British Association of Sport and Medicine
North East England World Cup Conference
Territorial Army Centre, West Hartlepool,

7th July, 1966

Report by Dr. M. J. Keating

AGENDA

6.30 p.m. Reception by His Worship the Mayor of West Hartlepool, Alderman G. W. Groves J. P.

7.00 p.m. Formal Opening of Conference by the Mayor.

7.10 p.m. Introduction of Conference business by the Chairman, Dr. M. J. Keating.

7.15 p.m. Paper - "Neurological, Physiological and Psychological Aspects of Football" by Dr. J. R. Foster, M.D., M.R.C.P. followed by discussion.

INTERVAL

8.30 p.m. SOME ASPECTS OF FOOTBALL INJURIES - introduced by the Chairman.

(1) "The Footballers Knee" Mr. David Brown, M.ch. Orth., F.R.C.S.

(2) "Muscle Injuries in the Footballer" Dr. Neil Phillips.

(3) "Rehabilitation of the Footballer after Injury" Dr. J. M. Scott, F.R.C.S. (G).

(4) Open Forum
INTRODUCTION

The North East of England area of the B. A. S. M. held a Conference in connection with the World Cup Competition in West Hartlepool on 7th July, 1966. It was well attended by representatives from overseas as well as from most clubs and educational bodies, and a good cross section of the local Medical Profession. The Conference was preceded by a Civic Reception given by the Mayor of West Hartlepool, Alderman G. W. Groves, J. P., supported by many members of the Town Council. The Mayor, subsequently, formally opened the Conference and welcomed the many visitors present.

The Conference Chairman, Dr. M. J. Keating, thanked the Mayor for his interest and support and his magnificent and generous hospitality, and also thanked Mr. D. H. Williams, Director of Physical Education and his staff, without whose unstinted help and advice the Conference would not be possible.

The Chairman then briefly outlined the objects of the Association and invited application for membership from anyone present who was interested.

Papers as per attached Agenda were then read and discussed.
Dr. J. B. Foster

Dr. Foster began his lecture by speaking about the origins of football. He then went on to describe, in detail, how a player was able to kick or throw a ball and the physiological mechanisms involved. He spoke about the impulse being conducted by the nerves to the motor end plates and thus to the muscle fibres enabling the muscle to act smoothly and in a co-ordinated manner. Was the form of energy, transmitted to the ball, ballistic force? i.e. the initiation of muscle movement which gives momentum to the limb to swing through, or was it the force of muscle contraction which directly transmitted energy to the ball? - It is believed in actual fact that both forms of transmitting energy play a part.

Dr. Foster went on to explain how both isotonic and isometric contractions were used by the player. Muscle structure was described and also the method of contracting within the fibres. Referring to the work of Sherrington, he explained that a muscle only contracts when stimulated through a nerve. However, the whole nerve in man, under physiological conditions, never stimulates the whole muscle to move, in fact the muscle fibres are stimulated one after the other to produce a smooth movement. There is a safety mechanism which prevents over-contraction of the muscle - this is known as the "gamma" system, which is responsible for muscle tonus.

He then explained the functions of the "upstairs parts" of the central nervous system - cerebral hemispheres, brain stem and hind brain - where thousands of millions of cells are deciding how to put the final pathways referred to above into activity. He referred to the importance of the reticular formation (so-called) in the brain stem which alerts us to activity. The normal cerebellum controls in some way, co-ordination of voluntary movement as disease or injury, it causes gross in-co-ordination - it also probably controls the "gamma system" already referred to.

The parietal lobes are most important to the sportsman - if this area of the brain is damaged, movements are in-co-ordinated as all sensory impulses come to this part of the brain to be co-ordinated and summated so enabling a player to be aware of where he is in relationship to his surroundings. Information to a soccer player from this part of the brain enables the player to position himself correctly to receive the ball with either his foot or head.
Dr. Foster then explained in detail the Neuro Physiological basis of right handedness and left handedness and suggested that the exploitation of this knowledge should contribute much to the player's efficiency. He explained Pavlov's work on conditional reflexes and expressed the opinion that much of the footballer's skill depended on such reflexes - i.e. repetitive practice.

The most successful footballers enjoy the game; they are ambitious and of course, in the case of the Professional, there is also financial inducement to the player to give of his best.

Keeness, however, sometimes causes stress which could affect the efficiency of the player. Under increasing stress a player performs better - up to a certain point. Consciousness then obtrudes on what, to the player, have become conditioned responses so that he may become less efficient and he finds he is "off his game" in a big match. Stress has brought him to a certain peak and he is performing at his best - above that he becomes so stressed and conscious of what is happening that his imagination begins to play on what is normally an automatic response and he may "fluff" a shot at goal or, in the case of a goalkeeper, go the wrong way. The more imaginative the player (not necessarily the more intelligent as this does not always follows) the sooner will this point be reached at a time of stress.

The ideal footballer basically must have the required anatomical and physiological make-up. He must be quick acting and effective with above average co-ordination. He must have an almost unique appreciation of what is extra-personal space which underlines the importance of the parietal lobe. A player must know the limits of the pitch so that he knows just how hard to kick the ball for it to go say 50 yards, to a man running into an open space. So whatever is going on in the parietal lobe is a most important factor in the whole of a player's interpretation of his skill as a footballer.

In the British Medical Bulletin, James Gray states that it would be interesting to know how much the difference between the expert and the indifferent athlete depended on the possession of more powerful muscle and how far on the conscious or unconscious ability to move his muscle to best advantage. I think that the latter coupled with not too much imagination at conscious level makes a better player.

Few footballers are injured in a neurological way - a small percentage may have an occasional subdural haemotoma through heading the ball. Injuries of the cervical spine are more common but few are too serious. However, in a supposedly non-contact game, players are prone to disabling
injuries e.g. broken legs.

Dr. Foster ended his discourse on a lighter note by wondering why it was so prevalent in soccer players to express their joy in scoring a goal by hugging and kissing each other as this is the only game where this takes place.

**Dr. M.J. Keating**

In introducing the second half of the Conference, the Chairman indicated the difference between injuries due to direct violence and those due to indirect violence. As far as prevention of injury in footballers was concerned, he said that he thought the most important factors were:

(a) The skill of the player himself
(b) The overall physical fitness of the player
(c) Pre-match and pre-training warming-up

Mr. David Brown explained the anatomy of the knee joints in simple terms. He then reviewed the injuries and other disorders to which the knee joint is subject at various age groups. He spoke of the incidence and treatment of congental discoid external cartilage in young children and stated that once the diagnosis was firmly established the offending cartilage should be removed.

In the older children, in the 10 to 14 year age group, various types of osteochondritis were the common problems. He explained the nature of these disorders in detail and included a description of the various types of lesions encountered - particularly Asgood Schlatters disease of the tibial tubercle, osteochondritis of the medial femoral condyle and chondro malacia patellae. He pointed out that it is very important to diagnose these disorders early in their course so that the appropriate surgical treatment could be performed before loose body formation in the joint causes further and often extensive damage in the joint.

Getting on to the more mature footballer, the two most important injuries encountered were tearing or rupture of the medial ligament and tearing or displacement of the medial and lateral cartilages. Mr. Brown emphasised the importance of accurate diagnosis and described in detail, the various methods - manipulative and otherwise - by which this was achieved. He explained the mechanisms of locking and unlocking of the knee joint and gave a practical demonstration to illustrate the various manoeuvres involved in the unlocking of the locked knee and the diagnosis of the torn cartilage.
Dr. Neil Phillips

This was a lecture illustrated by slides which were magnificent in quality and skilfully arranged so that the lecture was visual rather than oral. Even so, the oral content of the lecture was splendidly clear. Dr. Phillips dealt at length with the most common injury in the footballer, that of the "pulled" muscle. When this injury occurs, the muscle fibres are not only torn but so is connective tissue and most important of all, blood vessels. It is the associated haemorrhage which causes anxiety to the physiotherapist and the doctor. The treatment can be divided into three main phases.

The first phase takes place as soon after the injury as possible. The more immediate the treatment can follow the injury the better chance of arresting the haemorrhage. The treatment consists of pressure on the injury site, and elevation of the limb.

The second phase of treatment is the dispersal of the haemorrhage by the application of heat and by the use of static muscular contractions.

The third phase is the restoration of muscle strength and the return of the footballer to his normal activities. The third phase can often overlap the second. Slides were then used to show these sequences being applied by Dr. Phillips on players in a professional club.

The first slides showed a Robert Jones pressure bandage being applied to a patient. The patient being then transported home and confined to the home and visited regularly during the next 24 hours. An illustration was then given to show what happened when treatment was not so prompt and professional. The injury was a haemorrhage into the vastus externus of an amateur player which had swelled to a distressing point because treatment had not been attempted for three days after the injury.

The next phase, was slides showing the dispersal of whatever haemorrhage which had occurred by the use of various forms of heat treatment and the various types of static, non-weight bearing exercises which were employed. This was followed by weight-bearing exercises, strictly controlled in resistance to restore strength to the damaged muscle. At this point the player was allowed to join in light training and eventually to come on to training with a ball. It was here, very often, that one could notice how a player showed a reluctance to stretch the damaged muscle and he tried to overcome this by masking movements which thus hindered his normal game. To offset this for the last four years, Dr. Phillips had been working on a system of applied graduated stretch exercises which gradually bring the stretch into twisting movements and thus reassure the player that he is
able to carry on a normal game. If he was not ready a moderate reaction occurred thus indicating that he was not fully recovered and serious breakdown and re-occurrence of his old injury could thus be prevented.

Dr. J.M. Scott spoke of the rehabilitation of the footballer after injury. He emphasized the importance of accurate diagnosis before treatment and especially the importance of x-rays as an aid to diagnosis - particularly in relation to ankle and knee injuries e.g. the importance of taking anterio posterior x-rays of the ankle with the foot in full inversion and of the knee joint with valgus strain even if this involves giving the player a full anaesthetic. He made the point that an injury which might not cause noticeable disability to a working man could cause severe impairment of efficiency in the footballer e.g. minor sprains, contusions and abrasions. The more severely injured player should come off the field - have adequate first-aid, be transported home and not go out on Saturday night. He must have immediate instructions on the maintenance of muscle tone e.g. quadriceps exercises in the case of knee injuries and, in the case of lower limb injuries generally, the importance of non-weight bearing exercises during the first few days was emphasized. Dr. Scott then described in detail the various forms of physiotherapy which are subsequently employed and emphasized, the importance of the player understanding why this is being done. This is followed by a regime of increasing weight-bearing, but this must be restricted within the limits which cause pain or swelling. He referred to the psychological reactions of different players to injury and of the importance of realizing this so that the extrovert does not resume training to soon or the introvert does not delay too long. The next stage was to start a routine of graduated exercises on the field starting with limited running and progressing by stages to kicking the ball and gradually increasing activity till the player is 100% fit. No player who has not proved himself 100% fit should be considered for selection and pre-match fitness tests after injury are vitally important.

This was followed by a very interesting open forum at which the audience was invited to put questions. The number of questions asked was a very gratifying demonstration of the interest prompted by the Conference.

Some of the more interesting points raised are set out below:

**Question:** There are more well-intentioned, unlicensed, medical practitioners connected with football than in any other sport. Could not something be done to help people to acquire proper knowledge?

**Answer:** Chairman This could well be an extension of the work which the British Association of Sports and Medicine is attempting and in any case local people desirous of such help should contact the
Secretary of this Conference.

Question: Is there wisdom in injecting a local anaesthetic into a muscle injury?

Answer: This was immediately rejected by one of the speakers who pointed out that such an anaesthetic would inhibit the protective mechanism and the result might be an even worse injury after the game. Another Doctor pointed out that there were two injections to be considered, one to relieve pain which should not be done in order to help the player to continue and another was to relieve the swelling if this was the only problem involved.

Question: Would the speakers support the principle of the application of an ice pack after injury?

Answer: General agreement that this would be most valuable in reducing the pain from swelling and effusions. Another Doctor suggested the consideration of anti histamines which were far more modern way of reducing swelling and odoema. As with the injections, however, it depended whether the player was to continue with his game or not. If the game was over anti-histamines were suggested as possible, applied either by mouth or by ointment before dressing. The other advantage of anti-histamines was that it helped to make a player sleepy and thus kept him in bed especially on Saturday nights.

Question: Would the speakers make any comment on the design of modern football boots?

Answer: Two Doctors indicated that professional club doctors were of the opinion that injuries to ankles had increased since football boots had become football shoes. It was also pointed out that they came off far too easily at the match.

Question: Was the modern practice of playing without shinguards advisable?

Answer: Two of the speakers were most emphatic in stating that their club players were instructed to wear shinguards and it was also said that at international level the same insistance in relation to shinguards was followed.
Question: Was there much wisdom in pre-season road work by footballers?

Answer: The development of stamina was desirable but the choice of terrain and the frequency of running for stamina development needed more thought. Running on roads was unkind to feet and shins and in the case of one professional footballer whose first stamina run was one of 13½ miles on roads he was missing from the game for five weeks afterwards.

At this point there was an interesting discussion on warming-up but time was fast running out and, regretfully, the Chairman closed what had been a very interesting and informative Conference in the North-East.