UK Sport attends relevant international meetings hosted by WADA where information is shared about enhancing anti-doping efforts.

John Scott, is a executive member of the Association of National Anti-Doping Organisations and receives information from WADA via this avenue regarding policy and the Code. Allison Holloway is the Chair of the Council of Europe Advisory Group on Education and liaises with WADA regarding Education matters on behalf of the member states of the Council of Europe.

UK Sport is very much at the forefront of the international fight against doping in sport and we are in an excellent position to receive information and help influence policy and procedures.

DCMS receives papers circulated to the WADA Foundation Board and Executive Committee members via European Public Authority representation on these boards. To illustrate, as the Danish Minister of Sports, Mr Brian Mikkelsen is the current WADA Vice-Chair, information is circulated to European governments via the Sports Department of the Danish Ministry for Sport.

7. *[In reference to Q102 on the session transcript] Please provide information on the UK Sport Research Group. When was this group established and who sits on it? What activities has this group undertaken? What does the research group hope to achieve in the future? Please also provide additional information on your general plans with respect to human enhancement technologies in sport.*

UK Sport plans to establish a Research Steering Group in 2006–07 with the purpose of identifying past, current and future anti-doping research in order to help the Drug-Free Sport Directorate establish an ongoing strategy for their contribution to anti-doping related research and development.

In its first year, the RSG will aim to achieve the following objectives:

- To complete an audit of all relevant research conducted globally in the past, currently being conducted and any known planned research in the area of doping in sport;
- To identify the areas of social and scientific research in which UK Sport could make a valuable contribution; and
- To establish areas of work for PhD and Masters students where it is believed they could make an important contribution to anti-doping related research and development.

Members will be selected by UK Sport based on their experience in the field of research and their understanding or affiliation with anti-doping activities.

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