develop unless abnormal increased mobility is present in the MCP joints. In the present work two methods were used to study the mobility of MCP joints.

In 108 normal men and 120 normal women aged 18 to 80 years, the angle between the third (middle) and fourth (ring) fingers was measured in both hands. Standardized abducting forces were applied to separate these fingers, with the MCP joints at 90° of flexion. The same was done in thirty rheumatoid patients. In 47 of the normal subjects and in all rheumatoid patients, standardized axial traction was applied across the MCP joint of the third finger and the widening of the joint space was measured from radiographs.

In normal subjects the results of the abduction test showed that the response of the MCP joints was proportionate to the force, and viscoelastic characteristics could be demonstrated. Females were significantly more mobile than males, but there was no appreciable change in mobility with age. The dominant hand was less mobile than the non-dominant. In axial traction the normal subjects showed larger individual variations; otherwise the results were similar.

In rheumatoid patients preliminary results showed a tendency towards a bimodal distribution of mobility. Frank hypermobility was seen in about one-third, and was often present within the first 2 years of their disease. In some patients the collateral ligaments appeared to be weaker on the radial side of the MCP joint.

Discussion

DR. J. D. GOODE (*Hull and East Riding*) Was the hypermobility in any way related to treatment with corticosteroids?

DR. LOEBL None of the hypermobile rheumatoid patients were receiving corticosteroids; in fact, only two of the thirty rheumatoid patients were taking these drugs.

DR. M. I. V. JAYSON (*Bristol and Bath*) At a recent meeting of the Heberden Society Prof. Wright showed some nice x rays of gas induction when the MCP joints were under axial tension. In particular this occurred very suddenly. Did you find that your length change in extension occurred suddenly?

DR. LOEBL None of the joints was heard to 'crack' and in none of the radiographs were there any gas shadows. To make a joint 'crack' it has to be pulled fairly sharply; with my instrument the required traction load was reached gradually over 3 or 4 seconds.

DR. E. N. COOMES (*London*) What happened when you left the 5 kg. weight on the finger? Were there any symptoms due to taking up of the slack in the joint?

DR. LOEBL I think that with these two methods, the slack, if any, is taken up at the smallest force.

DR. E. N. COOMES (*London*) Yes, but presumably that is just as in the experiments that I performed on the knee (Coomes, 1962). There is a slack to start with and there is a further increase when the weight is left on longer. Did you find any increase? If so, at what rate did this occur?

DR. LOEBL Yes, there is a further increase which is due to creep. Its rate diminishes exponentially with time.

DR. E. N. COOMES (*London*) The point I am coming to is that when you draw the finger sideways you must have a fulcrum with two bits of cartilage pushing against each other, and therefore the creep that you are demonstrating could either be pulling the ligaments or compressing the cartilage. I suspect that it is the latter, because at the loads about which you are talking you do not normally get much extensibility.

DR. LOEBL I did take some further x rays during continuous loading and the creep appeared to be mainly, if not entirely, in the various ligaments which are stretched during the procedures.

DR. E. N. COOMES (*London*) I was referring to sideways movement rather than to pulling.

DR. LOEBL It is possible that in sustained abduction there is also progressive compression of articular cartilage. One cannot rely on the x rays, however, because the phalanx shifts to a different region on the metacarpal head where the cartilage may be thinner.

DR. E. N. COOMES (*London*) I was trying to draw comparisons with deflections of the knee joint.

DR. LOEBL Yes, that was a very similar experimental procedure and you showed that, in the knees, the articular cartilage was responsible for the creep. Yet *in vitro*, creep occurs in all types of connective tissues.

DR. J. A. COSH (*Bath*) Among your normal subjects were you able to identify any with hypermobility who were subject to arthralgia?

DR. LOEBL No, I excluded patients with abnormal hypermobility from the study of the normal subjects.

Reference

Coomes E. N. (1962) *Ann. rheum. Dis.*, 21, 378

Rheumatoid Arthritis, Typus Robustus. By W. H. D. DE HAAS, W. DE BOER, F. GRIFFIOEN, and P. OOSTEN-ELST (*Departments of Rheumatology and Anthropobiology, University of Amsterdam, and Department of Psychology, Amsterdam Centre for Rheumatic Diseases, Holland*)

A group was isolated of nine male patients with classical rheumatoid arthritis (RA) who had a striking discrepancy in common. On the one hand, they all had the prognostically unfavourable symptoms of subcutaneous nodules and a high titre in the Waaler-Rose test, while, on the other hand, they were robust, healthy, and working normally. This group, tentatively called robust type (Rob), was compared with two male RA control groups: one group of nine patients in remission (Rem), and the other of nine matched patients in an active phase (Act). The duration of the disease and the kind and number of the joints involved were comparable in the three groups.

This comparative study revealed additional sthenic properties of Rob; nearly all Rob did heavy labour, while all Rem had light adapted work, as had the four Act who

could work. Grip strength and pain threshold were highest in Rob. Rob, somatologically, were mesomorphs (athletes) whereas the pattern in Rem and Act was mixed.

A psychological interview revealed Rob, and also Rem, to be sthenic, with a firm tendency to independence, as compared with a passive attitude, a waiting to be cared for, in Act. A neuroticism test likewise showed a lesser neurotic trait in Rob and Rem than in Act.

Rheumatoid nodules, however, were absent in all Rem and in five Act. The titres of the Waaler-Rose test were much lower in Rem and Act, although the erythrocyte sedimentation rate and the immunoglobulin levels differed very little. The x ray pictures were similar.

The obvious question whether we do not treat our patients too soft-heartedly requires an individual answer.

Discussion

DR. F. DUDLEY HART (*London*) What about the analgesic consumption?

DR. DE HAAS The use of analgesics and also the need for physiotherapy was much less in the robust type, four of whom required no treatment at all.

DR. A. ST. J. DIXON (*Bath*) I was delighted with this paper because it partly explains a recent observation. I have been collecting patients with large nodules and have expected to find them seriously ill, but in fact nearly all were very active robust types, as you have been saying, and many would not consider themselves in any way abnormal.

PROF. DR. H. A. VALKENBURG (*Holland*) What proportion of the total number of rheumatoid patients consists of this robust type? If it is only 1 per cent. or less, then they belong to the far end of a normal distribution curve and I wonder whether the features of 1 per cent. of a total group can be applied to the rest.

DR. DE HAAS This is a very difficult question to answer. I have about a thousand patients with rheumatoid arthritis and altogether this group of patients increased within a year from nine to eighteen, so this would represent about 2 per cent.

DR. E. N. COOMES (*London*) Can you tell me on what your neuroticism scores were based?

DR. DE HAAS We have a Dutch neuroticism score which is rather difficult to translate into English.

DR. E. N. COOMES (*London*) Does this alter depending on how ill you feel? We have demonstrated that a wide variation occurs depending on how ill the patient feels (Coomes, 1970).

DR. DE HAAS No, this is a long questionnaire with about 106 to 108 questions. It is meant for patients who think themselves normal.

PROF. E. G. L. BYWATERS (*Taplow*) This is very interesting but I am not quite sure how much is due to selection. You originally had in mind an idea of a constellation of various signs and historical facts. You then

chose nine people who represented this idea, but it does not mean to say that the condition is an entity. Some things tend to go together and everybody knows that if you have, for example, a bad shoulder on one side you get nodules on the opposite elbow. The nodules come with use and with work so that if you chose people because they were able to work and were robust you would expect them, I think, to show fairly big nodules. If you looked at an unselected series of rheumatoids with large nodules, would you find the same thing?

DR. DE HAAS One of Professor Bywaters famous dogmas was that, if you immobilize patients with rheumatoid arthritis, the disease dies down but the patients become vegetables. Now this study started off by isolating patients on clinical grounds. Later I tried to move from subjectivity to objectivity and that is how the series was obtained. You can find other patients with some of these qualities but not all of them. When I tried the reverse I found that, for example, the mesomorphs among the patients in remission or with active disease did not show the other qualities found in the robust patients. That is why I still think they constitute a special type.

DR. J. K. VAN DER KORST (*Holland*) Have you any information about the spine and sacroiliac joints in these patients?

DR. DE HAAS I obtained sacroiliac x rays in all of them because there are certain mental differences between ankylosing spondylitis and rheumatoid arthritis.

DR. J. K. VAN DER KORST If you could pursue this study further, you would need some criteria for forming your robust type group. What kind of anthropological or psychological criteria would you use?

DR. DE HAAS I should have to start off with some of the doubtful criteria that have been given in this paper. Perhaps later on I could drop some, but I have not yet determined exactly what the criteria would be.

Reference
Coomes, E. N. (1970) *Ann. rheum. Dis.*, 29, 562

Tangential X-ray of the Forefoot in Rheumatoid Arthritis. By S. L. GHEITH and A. ST. J. DIXON (*Royal National Hospital for Rheumatic Diseases, Bath*)

The anteroposterior tangential view of the metatarsal heads in partial weight-bearing helps to explain many of the clinical observations on the rheumatoid foot. In one hundred consecutive patients with this disease in whom a standard x ray of the foot was ordered, the tangential x ray was taken in addition. Similar views were obtained in fifteen normal controls.

Findings of importance in the evaluation of patients for forefoot arthroplasty or fitting of medical shoes were as follows:

- (1) Loss or reversal of the normal transverse arch of the foot in 66.
- (2) Dislocation of sesamoids (partial in 47, complete in 24).
- (3) Osteolysis and/or spike erosions of metatarsal heads, causing pressure on plantar skin from inside the foot in 54.