AAPP excretion in as much as they showed a number of features of "malignant rheumatoid arthritis" as described by de Sèze (1965). There was no correlation, however, between the abnormally raised AAPP excretion and the rheumatoid factor titre or the erythrocyte sedimentation rate. After a 3-year clinical follow-up these same six patients had shown an unrelenting course of their disease, without notable remission, on conventional treatments such as aspirin to tolerance, low dose steroids (≤ 10 mg. prednisone/day), and/or gold salts.

This test may thus provide a biochemical basis for the clinical diagnosis of "malignant rheumatoid arthritis" and may turn out to be of prognostic value.

Discussion.—DR. J. H. GLYN (*London*): Is it possible to state either from your work, or from previous published work, whether the administration of steroids in large doses will alter the excretion of mucopolysaccharides? It seems possible that some of the therapeutic effects of steroids in connective tissue pathology could be exerted on the ground substance.

DR. BITTER: I am afraid I cannot answer this question, as we investigated all patients (except five with SLE) before any steroid treatment was given.

DR. A. ST. J. DIXON (*Bath*): The trouble with excretion studies is that they reflect both the rate of production of the material you are studying and the rate of renal excretion. I am wondering whether it might not be a renal factor which is at fault, particularly in the lupus case. Have you any data on the clearance of this material?

DR. BITTER: Concerning the effect of renal disease on the rate of excretion of acid mucopolysaccharides, the data in the literature are scanty and contradictory. In amyloid renal disease, however, investigators agree that the excretion of these substances tends to be diminished. None of this series of patients with RA had clinically detectable renal disease, nor did those with various connective tissue diseases, nor did four out of the ten with SLE. Thus the data presented would not tend to suggest that the raised AAPP excretion found in a few patients was necessarily an expression of renal disease. Serum levels were not determined.

DR. W. CARSON DICK (*Glasgow*): First, have you had the opportunity of studying any of the rarer mucopolysaccharidoses; and secondly, have you examined the relationship between your method, older standard methods, and other indices of connective tissue metabolism, for example hydroxyproline excretion rates?

DR. BITTER: Yes. In fact the method had been first worked out to correlate the haematological findings in gargoylism with the urinary excretion of AAPP (Muir, Mittwoch, and Bitter, 1963), and to assess the latter as a diagnostic parameter in Morquio's disease (Bitter, Mittwoch, Muir, and Scott, 1966).

Hydroxyproline determinations were carried out in the (non-dialysed) urine of the patients and controls presented in this communication. However the reproducibility and predictability of this parameter does by no means approach that of the excretion rate of AAPP and Dr. Barbara Ansell kindly suggested that the former should not be included in the present communication.

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Chronic Fluoride Intoxication. By T. VISCHER (*Basel, Switzerland*): In some countries, fluorides are used tentatively in the treatment of osteoporosis, metastatic bone disease, and Paget's disease.

Fluoride influences bone formation and may lead, in higher dosage and with intake over longer periods, to fairly characteristic bone changes. Chronic fluoride intoxication seems to be a good model for studying the possible adverse effects of fluoride treatment. Recently we had the opportunity to examine elderly workers from an aluminium plant who had been exposed to cryolith dust for periods up to 50 years. Radiological evidence of chronic fluorosis of the bones was confirmed by histological examination and by determination of fluoride in the bone ash. Some patients complained of vague rheumatic pains, but no specific pattern could be established.

Discussion.—DR. J. H. GLYN (*London*): Are these changes reversible, if the subject is removed from the source of fluoridation?

DR. VISCHER: They are not reversible; I have the impression that they increase with time. This is probably a combination of degenerative changes and fluorotic changes.

PROF. E. G. L. BYWATERS (*Taplow*): I should like to ask if there were any cases in which the changes were confined to the spine, because it must be quite difficult to differentiate these changes from those of senile hyperostotic spondylosis, which is a normal accompaniment of old age. For instance, say in the thoracolumbar spine, was the ligament calcification visible on the right side only as in hyperostotic spondylosis?

DR. VISCHER: There was no difference in side. In addition all patients had more impressive changes peripherally.

A New Syndrome? By M. I. V. JAYSON (*Royal National Hospital for Rheumatic Diseases, Bath*): Conditions such as rheumatoid arthritis, gout, and osteoarthritis are well defined, but many patients present with recurrent aches and pains in whom no objective changes are found and in whom no specific diagnosis can be made.

Three patients with a long history of recurrent arthralgia but without physical signs of arthritis or laboratory

or radiological changes were presented. Two had been previously diagnosed as "neurotic" and one as possible rheumatoid arthritis.

Arthroscopy and synovial biopsy in these subjects was normal. Measurements of the intra-articular pressures in the knee with varying volumes of simulated effusion showed that the elastance or pressure change for unit change in volume was considerably higher than in normal subjects.

It is suggested that in this syndrome there is an abnormality of the joint lining, producing a specific physical change of increased stiffness. Use of the joint causes abnormal tensions in the tissue and recurrent pain.

Discussion.—**PROF. E. G. L. BYWATERS (Taplow):** It is very interesting that similar rheumatic symptoms appear to occur both in hypermobile and in hypomobile patients. I do not see why this result should not be obtained from subjects with abnormally small joints. What happens if you take a child's joint and put fluid into it? Would you not get the same type of curve?

DR. JAYSON: We have not examined joints from any children. The youngest person examined was aged 18. The normal controls were of all sizes, shapes, and nationalities, and the smallest of them gave the highest pressures, but these were considerably lower than those recorded in our three patients.

PROF. E. G. L. BYWATERS (Taplow): If you have a very small joint space, say a rheumatoid joint, which is fibrosed until there is only a few ml. of space left, would one not get curves like those you have shown?

DR. JAYSON: One would, but in these three patients there was no evidence of objective disease. There may be many causes for this specific physical change in the joint capsule, but the end-result is increased joint elastance. I suggest that this change is responsible for arthralgia in this condition and also in many types of arthritis.

DR. J. BALL (Manchester): Would variation in permeability affect results? If there was a low permeability in the joint membrane or joint capsule, then the fluid might accumulate, and *vice versa*.

DR. JAYSON: At the end of the experiment we aspirate all fluid from the joint and expect to obtain all of it back without significant loss.

DR. J. T. SCOTT (London): Was there any clinical pattern in the arthralgia which might enable you in the future to suspect its presence from the history?

DR. JAYSON: The pattern was that of arthralgia present mainly in the large but also in the small joints. I think it would be difficult to define a pattern because I suspect that many conditions might lead to the end-result of stiffening of the capsule but with no residual clinical changes in the joint itself. The patient who had this as a result of rheumatoid arthritis might show more of these symptoms in the small joints of the hands than other patients who might show only degenerative changes in the capsule.

DR. V. WRIGHT (Leeds): Have you had the opportunity to analyse the first part of the curves, which is probably the most meaningful physiologically. Our work with skin suggests that the initial part may well be due to elastin rather than collagen. I was not quite clear from your slide about diseased patients, how you interpreted the different curves? Did you think there were differences in elastin or did you think there were differences in collagen? Finally, for the sake of accuracy, I think we should describe your findings as intracapsular pressure and not intra-articular pressure; the former is 15-20 lb./sq. in. compared with a pressure of 400 lb./sq. in. or more between the articular surfaces.

DR. JAYSON: I accept your point. The interpretation of the curves is rather difficult. It is possibly speculative to suggest that the empty joint is controlled by elastin and the distended joint by collagen, but the shapes of the curves fit in with this hypothesis and it does appear that there may be functional shortening of the unstretched length of collagen fibres. It would be possible to obtain pressure changes of this magnitude, but with a differently shaped pressure/volume curve, so that the unstretched length of the collagen fibres would be similar to that of the controls, so I think that we have demonstrated a real change here.

DR. R. HARRIS (Buxton): Have pairs of joints been examined?

DR. JAYSON: Very similar results were obtained in all the normal controls, and repeated measurement in the same knee in two subjects and both knees of another produced similar results.

Extra-articular Calcification mimicking Acute Arthritis.
By **DR. A. J. SWANNELL** and **DR. A. ST. J. DIXON (Royal National Hospital for Rheumatic Diseases, Bath):** Calcium deposition occurring outside the joint must be distinguished from calcification within the joint cartilage (chondrocalcinosis). Painter (1907) first described such deposits near the shoulder, and Sandström (1938) and Gondos (1957) observed them in tendons surrounding other joints. Sandström emphasized the disappearance or decrease of the deposit after the acute phase had resolved. Pinals and Short (1966) and McCarty and Gatter (1966) stressed the similarity to acute gout and Thompson, Ming Ting, Riggs, Fenn, and Denning (1968) identified hydroxyapatite crystals from the calcific deposits—another point of difference from chondrocalcinosis.

We present eighteen patients who had radiologically demonstrable single or multiple calcific deposits, most of whom had normal serum uric acid, calcium, and phosphorus levels. All presented with acute pain and swelling and with limitation of movement of the underlying joint. The shoulder was affected in seventeen attacks in ten patients, and the wrist, fingers, and hips were involved once each in two patients. The great toe was involved once in four patients, with striking resemblance to acute podagra. Recurrence involving the same joint occurred in six out of the eighteen patients. In fifteen patients more than one joint was involved. Some patients with recurrent and typical painful episodes associated with radiologically apparent deposits also had