DR. CURREY (*London*) I wonder whether you have had the opportunity of looking into the question of whether the presence of rheumatoid factors in the serum influenced the result of the agglutination test? Antiglobulins might augment the agglutinating property of a serum and this would clearly invalidate the test.

DR. LAWRENCE We have some experiments in progress to deal with that point. Actually the antibodies to *Salmonella* which were tested were somatic antibodies, so that they should have been IgM globulins which would not react with rheumatoid factor. I do not think that it is likely that that is the explanation, but it certainly needs checking.

Neuromuscular Disorders associated with Rheumatoid Arthritis. By D. I. HASLOCK, D. F. HARRIMAN, and V. WRIGHT (*Leeds*)

A study has been undertaken of 28 patients with rheumatoid arthritis who have had a motor point biopsy. The pathology of the excised neuromuscular tissue was examined. The patients formed four major groups:

- (1) Muscle cachexia,
- (2) Peripheral neuropathy,
- (3) Myositis,
- (4) Steroid myopathy.

Motor point biopsy was found to be the only certain method of differentiating Groups 1 and 2.

Discussion

DR. TALAL (*Bethesda*) We also have had a chance to observe patients similar to the first group that you described with the plasma cells. Do you think that such patients are more likely to show elevation of muscle enzymes in serum, and are they more likely to respond to immunosuppressive therapy?

DR. HASLOCK We have not estimated the muscle enzymes in the serum, so I cannot comment on that. It is a little difficult to assess the role and effect of corticosteroids. A disproportionate number of patients were taking corticosteroids when they came to biopsy. Whether this is a reflection of the fact that the more severely affected patients were given corticosteroids, or whether the corticosteroids played some part in the aetiology of some of these changes I do not know. We have had no experience with other forms of immunosuppression.

PROF. KELLGREN (*Manchester*) Have any of your patients suffered from the picture of profound myositis sometimes seen in rheumatoid arthritis with central weakness and high enzyme levels?

DR. HASLOCK These were not patients with malignant rheumatoid arthritis, but all of them showed disproportionate wasting. Not all of them showed global wasting. Some muscles, particularly the quadriceps, became more resistant to treatment and would be wasted. In one or two of the cachectic group we found that the proximal muscles were more affected than the distal. We have one case in which we carried out both proximal and distal

biopsy. The distal biopsy showed changes of neuropathy, the proximal biopsy changes of cachexia.

DR. BALL (*Manchester*) Were samples of non-motor point biopsy taken simultaneously?

DR. HASLOCK All were taken at the motor point.

PROF. DUTHIE (*Edinburgh*) Would you like to enlighten those who do not know the difference between Type 1 and Type 2 fibres?

DR. HASLOCK I think Dr. Harriman had better explain this.

DR. HARRIMAN Briefly, the difference between Type 1 and Type 2 muscle fibres is the difference between red and white meat. Most of us have a mixture of the two types of cells in all our muscles, whereas some animals have predominantly red or white cells. Type 1 is the slow-reacting cell with oxidase enzymes and staining darkly. Type 2 contains anaerobic enzymes, is fast-acting, and is responsible for quick movements. In recent years it has been demonstrated in man that every muscle has a mixture of these two cells; we found in two of our patients that the atrophy was greater in the Type 2 cells, while in the other patients there was a mixture.

PROF. DUTHIE (*Edinburgh*) Do you attach any significance to this?

DR. HARRIMAN Not yet. I think we have yet to learn much more about it.

Cost-benefit Analysis of the Treatment of Rheumatic Diseases. By R. G. BROOKS (*Department of Economics, University of Strathclyde*) Published November 1969 *Annals* 28, 655

Discussion

PROF. DUTHIE (*Edinburgh*) You say that, of the people you have interviewed, so many had surgery and all were successful. Was conservative treatment ineffective?

MR. BROOKS I did not consider the possible benefits from conservative treatment.

PROF. DUTHIE (*Edinburgh*) This would suggest that we could wipe out conservative treatment.

MR. BROOKS No, in the time available I could not study the effectiveness of conservative treatment.

PROF. DUTHIE (*Edinburgh*) Your cost benefit is related to a certain proportion of people who were operated on?

MR. BROOKS Yes, that is right.

PROF. DUTHIE (*Edinburgh*) If you are right, then surgery seems the thing to do. You can save all the money you spend by surgery.

MR. BROOKS If I had had the time and money I should have interviewed far more people to see whether conservative treatment had been effective. As stated in my paper, not all patient categories were interviewed, a