

TABLE IV

## Influence of playing position

Forwards	In scrums	Other	Backs	
Prop	6	7	Scrum 1/2	2
Hooker	9	2	5/8	4
Lock	—	2	3/4	1
Back row	1	4	Wing	4
Total	16	15	Fullback	3
All	31		Total	14

the scrum has not been highlighted as a source of danger. It would seem that if the two front rows were to engage with correct binding and positioning, and the other five players were then to join the stable structure so formed, a better and safer scrum might result.

Both the tackler and the ball carrier were at risk in tackles, the ball carrier often being injured, however, in the maul or ruck that followed the tackle. A total of 15 players were injured in rucks and mauls and this aspect of the game also needs careful study. Only two players felt that foul or illegal play had caused their injuries, one claiming a scrum had been collapsed deliberately, the other having been kicked.

Immediate management of the injured players were generally satisfactory, and the fact that two-thirds of the accidents were attended and managed by members of the St. John's Ambulance Brigade was impressive evidence of the debt the game owes to this organisation.

A matter for great concern was that only one player reported that he had been aware that he was in any danger at the time of his accident, so 53 players presumably made no effort to avoid the danger of hyper-extension and hyperflexion with or without rotation. The authors believe that greater attention to coaching players to awareness of danger and the importance of maintenance of the head in a neutral position (preferably with the head sunk into the shoulders as far as possible to decrease leverage when entering danger e.g. rucks and mauls) would help to reduce the number of accidents.

In conclusion, the study shows that the risk of serious cervical injury in rugby is small. Nevertheless, it is believed that there are some areas in which the risk could be further reduced, by changes in the game's laws and by the promotion of awareness of danger among players, coaching in correct techniques and firm refereeing is essential. Consideration must be given to changing the laws of the game.

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## DISCUSSION

*Dr. Lucking:* I'd like to ask Dr. Burry if injuries are related in any way to ground conditions, and also ask him to comment on the five fatalities in one year.

*Dr. Burry:* Dealing with the second point first, I don't think one could say it was any more than chance. There was no overall trend, it just happened that we got such a phenomenon in one year. One of the important points in our survey was that we were able to see that there wasn't an escalation over a period of time, but these events occurred quite by chance. A major factor was the way the game was played, and Dr. Davies will report on a survey of the incidence of injuries in the British Isles. This was a carefully designed study, and seemed to show that a lot of injuries occurred because of foul play. We were grateful to discover that only two victims — and remember we are talking about people likely to feel ill-used — felt that they had been deliberately fouled. One victim felt that he had been deliberately kicked while he was on the ground, while the other felt he had been injured in a scrum. None of the victims felt he had been injured as a result of foul play. Ground conditions seem to be of no importance. The ground is firm to hard at the beginning and end of the season, and usually very soft in the middle, but this seemed to make no difference. I think that the only indication of playing surface affecting injuries is that two or three players were hurt because they slipped going into a tackle.

*Dr. Thomas:* Does the class of game affect the type of injuries that occur?

*Dr. Burry:* The survey centred on injuries in school and club games. What is interesting is that there has never been a fatal injury in an international game in New Zealand. Although there is a much greater bulk of players, in, say, the scrum, the players' expertise prevents them being injured.

*Mr. Williams:* Your figures seem to agree with mine; it is the young inexperienced players who are injured, especially in the scrum. Injuries also seem to occur more frequently at the beginning and end of the season suggesting that people who are less fit are more likely to be injured in a scrum collapse. However, 50% of injuries occur outside the scrum, and are caused by incorrect tackling, indicating the need for expert coaching.

*Dr. Burry:* Yes, I feel that the loose maul is extremely dangerous, with people being more likely to be injured than they are in a scrum collapse.

*Dr. Crean:* Have you done any comparative work with Rugby League players who seem to have perennial difficulty forming scrums, and would you comment on short-arm tackles, which are not mentioned in your statistics?

*Dr. Burry:* The answer to the first question is "No". The answer to the second is that a double tackle is more likely to cause injury than is a short-arm tackle; the double tackle really is very dangerous.

*Mr. Williams:* The two mechanisms of injury are, of course, completely different. One is a hyperextension, while the other is a hyperflexion.

*Dr. Mackenzie:* Dr. Burry says there is no connection between the stage of the game and the incidence of injury. However, looking at recent matches, it seems that the first ten minutes of a game are more likely to cause problems.

*Dr. Burry:* Dr. Davies's paper shows the preponderance of injuries in the last quarter, caused perhaps by tiredness or frustration.

## BOOK REVIEW

**Title:** YOUTH AND PHYSICAL FITNESS  
**Editor:** Zdenek Placheta  
**Publisher:** J. E. Purkyne, University BRNO, Medical Faculty, Czechoslovakia  
 Price: DM 8.50 from Kubon & Sagner, Postfach 68, D-MÜNCHEN 34, Germany

The book presents the results of a longitudinal study of 12-15 year old boys, between the years 1972-75. The authors have examined a large number of functional and morphological parameters which have been comprehensively discussed under relevant chapter headings, such as "Growth and Physical Fitness", "The Cardiovascular System" and "The Development of Performance Capacity".

Each chapter includes a comprehensive reference section, that draws attention to work done by researchers in Eastern European Countries. The data is well tabulated and presented, giving a clear concise English translation.

The study does have some procedural weaknesses particularly in the selection of sports activities which seems somewhat arbitrary, and in the degree and amount of training between the sports groups. However, this longitudinal study is most welcome, and many of its findings contribute to present knowledge of the interaction between physical activity and growth and development.

The book will interest physical educators and medical colleagues who have specific interests in anthropometry, and exercise physiology.

**P. Bale**  
**R. Watson**