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. VANDER 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.

(4) Thinning or flattening of the normal fibrofatty cushion in 83.

The method can also be useful in evaluating bursagrams and sinus tracks.

Discussion

DR. G. VANDAM (*Holland*) Is it not rather painful for some patients with rheumatoid arthritis to stand on their forefeet?

DR. DIXON No, we have not had any great difficulties. The patients stand on one foot and are supported by the hand or with the back of a chair and they can keep this position for a moment or two.

DR. G. VANDAM (*Holland*) Did the *x* rays influence the shoes that you prescribed for the rheumatoid arthritis patients?

DR. DIXON We have not yet decided what type of shoe these patients should have. We have a very limited selection of shoe types available so I do not think it would be very helpful here, but it does help us to explain why some patients have very painful feet and need a special shoe whereas others with apparently quite marked deformity on the anteroposterior *x* ray can manage with ordinary commercial shoes.

DR. G. VANDAM (*Holland*) Does this not give any idea as to what to do for patients with painful feet?

DR. DIXON We can give surgical shoes or operate as the case may be. The Kates-Kessell forefoot arthroplasty is very successful in some patients. Others, however, are not suitable and most of them will be fitted with surgical shoes or, as I prefer to call them, 'medical shoes'. We use a

system with a heat-moulded shoe made to a modified plaster cast of the patient's foot. In our follow-up study this has given successful first fitting in 85 per cent of cases. I do not know if the *x* ray only could guide us as to which procedure is more likely to be successful; this depends on the total clinical picture.

DR. B. M. ANSELL (*Taplow*) We do not usually think of the great toe as being involved early on in arthritis. Can you explain why the sesamoids move so early?

DR. DIXON I believe this is a phenomenon similar to ulnar deviation of the hands. Weakening of the fibrous structures around the joints allows the tendons to shift laterally from their normal sites and once they start to shift the whole movement becomes self-perpetuating. The sesamoids act as *x* ray markers for the anatomical position of the powerful flexor hallucis tendon.

PROF. E. G. L. BYWATERS (*Taplow*) Deviation of the great toe is very common in English women. Do you think it might pre-date the rheumatoid arthritis?

DR. DIXON I sometimes find it very difficult to differentiate the late rheumatoid foot from the very same deformity due to shoes but without arthritis, and this is particularly so in elderly women who have been through the whole gamut of shoe fashions. I am sure the deformities have a common mechanical basis. In patients with rheumatoid arthritis with soft ligaments, the joint is much more liable to this deformity but, as you know, one may find a small amount of erosion of the second metatarsal head from tendon pressure from a severe hallux valgus without rheumatoid. When there is already a tendency to develop hallux valgus this is highly accelerated by rheumatoid arthritis.