CARDIOVASCULAR DISORDERS AND MORTALITY RATES IN AMPUTEES

Two years ago a medical committee under the chairmanship of Sir Ernest Rock Carling presented a final report to the Ministry of Pensions on the results of an investigation into the longevity and liability to cardiovascular disease of Service amputees from the First World War (see *British Medical Journal*, 1953, **1**, 717). The investigation suggested that those who had had severe wounds and amputations experienced later a higher mortality rate, that in those with leg amputations cardiovascular disorders were a commoner cause of death than would be expected, and that a history of "serious sepsis" following wounding was somehow related to these findings. The committee has now reviewed the evidence, and has written to the Chief Medical Officer of the Ministry of Pensions and National Insurance in the following terms:

"In our 'Final Report' on 'Cardio-vascular Disorders and Mortality Rates in Amputees' we stated that although the conclusions affirmed earlier in the Interim Report were not materially altered by our subsequent deliberations we nevertheless found upon analysis some variation in particular groups and we indicated that specialized pathological and clinical research might contribute advantageously to our knowledge. Accordingly the Ministry of Pensions made arrangements for the medical examination of some 4,500 amputees with 1,000 non-amputee pensioners as 'controls.' It is regrettable that the figures obtained by the examination of living amputees failed to provide statistically significant evidence largely because of the failure of a considerable number of those, in what was intended to be a representative sample, to attend for examination. So far as it goes the evidence obtained discloses no excess of high blood pressure among amputees and no material excess of cardiovascular disease.

"Having now reviewed the whole of the evidence from all sources, we find that:

"Out of every 1,000 *amputees* alive in 1930 there was a mean annual mortality of 12.6 in the years 1930 to 1950. Out of every 1,000 of the *general population* of comparable sex and age alive in 1930 there was a corresponding mean annual mortality of 11.4. The mean annual mortality rate of amputees was therefore just over one per thousand in excess of that of the corresponding general population. Expressed differently this means that, starting, say, with 100 amputees alive in 1930, 25 had died by 1950 compared with 23 of the corresponding general population.

"Out of every 1,000 who had suffered *wounds not leading to amputation* there was a mean annual mortality of 13.15 in the years 1930 to 1950. Out of every 1,000 of the general population of comparable sex and age alive in 1930 there was a corresponding mean annual mortality of 11.9. The mean annual mortality rate of the wounded was therefore just over one per thousand in excess of that of the corresponding general population. Expressed differently this means that, starting with, say, 100 wounded pensioners alive in 1930, 26 had died by 1950 compared with 24 of the corresponding general population.

"With so small a difference of total mortality the actual distribution among the certified causes of death assumes very little importance. Some members of the Committee think that within the limitations of the statistical material available there is evidence of some slight excess of cardiovascular disease as compared with the normal population, with a consequential deficiency of deaths from other causes. The Committee as a whole, however, are still of the opinion indicated in the Interim Report that cardio-vascular diseases have not been experienced more frequently to an extent of any significance amongst the causes of death in limb amputees as compared with those with serious leg wounds without amputation.

"Some amputees, especially those with a high thigh amputation, necessitating a tilting-table, with excessive obesity or with severe stump pain find the wearing of a prosthesis an increasing burden as age advances. These may deserve individual reconsideration though other classes of pensioner will also find their disabilities more burdensome with the passage of time. Neither as regards their mortality nor their morbidity do amputees form a class apart. They have neither a higher mortality rate nor a higher cardio-vascular rate than other classes of seriously wounded.

"The committee have reconsidered the evidence as to sepsis as a factor and feel that they over-emphasized its importance in the last report.

"In conclusion the committee now advise on the terms of reference as follows:

"Limb amputations, and the subsequent wearing of a prosthesis, do not, in time, produce effects on the body as a whole which may initiate, or aggravate, cardio-vascular disorders to any significant extent.

"There is no material difference between the mortality rates of amputees, by reason of amputation, and that of the corresponding rates for pensioners who have suffered wounds not leading to amputation. Such excess as there is in both classes over that in the general population is quite small."

Correspondence

Brain Injury in Boxing

SIR,—I would like to congratulate you on the very able leader on boxing (*Journal*, December 25, p. 1535), as well as your decision to publish the pragmatic article by experienced experts (Drs. J. L. Blonstein and E. Clarke, *Journal*, December 25, p. 1523). I fear, however, that the latter article might be interpreted as indicating that all was well with amateur boxing, in regard to the incidence and severity of harmful sequelae, in so far as useful recommendations had already been made and some prudent practices adopted. I venture to doubt whether such a conclusion would be valid.

The sorbo-rubber floor (or the American equivalent) should not only be recommended but should be made compulsory. The matching of age and weight is not enough. Experience, competence, and adequate training are much more important, and no match should be allowed to take place in which one boxer is unskilled and unable to put up a reasonable defence. This not infrequently happens in inter-hospital boxing, where a novice is persuaded to enter on the chance of scoring a point, even without a win. It is true that referees do, nowadays, make better use of their right (and duty) to stop a bout where one opponent is obviously outclassed or has received a severe blow that renders him incapable of effective defence for a period of uncertain duration; but the possibility of the "loser" turning the tables by a lucky blow, or an unexpected recovery, often makes a referee unwilling to face the criticism of alleged untimely or premature intervention. Education of boxers and onlookers in this regard is still needed. Apart from physical injury, there is also the adverse psychological effect of taking one or more severe hidings from tougher and more experienced opponents.

Nevertheless, and in spite of the ominous stress your annotator felt bound to make on the fact that an aim of a boxer was to knock his opponent out (concussion), I still feel from the experience of some ten years of active participation, and many more years of interest, that boxing is sufficiently worth while as a virile character sport to justify our taking every precaution to ensure its continuation under conditions of reasonable prudency. Trials of skill, endurance, and courage will still remain in very full measure for those who enter the ring in combat.—I am, etc.,

London, W.1. S. LEONARD SIMPSON.

The Handicapped Adolescent

SIR,—In your leading article (*Journal*, December 25, 1954, p. 1536) under this heading you say, "There may in fact be some medical neglect of the problems of the adolescent," and you suggest that appropriate "attention is not always paid by our medical services to the late teenagers." One illustration of the truth of your statement concerns school-