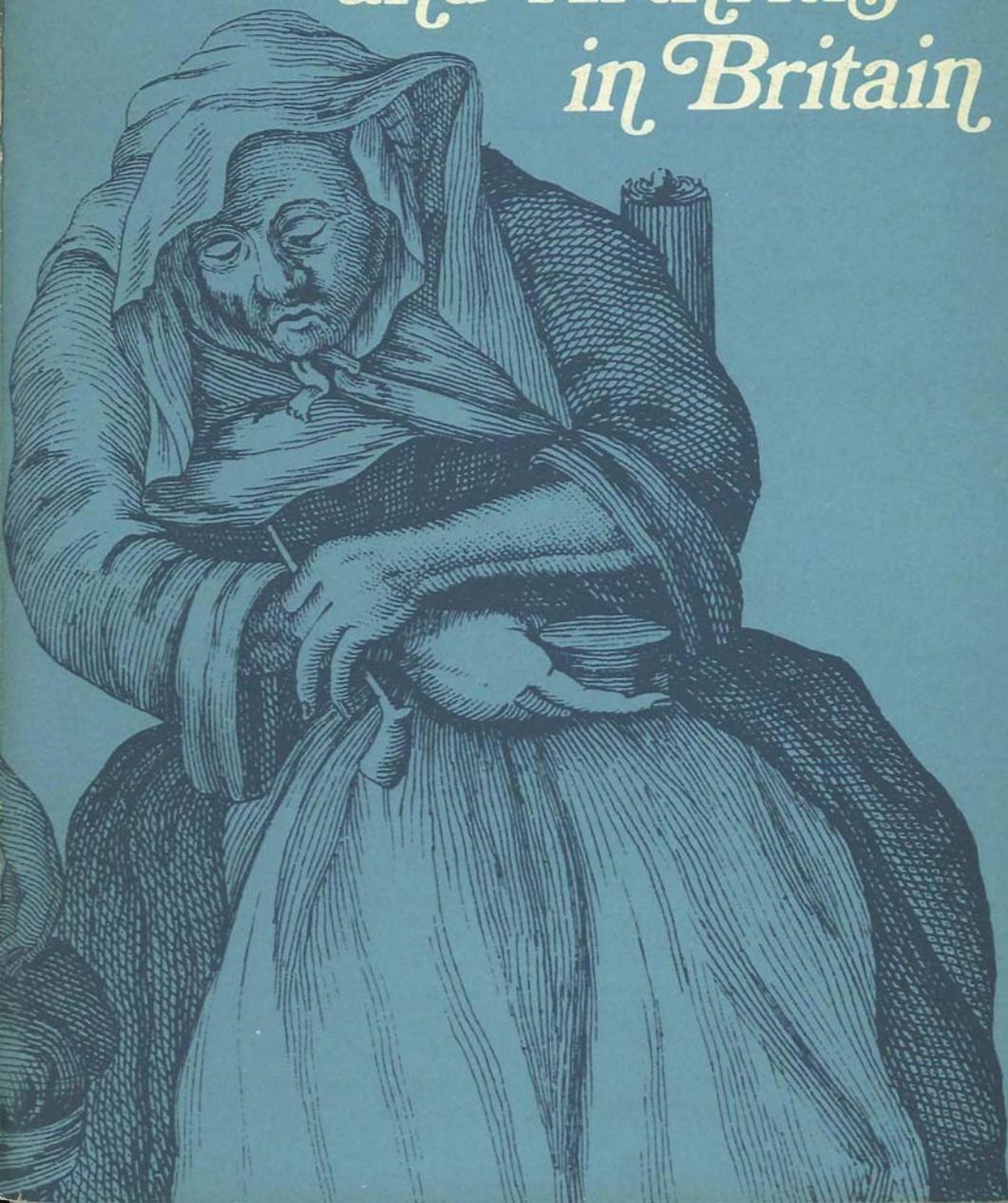


*Rheumatism  
and Arthritis  
in Britain*



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*Rheumatism  
and Arthritis  
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**Office of Health Economics**

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## Glossary

**Arthritis**

Inflammation of a joint or joints.

**Arthrosis**

Joint degeneration without inflammation.

**Bursa(e)**

A closed sac, lined with a synovia-like membrane, containing fluid found or formed in areas subject to friction, for example where a tendon passes over a bone.

**Bursitis**

Inflammation of bursa(e).

**Erythrocyte sedimentation rate**

The degree of rapidity with which the red cells sink in a mass of drawn blood. This serves as a measure of inflammation.

**Hyperuricaemia**

An excess of uric acid in the blood serum.

**Rheumatism**

A wide term applied to the numerous conditions which cause pain in the muscles, joints and fibrous tissues.

**Rheumatoid factor**

An abnormal globulin (simple protein related to the body's immune responses) present in the blood of many rheumatoid arthritics.

**Sciatica**

Pain in the back of the thighs caused by the pinching of the sciatic nerve where it joins the spinal column.

**Synovial fluid**

Joint cartilage lubricant and nutrient; a fluid secreted by the synovial membrane around the joints.

**Synovitis**

Inflammation of the synovial membrane around the joints, generally the same meaning as arthritis.

**Tenosynovitis**

Inflammation of a tendon sheath.

## *Introduction*

During the past century the general improvement in living standards and the development of modern medicine have eliminated infectious disease as a major cause of mortality in Britain. The life expectancies of the average man and woman have been considerably extended so that the great majority of people now survive to become liable to the chronic conditions associated with advancing age.

The rheumatic diseases are one of the most widespread of these forms of complaint in all the developed countries. They resulted in over 37 million working days being lost in Britain during the year 1970-71. And they are the major cause of physical handicap amongst all age groups, causing especially widespread pain and disability amongst the elderly. A recent government social survey (Harris 1971) reported that well over one million people in this country have rheumatic conditions which cause them significant physical impairment.<sup>1</sup>

This paper looks at the rheumatic diseases with special reference to the availability of methods for preventing where possible either their occurrence or their destructive effects and painful symptoms. It also examines the degree to which the symptoms of these illnesses are affected by the physical and social environments of those who suffer from them and the significance of such findings in health and welfare service planning.

## *The rheumatic diseases*

Ignorance of the causes of this large group of conditions has prevented the construction of a logical classification of them. That shown in Table 1 is simplified for illustrative purposes. A more comprehensive classification is provided in the appendix to this paper.

Confusion has also been caused by the vague and inconsistent use of terms. Rheumatism is a generic name for pain and stiffness of joints, muscles and related structures. In the past this term was also used to describe rheumatic fever. Arthritis refers more specifically to the inflammation of the joints, yet it is still often

<sup>1</sup> See footnote 2 on page 20.

**Table 1** *A simplified classification of the rheumatic diseases*

- 
- i) Degenerative joint disease – osteoarthritis.
    - a) Generalised examples – osteoarthritis associated with Heberdens nodes (hereditary factors probably involved).
    - b) Localised examples – osteoarthritis associated with congenital disorders such as dislocation of the hip or associated with trauma as in derangements of the joints (especially the knee).
  - ii) Arthritis occurring in conjunction with widespread inflammatory disease of unknown cause. Examples – rheumatoid arthritis, Still's disease (chronic juvenile polyarthritis), connective tissue disorders, psoriatic arthritis, ankylosing spondylitis, Reiter's disease.
  - iii) Joint disorders resulting from other causes.
    - a) Arthritis caused by known infectious agents, either bacterial, rickettsial, viral, fungal or parasitic. Examples – gonococcal arthritis, tubercular arthritis.
    - b) Arthritis associated with tumours or tumour-like conditions. As in synovioma, leukaemia, benign tumours of articular tissue, lung cancer.
    - c) Arthritis caused by biochemical abnormalities.
      - As in gout, haemophilia.
    - d) Arthritis associated with or occurring as a result of other disorders.
      - As in osteoporosis, ulcerative colitis.
    - e) Arthritis associated with allergies and drug reactions.
  - iv) Back pains.
    - Examples – displaced intervertebral disc (slipped disc), sciatica, spondylosis. Back pains may also result from conditions listed in other categories.
  - v) Acute rheumatism – rheumatic fever.
  - vi) Soft tissue or non-articular rheumatism.
    - Examples – tendinitis, tenosynovitis, bursitis, 'frozen shoulder' neuritis, tennis elbow.
- 

used in cases where inflammation does not occur. Arthrosis is a more accurate description of the latter type of condition and thus osteoarthritis now usually replaces the term osteoarthritis in recent British medical literature. Fibrositis is a vague term generally used where no more specific one is available. It also implies inflammation and it is doubtful whether it should be used to refer to any patient with a normal erythrocyte sedimentation rate (see glossary).

In terms of individual distress suffered the most significant of the disorders under discussion are rheumatoid arthritis and osteoarthritis. Despite the frequency with which they occur many people outside the medical profession have little idea of the nature of these complaints. In fact, rheumatoid arthritis is the result of the inflammation of the lining of the structures round the joints and it cripples by distorting or even breaking the joint surfaces and tendons and by interfering with the movement of the joints. Osteoarthritis is caused by the wearing away of the joint cartilage over the ends of the bones, so making the joints stiff and painful.

Regarding the economic consequences of the rheumatic diseases, back pain is probably the most important condition. It may have a variety of causes, such as a prolapsed intervertebral disc or sciatica, but because the symptoms are in most cases similar it is often referred to as a complaint in itself. Table 2 provides a brief description of the causes and symptoms of the most frequently encountered of the rheumatic illnesses.

### Common aspects of rheumatic diseases

Rheumatic diseases primarily involve the connective tissues of the body. These tissues are of a comparatively simple nature with limited, unspecialised functions and may react to many different types of damage in a fairly standard way, giving pain, swelling, stiffness and tenderness. Thus many different types of event which affect the musculo-skeletal system may result in the appearance of similar symptoms, a point which is particularly important for two reasons. First, it may result in an over simplification of the description of such diseases. Terms such as osteoarthritis may in fact cover a number of similar but distinct conditions occurring at various sites in the body. Second, it may make differential diagnoses particularly difficult even between fairly clearly described complaints unless detailed clinical examinations and extensive laboratory tests are made.

A second common factor in rheumatic diseases is that in the majority of cases they share the symptom of pain. The generalised and prolonged aches typical of rheumatism stem mainly from events deep inside the body tissues. Structures such as joint capsules and nerve and blood vessel sheaths are particularly sensitive. Kellgren has shown, by injecting saline solution into tissues, that the true origin of deep pain is difficult for a patient to recognise. This is particularly true of pain emanating from the spine. Deep pain is often accompanied by spots of referred tenderness which add to diagnostic problems.

Deep pain may cause muscle rigidity, an effect which can also be engendered by purely psychological activity. Both these forms of stiffness may be a result of, and at times also present symptoms of, rheumatic disease.

It has been observed that psychological factors also play a part in altering individuals' pain thresholds. This means that the level of stimulus needed to cause a person pain is not always the same but varies with conditions.<sup>1</sup> Changes in temperature may also

<sup>1</sup> For example, some women first become aware of osteoarthrotic symptoms at the time of their menopause although the first stage of degeneration may have commenced considerably earlier. Whether menopausal ('hot Heberden') arthritis should be regarded as a distinct form of osteoarthritis is doubtful.

**Table 2** *The major rheumatic diseases. A summary*

<i>Condition</i>	<i>Characteristics and causes</i>	<i>Prevalence</i>
Osteoarthritis	The joints are not inflamed and neither is rheumatoid factor present more frequently than the average rates, nor is the ESR raised. The disease often has an asymmetrical effect. Localised (secondary) osteoarthritis is usually the result of unusual wear or trauma relating to particular joints whereas generalised osteoarthritis may be the result of inherited or environmental (e.g. Kashin-Beck's disease) factors, or the after effects of an attack of ineffective polyarthritis. It is characterised by Heberden's nodes on the hands and occurs most frequently in females. However, it should not be forgotten that generalised osteoarthritis may frequently include a heterogeneous collection of separate diseases whilst the 'causes' of localised osteoarthritis may be merely precipitating factors. Osteoarthritis markedly increases with age although there are definite biochemical differences between senescent and osteoarthrotic cartilage.	Nearly all the elderly show some radiological symptoms of osteoarthritis and regarding the population as a whole about half do so. However, under 5 million people actually experience any painful symptoms. See Figure 2 for a guide to the increasing prevalence of degenerative disease with age.
Rheumatoid arthritis	A systemic disease with joint involvement characterised by inflammation, frequently culminating in considerable distortion because of tendon involvement. The ESR is raised and about three quarters of all affected have a rheumatoid factor present in their bloodstreams. Usually both sides of the body are affected symmetrically. It is most probably a result of the disturbance of the body's own immune responses resulting in the destruction of endogenous tissues, exogenous organisms perhaps being involved to in some way trigger or promote the process. An autoimmune aetiological explanation of rheumatoid arthritis has not, however, been definitely proven.	About 500,000 people suffer from the disease in this country, 400,000 of them women. The symptoms develop with age. See Figure 1.
Benign polyarthritis	This is the term applied to attacks of arthritis which affect several joints simultaneously for a limited period of time. It may be caused by a number of infective agents (see Table 1, Section iii). Normally no long term damage is done although episodes may be painful and disabling.	About 10 million of the people alive in Britain today have suffered an attack during their lifetimes.

Back pains  
(Displaced  
intervertebral  
disc, Lumbago,  
Sciatica,  
Vertebrogenic  
pain syndrome,  
Ankylosing  
spondylitis)

A major factor is the prolapsed (i.e. split and bulging) intervertebral disc which may affect nerve roots, as in sciatica, as well as causing soft tissue swelling and possibly affecting the neural canal. Postural faults or compensations, causing tendon and muscle strains, disc protrusions, osteoarthritis and intervertebral joint derangements may all cause back ache. Some other rheumatic diseases such as ankylosing spondylitis, which causes painful stiffness and ultimately the fusing of the spine in fixed flexion, also affect the back. In that much of the spinal region is inaccessible it is often very difficult to assess the causes of symptoms.

See text on rheumatism in industry and Figure 2 regarding intervertebral disc wear. Only about one third of those with radiological symptoms of disc degeneration experience them physically.

Gout

The articular manifestation of hyperuricaemia, gout is due to the deposition of sodium urate crystals in the soft tissues around the joints, classically attacking the big toe and causing intense pain. It is relatively rare, hyperuricaemia being much more common although the parameters used to define this condition are rather arbitrary. Gout is of interest in that it is, for practical purposes, the only 'curable' rheumatic disease.

Estimated to occur in between .2 and .5 per cent of European males.

Rheumatic  
fever

This disease is a result of streptococcal infection and is of importance because of cardiac sequelae, possibly caused by the cross-reaction of antibody to streptococcal material with components of the myocardial fibres. The prevalence of rheumatic fever has been much reduced during this century because of improved living conditions although that of rheumatic heart disease has not yet fallen. Prevention by antibiotics is possible but once rheumatic fever has developed they are of little value.

The rate of annual incidence of acute rheumatic fever amongst children (notified by the MOH) fell from over .5/1000 in 1948 to under .1/1000 by the mid 1960s. It has been estimated that there are about 200,000 people with rheumatic heart disease in Great Britain and that 11 million people have had rheumatic fever. There are now only 20,000 cases per annum.

have this effect, lowered temperature lowering the pain threshold. Thus the symptoms of rheumatic diseases may fluctuate in intensity for reasons other than ones specifically concerned with a change in the physical state of the individual. Prolonged pain coupled with the development of frustrating disabilities and the loss of normal activities often leads patients suffering from arthritis and rheumatism to become depressed. This may in turn lower their pain threshold and so increase their discomfort. To be successful the treatment of rheumatic diseases must be orientated towards alleviating not only physical symptoms but also commonly experienced psychological disorders often associated with these complaints.

## *Prevalence of the rheumatic diseases*

Estimates of the frequency of occurrence of diseases in a population are useful for two purposes, first to calculate the demand for curative and welfare services and second to provide a base from which ideas about their causes may be derived. Unfortunately, particular problems arise in the observation of rheumatic diseases. For example, many of these complaints follow a pattern which is either fluctuating, as in rheumatoid arthritis, or intermittent, as in gout, which may often result in diseases being mis-identified. The difficulty of making accurate diagnoses of rheumatic complaints leads to particular problems in the epidemiological study of rheumatic diseases.

Yet despite these difficulties a considerable amount of work on their prevalence has been carried out, much of it in this country having been financed by the Arthritis and Rheumatism Council, and it is possible to build up a fairly clear picture of the occurrence of these complaints amongst the population of the United Kingdom. There also exists a considerable body of work relating to rheumatism and arthritis in industry, its occurrence in familial groups and the extent to which these diseases cause handicaps and impairment in our society.

### **In the overall population**

Working in the late 1950s Logan and Cushion (1958) found that 'diseases of the bones and organs of movement' led about four million people annually in England and Wales to consult their general practitioners. Rheumatism and arthritis (ICD Nos 710-718

inclusive) caused about three quarters of these consultations. The total number of consultations occurring as a result of the rheumatic diseases was probably over five million because only about 75 per cent are covered by the classification 'diseases of the bones and organs of movement' (Anderson 1971). These figures indicate that rheumatic diseases are second only to respiratory infections as a cause of medical consultation in this country.

Between 1954 and 1959 a series of special surveys were carried out in Leigh and Wensleydale in northern England on the prevalence of rheumatic complaints. Sixty-four per cent of those interviewed (of working age and over) claimed to have suffered rheumatic symptoms at some time, 35 per cent of them at the time of the interview. Twenty-five per cent had lost work due to rheumatic complaints, 9 per cent at least three months. Amongst males the commonest cause of rheumatic disease found was intervertebral disc-degeneration and osteoarthritis and in females it was rheumatoid arthritis.

An idea of the prevalence of the most common of the rheumatic diseases, based on the findings of these surveys, may be found in Table 2 and Figures 1 and 2. However, the figures should be treated with some caution.<sup>1</sup> For example, those in Figure 1 came from an investigation which applied the American Rheumatism Association's criteria for rheumatoid arthritis, the use of which in surveys tends to lead to the exclusion of inactive rheumatoid arthritis and the inclusion of some cases of osteoarthritis. However, there are about half a million rheumatoid arthritics in Britain, about 400,000 of whom are women (Wood 1971).

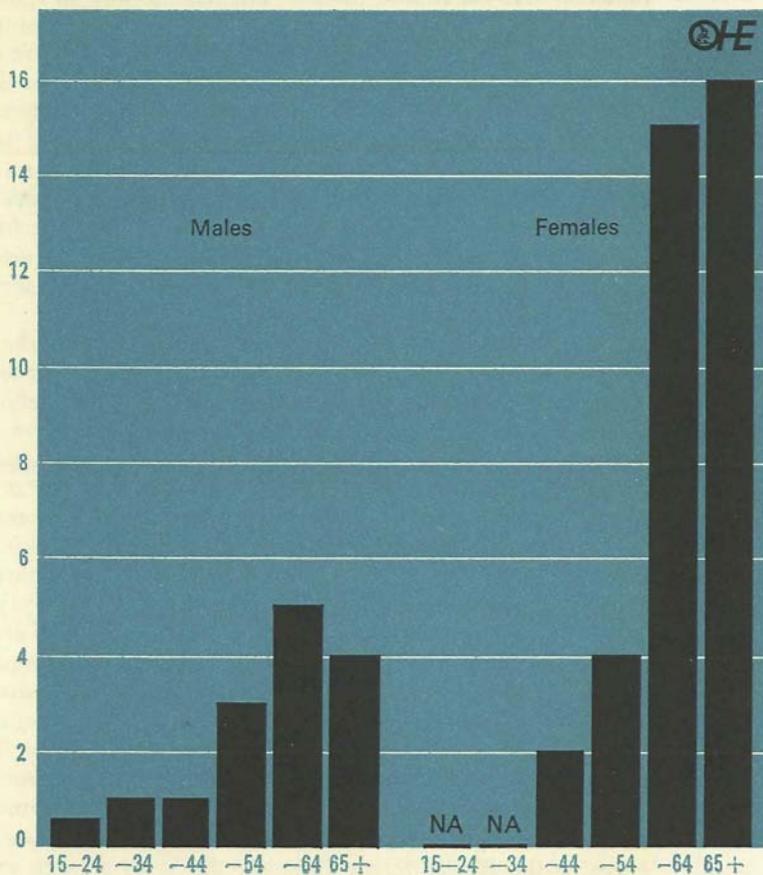
The difficulty of studying the occurrence of diseases of unknown aetiology is underlined by the fact that the tests for the presence of rheumatoid serum factors are 'falsely positive'<sup>2</sup> in three quarters of the individuals showing positive results and negative in a quarter of those actually with rheumatoid arthritis. Surveys undertaken in many parts of the northern hemisphere show very little variation in the prevalence of the more severe forms of the disease (Lawrence *et al.* 1966). There are more striking differences in the milder forms although this is to a large extent a result of classification problems.

<sup>1</sup> Figures derived from a survey in Watford in the mid 1960s investigating the possible side effects of water fluoridisation generally support the Leigh and Wensleydale findings. Fluoridisation was not found to cause any rheumatic complaints (Lawrence 1966).

<sup>2</sup> The presence of these antiglobulins often referred to as 'rheumatoid factor' is an important diagnostic test for rheumatoid arthritis. The use of the term 'falsely positive' is incorrect in that these antiglobulins are quite frequently found in individuals not suffering from rheumatoid arthritis. Such positive findings are, in a literal sense, not false.

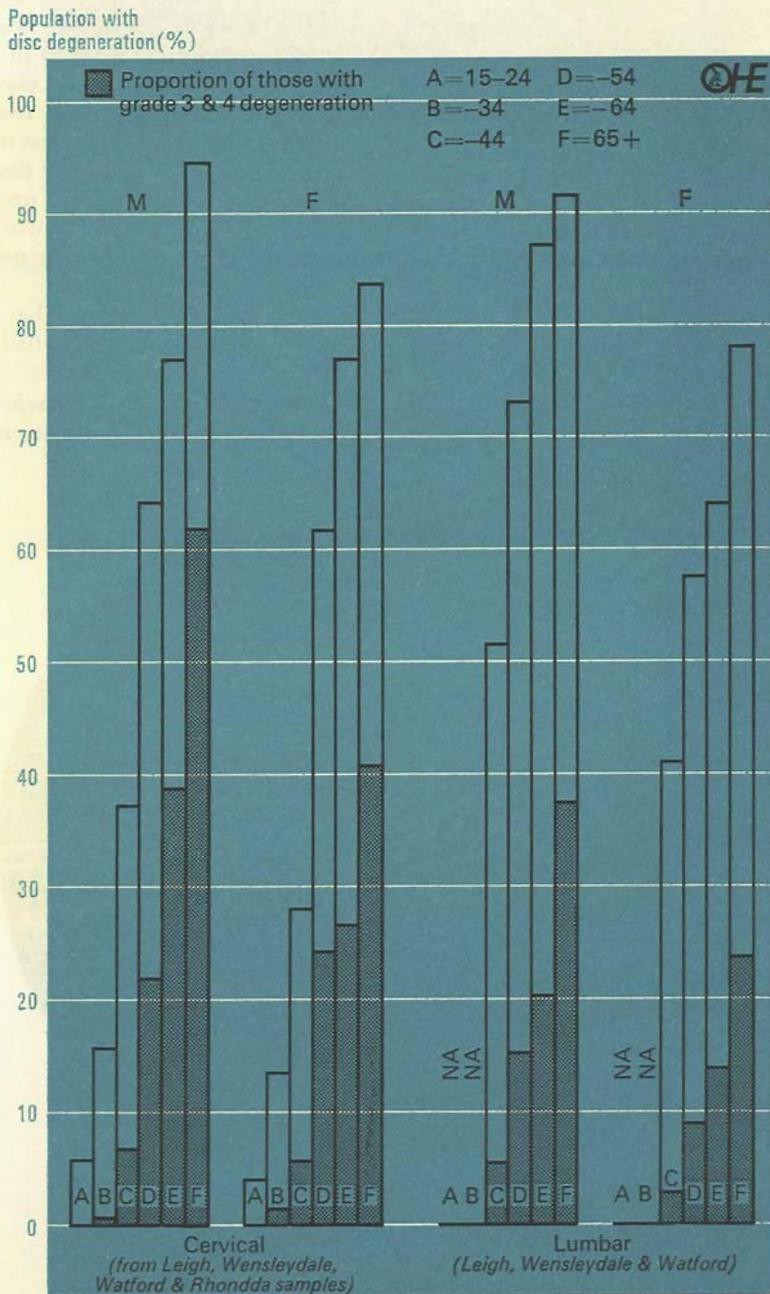
**Figure 1** *The prevalence of rheumatoid arthritis as defined by ARA criteria in NW England*

The prevalence  
of probable or  
definite RA (%)



Source (for figures 1 and 2) Lawrence 1969

**Figure 2** *The prevalence of radiological evidence of disc degeneration in Britain*

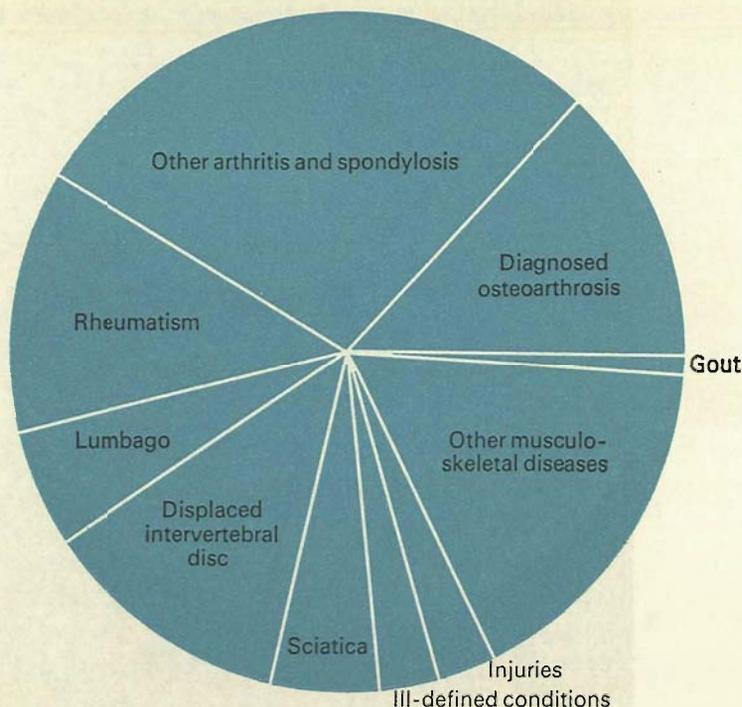


### Rheumatism in industry

In the period June 1970 to June 1971 the rheumatic diseases accounted for thirty six and a half million days of sickness absence, about 11.6 per cent of the total time lost. (See Figure 3.) In addition over one million days were lost as a result of rheumatic complaints caused by injuries at work or diseases classified as having an industrial cause (prescribed diseases). An example of these is beat (swollen) knee which is prevalent amongst miners at coal faces who have to kneel for long periods. Other diseases, such as the devitalising of bone and cartilage (aseptic necrosis) resulting in osteoarthritis, may be caused by factors at work but not always associated with occupational activity. Aseptic necrosis is common amongst compressed air (caisson) workers.

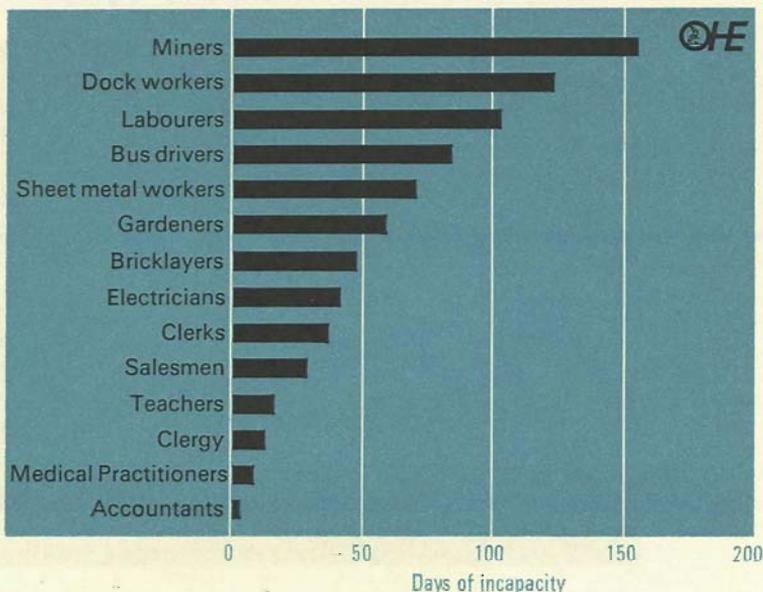
The Ministry of Pensions and National Insurance has published a detailed breakdown of the sickness absence statistics for

**Figure 3** *Absence from work due to sickness and industrial injuries attributable to rheumatic diseases. UK 1970-71 (males and females)*  
*Total: 37.5 million days*



Source DHSS 1972

**Figure 4a** *Days of incapacity from arthritis and rheumatism lost per 100 men at risk in United Kingdom during year ended June 1962*



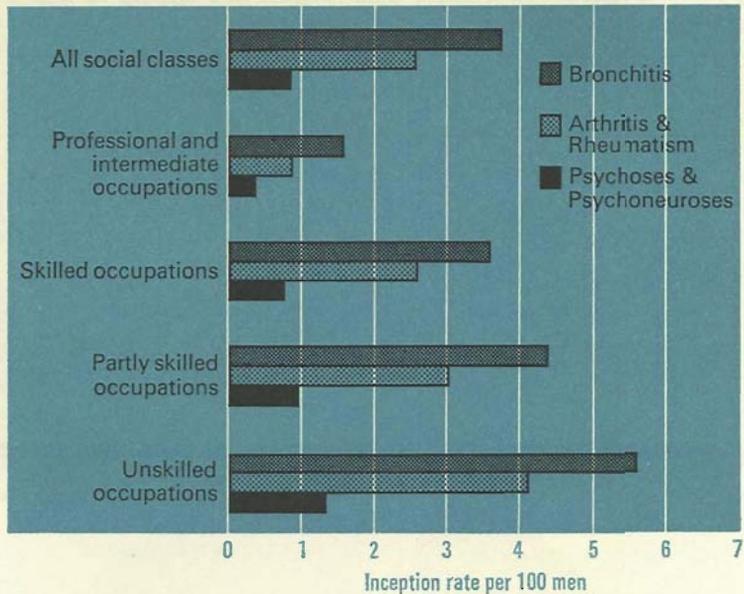
Source Ministry of Pensions and National Insurance 1965

the year ending June 1962, and Figures 4a and 4b are derived from these. Such figures are informative, although the complex of social factors underlying absences may distort the true prevalence of disability for work (OHE 1971).

More recently the Industrial Survey Unit of the Arthritis and Rheumatism Council has published the results of a number of detailed surveys on rheumatic complaints amongst men in industry. (See Table 3.) By far the most widespread disorder was found to be back pain which accounted for 50 per cent of all such diseases and 60 per cent of the time lost. Rheumatoid arthritis was reported to be less prevalent although in cases where it does occur the sufferers often leave industry altogether, removing themselves from the field of study.

The survey showed, as may be expected, a progressive increase in occurrence with age and also that certain types of work encouraged the development of rheumatic complaints. For instance, severe intervertebral disc disease was high amongst floor

**Figure 4b** *Inception rate per 100 due to arthritis and rheumatism in different social classes during year ending June 1962, compared with those from bronchitis and mental disorders*



Source Ministry of Pensions and National Insurance 1965

moulders in iron foundries, who have to adopt an abnormal posture whilst working and there was also a high rate of osteoarthritis in coal miners and dockers, both of whom are rather liable to injury with the possibility of secondary degenerative changes occurring in the affected joints.

The usual manner of presentation of sickness absence statistics does not show how much time is lost by back pain as a whole, some of it being included under headings such as osteoarthritis. Figure 5 estimates the full part played by back pain in industrial sickness.

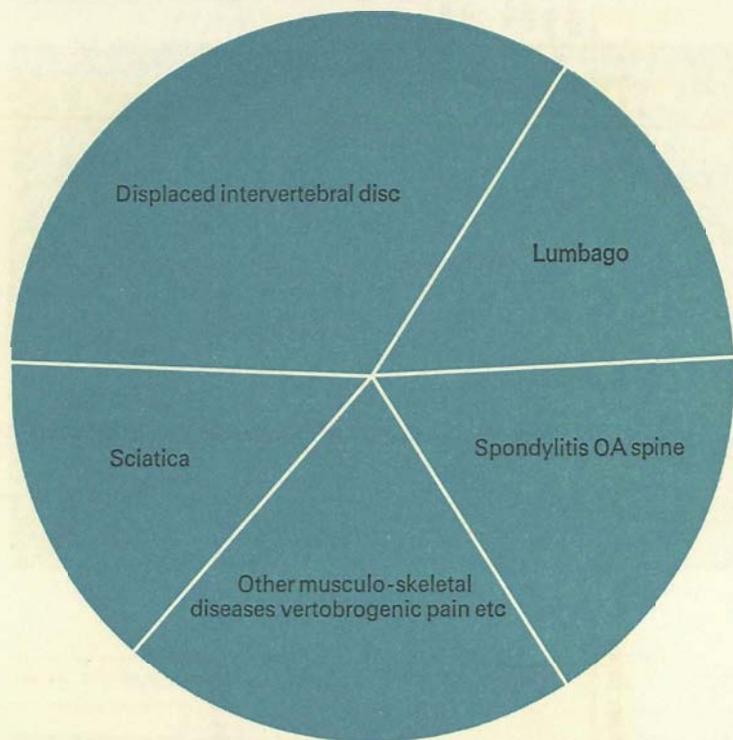
Researchers found that sufferers from chronic rheumatic diseases show, as would be expected, statistically more absence than non-arthritic workers, and that the excess of absence was attributable to rheumatic diseases themselves. This indicates that diagnoses of arthritis and rheumatism for sickness certification were in most cases specific rather than general terms of convenience (see Figure 6). The surveys revealed that a significant per-

**Table 3** *Rheumatic complaints and sickness absence in men over 25 years of age*

Occupation	No. in sample	Average age in years	Symptoms within 12 months of interview (rates per 100 interviewed)	Diagnosis on examination (rates per 100 examined)			Sickness absences within 12 months of interview (rates per 100 interviewed)
				Osteo-arthrosis	Definitive disc disease	Other rheumatic conditions	
Coal Miners	325	46.3	53	16	16	373	
Iron Foundry Workers	762	48.1	44	13.5	17	338	
Civil Dockers	206	47.4	43	21	14	374	
Naval Dockyard General duty men	339	45.7	43	9	14	235	
Naval Dockyard Craftsmen	822	45.8	42	8	12	280	
Brewery Workers	345	48.5	52	8	19	282	
Electronic Engineering Workers	164	43.0	41	6	15	60	
Civil Servants	183	43.8	42	9	16	157	

Source The Industrial Survey Unit of the Arthritis and Rheumatism Council

**Figure 5** *The painful back in sickness absence statistics 1970-71 (males and females) Total: 13.7 million days*



Sources Benn and Wood 1972 DHSS 1972

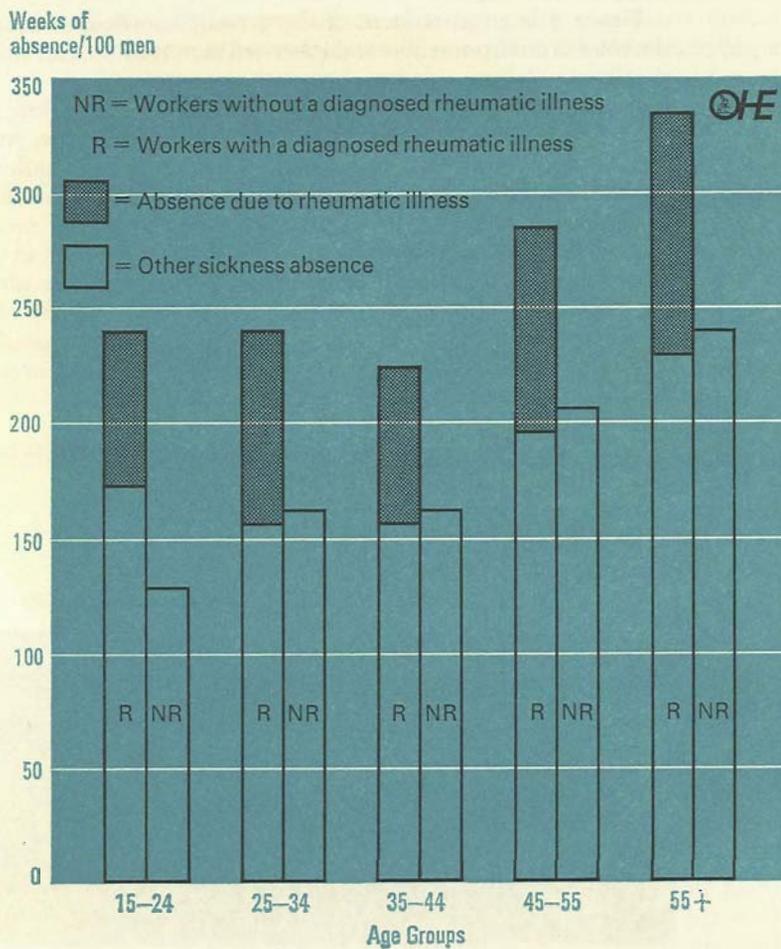
centage of those interviewed (over 4 per cent) had changed their occupation because of rheumatism, 53 per cent of them due to disc disease affecting the lumbar spine and 12 per cent because of less well defined back ache.

### **Familial occurrence**

Studies of the occurrence of a disease in families reveal the liability of a group of individuals in a given environment to contract a specific complaint. From such studies it is sometimes possible to derive estimates of the influence of inherited factors in the process of contracting diseases and also that of environmental ones.

However, it has been pointed out that the methodology available for the genetic analysis of chronic diseases of multiple causes

**Figure 6** Sickness absence for those with and without diagnosed rheumatic diseases



Source Anderson 1971

is very crude. More important, the results of such analyses are entirely at the mercy of how one defines the condition under study (Wood 1972b).

Figure 7 is an assessment of the present knowledge regarding the roles of environmental and inherited factors in the causation of rheumatic diseases.

Research into the influence of genetic factors will in time show the role that they play, but the question is very complex. At present concentration on the elucidation of environmental influences is more rewarding. Even though this part of the chain of disease causation might be limited it may still be amenable to intervention. Studies of twin populations are likely to be helpful in clarifying the role of environmental factors and may have already produced some interesting results. For example, a study of discordant<sup>1</sup> monozygous twins (Meyerowitz *et al.* 1968) produced results which support the hypothesis that psychological stress is a trigger for rheumatoid arthritis.

**Figure 7** *Spectrum of diseases indicating the relative casual significance of genetic and environmental factors*

Nature (genetic factors)		(environmental factors) Nurture			
Marfan's syndrome <sup>3</sup>					
Ehlers-danlos syndrome <sup>1</sup>	Ankylosing spondylitis	Rheumatoid arthritis	Rheumatic fever		
Hurler's syndrome <sup>2</sup>	Gout	Psoriasis		Osteo-arthrosis	Septic arthritis
Congenital dislocation of hip		Lupus erythematosus	Serum sickness		

#### Notes

1 Characterised by over elasticity and friability of the skin, excessive extensibility of the joints and fragility of the cutaneous blood vessels.

2 A congenital abnormality in the development of skeletal cartilage and bone.

3 A congenital eye disease.

Source Wood 1972

1 Possessing different health records.

### Climatic effects

An individual's experience of pain is heightened by cold. In cool climates, especially those where damp facilitates heat loss, there is thus a higher prevalence of symptomatic rheumatic disease than there is in warmer areas. This explains why, for example, a study of rheumatism and arthritis in Jamaica (Bremner *et al.* 1968) found that only about a third of the proportion of people who lose work from such complaints in Britain do so there,<sup>1</sup> although variations in the age structure of the populations and the nature of work in the different societies may to some extent explain these findings.

There is no evidence to indicate that the underlying prevalence of rheumatoid arthritis is influenced by latitude. However, in Heinola in Finland the frequency of osteoarthritis is the lowest recorded in Europe. Similarly Blumberg *et al.* (1961) found less radiological evidence of osteoarthritis in Alaska than in more southerly parts of America. There is no adequate explanation of these results. Lawrence (1969b) has suggested that there may be a longitudinal factor involved in the occurrence of rheumatoid arthritis, its prevalence being lower in Eastern Europe than in Western, although the statistics supporting this hypothesis appear weak. It is possible that the dryness of the air towards the centre of the Eurasian land mass has some effect in preventing heat loss.

### Handicap and distress

A simple statistical evaluation of the prevalence of the rheumatic diseases gives little reliable information regarding the degree of handicap and pain which they create. Firstly, conditions such as osteoarthritis are by no means homogenous entities and may cause highly variable effects amongst different sufferers, many of whom experience no distress at all (Lawrence 1969a). Also, different environmental conditions may modify the effects of similar symptoms. Thus an individual with constant joint pains who lives a life of fulfilling activity and has stable personal relationships may well be less affected than a similarly afflicted yet isolated and inactive person. The chronic rheumatic diseases are seen most frequently amongst the elderly, whose situation varies between societies and cultures. Hence the effects of these complaints can only be fully studied within the context of a particular social framework.

<sup>1</sup> The body's sensitivity to slight climatic changes may be sufficient to induce symptomatic interludes through the expectation of cold rather than its actual experience in some cases.

In Britain there are a number of indicators available which emphasise the disabling effects of these diseases. Thus in March 1972 of the 343,107 people on the local authority registers of handicapped persons 86,085 (25 per cent) suffered from arthritis or rheumatism: 64,464 (76 per cent) of these over sixty-five.<sup>1</sup> Similarly, 21,679 (26.6 per cent) of the 81,423 males and 4,805 (49.8 per cent) of the 9,640 females who are registered as disabled people by the Department of Employment suffer from rheumatic diseases (April 1972).

The best guide to the significance of the rheumatic diseases as a cause of handicap in this country is provided by the Government Social Survey's national survey on handicap and impairment (Harris *et al.* 1971). This survey relies on the respondents to report the diagnosis of their own complaints, which accounts for the high numbers in the non-specific groups in Table 4. Furthermore, only the major cause of disability was tabulated which probably led to the exclusion of individuals who suffer from arthritis as a secondary cause of disability.

Even so it provides good figures with which to assess the rheumatic diseases as a disabling factor in the national profile of handicap. The survey estimates that around three million people in Britain are impaired to some degree, one million of them to the degree of being handicapped by their impairments.<sup>2</sup> Of these, two thirds are over the age of sixty-five and two thirds are women. Harris estimates that 40 per cent of all handicap amongst the elderly has arthritis as its primary cause and over 25 per cent amongst those aged fifty to sixty-four. The corresponding figure is 24 per cent in the sixteen to forty-nine age group.

Whilst it must be emphasised that the prevalence of handicap, especially when related to cause, is entirely dependent on the parameters used in particular surveys it remains clear that the rheumatic diseases play a major role in the causation of disability. They also frequently aggravate the problems faced by those suffering from other complaints, particularly in the case of the elderly. Chronic rheumatic disease often brings years of misery both to those who suffer from it and to their relations who

<sup>1</sup> Numerous small scale surveys have shown the especial significance of these diseases amongst the elderly. For example, Age Concern (1972a) found that, in a sample of 597 old people, 55 per cent complained of the effects of arthritis and rheumatism. It should be noted that their sample was four years older than the national average for those over sixty-five and slightly weighted towards females, as well as being dependent on the respondent's knowledge of his or her condition.

<sup>2</sup> Harris and her colleagues define impairment as 'acking or having a defective limb or having a body defect which limits mobility, working or self care. Handicap is said to occur if impairments involve a loss of abilities vital to a subject's way of life.

**Table 4** *Persons of 16 years of age and over living in private households in Great Britain who are impaired by rheumatic diseases*

<i>Main causes of impairment</i>	<i>Men</i> <i>(thousands)</i>	<i>Women</i>
Sciatica	8.9	5.5
Rheumatoid arthritis	31	104
Osteoarthritis	38	103
Other and unspecified arthritis, and rheumatism (except lumbago)	130	465
Back troubles (lumbago, displacement of intervertebral disc, spinal curvature, backache)	35	30
Other diseases of bones and organs of movement	42	73
All rheumatic complaints	284.9	780.5

*Source* Harris 1971

have to endure the two sided burden of losing the companionship of a healthy relative and of having to care for an invalid. In terms of days of human pain caused, both physical and psychological, the rheumatic diseases probably cause more suffering than any other group of complaints.

Yet much of this suffering could be prevented or alleviated. Modern knowledge about treatment may relieve symptoms and prevent some disabling effects. And the good management of patients when extended into the fields of rehabilitation and social welfare may improve their experience of life greatly.

## *The treatment of the rheumatic diseases*

It has been frequently argued that the health services in Britain and most other developed Western nations are too greatly orientated towards the provision of sophisticated curative medicine at the expense of preventive medicine and services aimed at alleviating the discomfort of chronically sick and disabled people. Many contributory factors relating to both the social and economic structures and values within Western society may have promoted such an imbalance between 'cure' and 'care'. Comfort (1972) has suggested that it is because in modern society the prevention of death in all circumstances has come to be seen as the prime objective of medicine that health services aimed at improving the day-to-day quality of life have been relatively neglected.

The rheumatic diseases are Britain's most widespread chronic illnesses and are also the major single cause of physical handicap in this country. In view of the arguments expressed above regarding the services available for the treatment of such disorders the following sections of this paper examine particularly the role of preventive medicine in this field and also discuss some general aspects of the care of rheumatic patients which are sometimes considered to be outside the sphere of conventional health care.

### Preventive measures

Preventive medicine may be directed at two goals. First to reduce the incidence of disease and second to stop the development of disablements amongst diagnosed cases. The success of both depends largely on the identification of groups at particular risk.

It may be possible to reduce the incidence of some forms of osteoarthritis and back damage by persuading still healthy people to take care in certain situations, for example, when they are lifting heavy weights. Yet it seems improbable that generalised campaigns of this sort are of any great value although amongst particular groups, such as nurses who frequently have to lift patients, they can be effective. One worthwhile means of preventing cases of osteoarthritis is through the careful designing of products such as car seats in order to minimise the skeletal stress they cause. For example, adequate support for the head and neck may reduce the incidence of cervical osteoarthritis amongst people who frequently drive for long periods. Similarly seats tailored to fit the contours of each individual's spine have proved to be dramatically effective in reducing back pain amongst Royal Air Force pilots.

Most prevention in the case of the rheumatic diseases is of the second type, that of reducing handicapping effects and retarding the progress of the disease. For example, epidemiological studies have shown that many workers in industry have tasks likely to cause back strains and promote forms of secondary osteoarthritis and rheumatic diseases like bent knee or elbow. Adequate legislation designed to protect workers from having to subject themselves to such risks does not exist and it is likely that, even if it did, it would be very difficult to make it effective, not least because of people's own disregard for their future health. It is hoped that the new service established under the Employment Medical Advisory Service Act will contribute to the prevention of the development of unnecessary disablements at work, although doubts about this have been expressed because of the small size of the service and its separation from the main National Health

Service administration. If nothing else, adequate medical surveillance could reduce the incidence of symptomatic rheumatic disease amongst workers by advising individuals to move away from jobs if they are thought to be in danger of developing a complaint. By concentrating on those known to be at the highest risk, mainly middle aged males in heavy industrial occupations, the service may be maintained without undue cost. Its success in this area will of course depend on the efficiency of rehabilitative services and industrial replacement schemes.

To identify other groups at particular risk is more difficult. One can, for example, watch for signs of osteoarthritis in obese people<sup>1</sup> but even when it is detected it is often difficult to take effective action. Perhaps the most promising area outside industry is amongst school children. The detection of postural or slight skeletal defects amongst the young which could cause osteoarthritis in later life can lead to their remedy and hence to true prevention. If the routine school health examination included simple checks as to whether children have hyper-mobile joints or have noticed persistent 'clicking' in any part of their bodies over a significant period, some early cases of osteoarthritis could be found and action taken or, at least, advice about damaging activities given. For example, kicking footballs in a manner which twists the leg and strains the knee is very undesirable for some subjects, and cross-country running may damage the hips of others. Unsupervised weightlifting can be very damaging. Whilst it would clearly be impossible and also undesirable to limit the sports activities of all but those children at very great risk some obvious precautions are quite practical. In the case of football properly surfaced, even pitches may reduce the accidental twisting of joints and well designed boots may protect the foot and ankle. One potentially beneficial aspect of the new Employment Medical Advisory Service is that it will receive information from the schools service and so medical advice may be continued when individuals leave school and enter industry.

Prevention of the development of disabilities as a result of rheumatic diseases in more advanced stages may be achieved through the careful management of cases. One of the major advances in the treatment of rheumatic diseases since the Second World War is simply that patients are now rarely left to become immobilised in positions which are severely distorted and thus almost completely handicapping, as too often occurred in the past. Even if articular mobility is severely restricted there is a good

<sup>1</sup> This is not just simply a case of increased wear and tear because osteoarthritis is also found more frequently than in the rest of the population in the non weight bearing joints of obese people.

chance that patients may be rehabilitated successfully if they retain a basically sound posture, particularly if full use is made of modern aids to physical activity in cases where they are available. All important area of reform relates to the improvement in the supply of such aids in both administrative and economic terms.

Yet despite the fact that many cases of disabling handicap are being prevented many others, admittedly more minor ones, still do occur because cases are not managed adequately. For example, if it is fully explained to people with arthritic hands that they will retain their grip only if they hold their hands back on the wrist, so that the fingers are free to move, nearly all will try to do so, despite discomfort. If necessary a splint may be used to hold the hand in position at night. But quite often patients are not told to do this and hence lose the use of their hands. Such needless suffering can often be avoided by good case management on the part of the general practitioner.

### Differential diagnosis

It is often said that early diagnosis and treatment is of the utmost importance in the care of the rheumatic diseases. Certainly in the case of the 'collagen' diseases, which affect connective tissues in many parts of the body, this is so. Some, such as systemic lupus erithematosus, can kill but their progress may, in many cases, be retarded over long periods by the careful use of steroids and other immunosuppressive agents. Others, such as giant-cell arteritis, can be very effectively controlled by steroids (Hart 1972b). But in most cases it is more important to obtain an accurate rather than a particularly early differential diagnosis.

Diseases such as rheumatoid arthritis, osteoarthrosis, gout, ankylosing spondylitis and the infective arthropathies like tubercular or gonococcal arthritis (rare but increasing in prevalence) all demand very different treatment regimes and hence it is important not to confuse such conditions with each other. For example inflamed joints should not normally be moved but in cases of ankylosing spondylitis pain and stiffness are relieved by exercise and the joints must be kept mobile. An interesting side effect of the active behaviour encouraged in such cases is that patients suffering from ankylosing spondylitis very rarely get depressed, unlike patients suffering from other rheumatic diseases (Hart 1972a).<sup>1</sup>

Gout is of particular interest in that it is the only one of the

<sup>1</sup> The importance of preventive medicine applied to the psychological effects of rheumatic diseases cannot be overestimated. A robust and positive outlook on life may allow patients to enjoy life despite considerable physical illness.

rheumatic diseases which may be fully controlled by modern medicines. Because of the enthusiasm over this breakthrough there is now a danger of some practitioners over-diagnosing this disease, falsely associating a raised serum uric acid level with some other rheumatic symptom and believing it to be gout (Scott 1972c). The diagnosis should be established beyond doubt (ideally by crystal identification) before a patient is committed to long term treatment. Adequate use of diagnostic facilities must be made if the standards of differential diagnosis of rheumatic disease in general practice are to be held at the highest possible level.

The differential diagnosis and careful management of a rheumatic case can be time consuming and dull work. There are few short term results. Patients are often past middle age, near the end of their working lives and usually not in urgent need of treatment. They themselves often do not like to 'bother the doctor' with their symptoms. A recent survey (Dunnell and Cartwright 1972) found that about one sixth of the population still believe that medicine can do little or nothing to relieve the symptoms of arthritis and rheumatism. Other, more dramatic, cases constantly press for the practitioner's attention. The value of benefits which may accrue over perhaps half a lifetime are thus sometimes forgotten in the face of the more tangible problems of the day.

### **The role of medicines**

The pharmacological treatment of the rheumatic diseases is usually aimed at reducing pain and inflammation although in the case of gout and non-articular hyperuricaemia, discussed below, specific therapies are available. It is generally incorrect to suggest that the use of anti-inflammatory medicines has the effect of reducing the amount of actual physical damage caused by swelling in diseases such as rheumatoid arthritis but they may allow severely affected individuals a measure of independence in life which would otherwise be impossible.

The most effective anti-inflammatory agents are the corticosteroids and the corticotrophins. When they were introduced at the beginning of the 1950s hopes for the steroids' therapeutic value were very high but the disadvantages of long term steroid treatment soon became apparent. Undesired effects include facial mooning, bruising, osteoporosis and fracturing, gastric ulceration, the masking or aggravation of infections, cataracts, myopathy, hypertension and the retardation of growth in children. It has also been shown that the body's own steroid production is suppressed in corticosteroid treated patients, occasionally

for some time after the cessation of treatment, which leaves them lacking a normal response to sudden stress.

The use of corticotrophins may avoid some of these drawbacks although they have to be administered by intramuscular injection. However, it seems unlikely that the use of any one form of hormone treatment has decisive advantages and it is probably more important to emphasise the need for careful handling of dosage in steroid therapy (Scott 1972b). Despite their disadvantages the use of steroids has avoided much extreme suffering and individuals who would otherwise have been totally incapacitated have been allowed a measure of mobility and freedom from pain over significant periods of time.

The analgesics and non-steroid anti-inflammatory agents do not affect normal endocrine functioning (although they do affect some tests of endocrine functioning) and do not have such serious side effects although they may cause symptoms like nausea or gastric irritation. New products are constantly coming on to the market and preparations available for rheumatic illnesses have, over the past twenty or so years, vastly improved the care and physical condition of nearly all rheumatic patients.

Aspirin, together with heat,<sup>1</sup> is most frequently used in mild cases of rheumatic disease (Elder and Acheson 1970), having both anti-inflammatory and analgesic properties which probably result from its inhibition of the production of prostaglandins in the nervous system and other body tissues. Its virtue lies in its rapid effect and its disadvantages in its short action and gastro-intestinal side effects, although the techniques of microencapsulation together with enteric coating and new chemical modifications of the compound have helped to solve these problems.

Gold salts<sup>2</sup> have been used in the treatment of rheumatoid arthritis for over forty years, showing the best results amongst patients with active, progressive, erosive, sero-positive disease. This is the form of crippling rheumatoid arthritis which affects young children. Although the mode of action of gold salts is unknown controlled trials carried out in 1960 have shown them to be effective in many cases. However, gold therapy carries with it the constant risk of a toxic reaction although if a careful watch for warning signs is kept the dangers are small. The introduction of special gold treatment cards has proved a valuable safety precaution.

Most of the medicines presently used in the treatment of the rheumatic diseases have unwanted side effects, some of them

<sup>1</sup> Heat has analgesic properties due to its diminishing of the impulse conducting abilities of the nerves comprising the pain pathways.

<sup>2</sup> Sodium aurothiomalate is used in Britain today.

serious. For example, the long term use of salicylates may cause renal damage. It has been estimated (Wood 1972c) that about a quarter of all deaths from therapeutic misadventure result from treatments prescribed for rheumatic complaints, although the absolute number of such deaths is very small and often deaths only occur as the result of large doses well over the recommended limits being administered. This is so, for example, in most deaths resulting from the use of phenylbutazone.

Whilst our knowledge of the aetiology of most of these diseases is so limited it appears that the only field in which pharmacology will certainly advance in the near future is in the manufacture of more sophisticated anti-inflammatory and analgesic agents. However, an enhanced understanding of the mechanisms involved in rheumatoid disease could perhaps open the way to the curative use of immunosuppressive agents. Even today some patients do benefit from them. Similarly it is possible that specific means to stop the process of cartilage breakdown, in which enzyme activity is at least partially responsible, will be found once the true nature of the process is understood. Gout provides an outstanding example of how a fuller understanding of the causes of a disease may lead to its control. Not only can acute attacks be controlled by analgesic and anti-inflammatory agents but serum uric acid levels may, over the long term, be kept at acceptable levels through either increasing the rate of urate excretion with uricosuric compounds or by inhibiting xanthine oxidase activity, thus stopping urate synthesis and permitting deposits to be reabsorbed.

Finally psychotropic medicines have also helped in the treatment of rheumatic patients. Although in many cases the ideal treatment for patients is to cure the distressing elements in their social life, such as isolation and loneliness, which cause unhappiness and depression this is not always immediately possible. And depression caused by frustration through, for example, loss of physical ability, is always likely to occur. The increasingly effective antidepressants and tranquillisers may reduce this aspect of ill-health which in the past has often been accepted as inevitable. Their use may alleviate the clinical symptoms of mental illness so that the social and personal factors underlying an individual's distress may be more effectively combatted. Some of these medicines also raise the pain threshold of patients and thus reduce the experienced ill-effects of rheumatic complaints.

### **Physiotherapy**

A frequently encountered effect of rheumatic diseases is a reduction of joint stability due to the loss of co-ordination between the

muscles and ligaments which pull across them. Physiotherapy may be used to reduce such instability, mainly through the application of exercises and/or splintage which may maintain joint function and prevent deformity. In some cases manipulative techniques may also be of use. Functional retraining, for example regarding walking and posture, and advice about available physical aids helps individuals adjust to disablement in their every day lives.

The most important areas of debate regarding the use of physiotherapy centre on two main questions. First, what benefits are desired from the use of physiotherapy and can these be gained by some other less costly or elaborate means? For example, techniques such as short wave diathermy or massage are often used only to make patients feel that 'something is being done' for their condition. The use of scarce, highly skilled medical workers in this way is hard to justify. In some areas of physiotherapy there is a great need for the construction of suitable indicators of the value of therapies given.

The second area of debate relates to the structure of the services provided. For example, should physiotherapy be brought more into the area of the community health services and removed from its traditional hospital setting, particularly with regard to rehabilitation? What form should the relationship between the physiotherapist and the doctor take and how far should each professional group's authority extend? These questions look beyond the subject of the rheumatic diseases although the first will be discussed to some extent in the section on rehabilitation later in this paper.

Low back pain is the complaint for which physiotherapy is most frequently prescribed. The role of various techniques, especially manipulation, in treating this disorder is controversial. There is still a considerable need for research into the causes of back pain and on the nature of the spinal column itself, particularly when this is considered as a single dynamic entity rather than as a collection of individually studied parts. There is clearly psychological involvement in many cases of articular pain, particularly in the back. Anxious or depressed patients expressing their distress through such physical symptoms may well gain relief from the psychologically comforting attention given by practitioners of manipulation and massage. In a society where there is all too often no more pertinent help available this is perhaps desirable, although ideally it would be better to understand the patient's underlying problems. However, it would be extremely unwise to dismiss too many cases of back and other articular pain with no clear physical cause as being of psychiatric origin. In our present state of limited knowledge research free of

the constricting influences of established scientific and social prejudices is of central importance.

### **Surgery**

In rheumatoid arthritis the synovial tissue proliferates, damaging the joint and tendon mechanisms. The role of the surgeon is mainly to remove the proliferating membrane and to remedy, by reconstruction or excision, the effects of the damage caused. Ruptured tendons may be sutured and the pressure induced by proliferating synovia, which may cause ischaemia in the tendons, relieved. Where the disease involves the joints of the fingers or the knee the synovial tissue is cut away as far as is possible. Sometimes a diseased bursa or synovial tendon sheath may be completely removed. But the effectiveness of operations of this nature generally leaves much to be desired and they usually serve as merely a temporary point in the treatment of rheumatic disease. The alternative surgical treatments consist of fusing the joints into a fixed, stable position (arthrodesis) and the removal of the joint, with or without prosthetic replacement (arthroplasty).

These last two operations are also used in the surgical treatment of osteoarthritis, along with soft tissue operations such as denervation, used to relieve pain, joint clearance operations (cheilectomy) and the cutting and realignment of affected bones (osteotomy). Work is also being conducted on the development of transplant arthroplasty in which either the whole of, or cells from, the cartilage shell or the entire articular end of a bone may be grafted. These techniques are still in experimental stages and are beset by many practical difficulties, such as the problems of donor supply and of tissue rejection.

The applicability and value of various techniques depends very much on the joint affected. The most important advance made in the surgical treatment of rheumatic diseases has been the introduction of prosthetic replacements, particularly in severe cases of osteoarthritis of the hip. Total replacement arthroplasty applied to this joint has been pioneered in Britain. Although limitations on the durability of replacement joints and possible toxic effects still mean that they are used mainly in elderly patients this is one example of an area of arthritic disablement which can be dramatically relieved. However, it is not unusual for patients to have to wait two to three years for hip joint replacement operations which means that a significant proportion of the potential benefits of surgical intervention in such rheumatic cases is being lost. It is probable that the most effective means of reducing such waiting lists relate to the freeing of hospital resources by the extension of community care facilities, a point

discussed in the conclusion of this paper.

Current innovations in the construction of prostheses centre on developing new materials, for example high density polythene hip joints or silicone rubber prostheses for the knuckle joints of rheumatoid hands (Rhodes *et al.* 1972). The development of replacements for joints such as the knee which are more complicated than the simple ball and socket joints are still not very far advanced and there is as yet no prosthesis available for joints such as the ankle.

## *Costs of the rheumatic diseases*

The cost of any disease to a community can only be approximated for comparative purposes. Crude guidelines to the social and economic significance of a complaint are too often quoted as if they had some absolute value. In the case of the rheumatic diseases, where the intangible costs in terms of years of misery and lost potential are so great, caution when expressing the costs of disease in monetary terms is of particular value. Yet if society is going to direct its efforts towards the most rewarding goals all indicators available should be used, where relevant, to calculate priorities.

The tangible costs of diseases may be broken down into firstly the direct cost of medical and welfare services consumed because of it, secondly the indirect cost to the community in terms of lost production and lastly into their personal costs to patients and their families.

Table 5 shows estimates of the costs of the rheumatic diseases to the national health services. The hospital inpatient costs in 1970 were about £45-50 million or nearly one twentieth of the cost of the entire service.<sup>1</sup> Although small when compared with the estimated cost of mental illness to the hospital service, between £150-200 million, this proportion shows that the rheumatic complaints are a major factor in the country's health expenditure. Many patients, such as those described as suffering from senility, are also likely to have a rheumatic disease contributing to the reasons for their admittance to hospital, although the cost of services provided to them is not included in this estimate.

<sup>1</sup> The breakdown of hospital costs is based on figures from the report on the Hospital In-Patient Enquiry for 1960. Changes in therapeutic practice may well have caused changes in the underlying trends on which this estimate is based. Also, the classification 'diseases of the bones and organs of movement', on which the figures are based, includes only about three quarters of all rheumatic diseases (Anderson 1971).

**Table 5** *Cost of rheumatic diseases to the National Health Service - year 1969-70*

<i>Cost in millions - Rheumatic complaints</i>		<i>Total for sector</i>	<i>% of total</i>
Hospital inpatient cost (current)	45	976	4.6
General practice	11.9	174	6.8
Pharmaceutical services	14.5	209	8.8
Dental and ophthalmic services	0	131	0
Total	71.4	1490	4.8
Other health expenditure	NA	668	NA

*Source* OHE Estimates

Pharmaceutical expenditure on the rheumatic diseases by the NHS is estimated at over £14 million in 1970, a sum approaching one tenth of the total cost for all the pharmaceutical services. This is relatively high because patients frequently need prolonged medication. About half of all prescriptions for rheumatic disease are for medicines used exclusively for such complaints whilst the remainder are for more widely used analgesics.

Regarding general practice Logan and Cushion (1958) found that rheumatic complaints were the most prevalent cause of consultation amongst women and were second only to respiratory diseases amongst men. The difficulties of diagnosis and need for long term treatment mean that much of a general practitioner's time may be consumed by rheumatic cases yet this is probably unavoidable. The estimated cost for this service in 1970 is £12 million.

Looking at the NHS services as a whole the main avoidable expenditure takes place within the hospitals on elderly patients who could potentially be discharged but would have difficulty living in the community outside the hospital. This increases hospital costs. What is needed is the development of effective community welfare services. These would benefit the patients and relieve strain on the hospitals, although in the long run they may prove no less expensive if they are to be of any great value to their clients.

There exists little information on which to base an estimate of the current costs to the welfare services attributable directly to rheumatic disease. However, Harris *et al's* (1971) estimates of the prevalence of rheumatism and arthritis as a cause of impairment and handicap may act as an indicator of their social significance. The expansion of the social services is likely to prove expensive. Currently government expenditure on the local authority ser-

vices in England alone stands at about £270 million per annum (1972-73) and this figure is projected to rise to about £345 million by the period 1975-76 (1970 prices). Also personal payments by clients using social services are estimated to be running at about £40 million per annum (1972). However, if the welfare services are improved considerable savings to the NHS are probable.

The most commonly used indicators of lost production caused by diseases are derived from the sickness absence statistics. Over 11 per cent of all such absence may be attributed to rheumatic diseases, resulting in the expenditure of a little over £40 million in sickness benefit grants. In addition nearly £2 million is paid out annually in grants to those who have rheumatic complaints classified as industrial injuries or prescribed diseases. These sums are, of course, not costs but transfers of wealth within the economy. As with many other ailments there are also hidden costs to industry in that individuals may be forced to change their jobs by arthritis and thus costly skills are wasted even though the people concerned are not officially classified sick. Retraining adds further expense, both economically and in terms of human effort and distress. The price of sickness absence in terms of lost goods and services is likely to be far greater although the cost of lost days in an economy working at less than full production tends to be over-estimated. Also a certain amount of economic activity is itself generated by the presence of diseases in a society and by the payment of grants to the sick.

Personal costs such as pain or lost potential are largely intangible or incalculable. But it is worth noting that recent surveys have found that mild rheumatic disease is one of those conditions frequently treated by home medicines (Wadsworth *et al.* 1968).<sup>1</sup> Brotherston (1958) found that less than one half of patients consulted their doctors over mild back pains and only around one half to two thirds did so for complaints described as 'vague aches and pains' and rheumatism. In 1970 about £9 million was spent on medicines purchased without prescription for use in rheumatic cases. Of this about half was on preparations described as being specifically for rheumatism whilst the remainder was on mild analgesics. This is about 10 per cent of all non-prescription drug sales, another indicator of the importance of these diseases.

A final aspect of the costs of rheumatic diseases is the amount spent on research. This represents a cost in that resources are diverted from some other end but it must be remembered that

<sup>1</sup> In some cases, such as younger people who suffer from the occasional rheumatic pain, the existence of prescription charges makes it cheaper for them to buy medicines like aspirin privately (Dunnell and Cartwright 1972).

such work usually involves fundamental biological and chemical enquiries which might have been conducted even if the rheumatic diseases did not exist. It may lead to discoveries in fields other than medicine. Because of this the Medical Research Council does not break down statements of expenditure into what is spent specifically on rheumatic diseases. Similarly it is difficult to assess what proportion of the British pharmaceutical industry's £22 million research budget in 1971 was devoted to work on the rheumatic diseases, although the figure is likely to be quite considerable. The main clearly identifiable source of British research money in this field is the Arthritis and Rheumatism Council. Their 1973 budget is estimated at £510,000, most of which is devoted to medical and epidemiological research. They are particularly concentrating on rheumatoid arthritis where current interest in theories about its cause, for example that it is a derangement of the body's immune response caused by some as yet unidentified factor, has given rise to the hope that a cure, or means of prevention, may shortly be found. Recently increased interest has been shown in the problem of low back pain although the amount of research money available in this area is still relatively small.

## *Social problems and rheumatic diseases*

It would be misleading to over-emphasise the homogeneity of the personal and social effects of the rheumatic diseases. Nearly all these complaints cause reduced joint mobility and painful stiffness but the problems faced by a young victim of Still's disease are very different from those of an elderly person with rheumatoid arthritis. And a disabled father usually faces inherently different problems in trying to fulfil his commitments to his family than does a similarly afflicted mother.

For the purposes of discussion it is convenient to divide this topic into two broad headings. Firstly, there is the problem of disability as it relates to people of working age who have to readjust their lives to fulfil an existing pattern of expected behaviour such as the role of wage earner and father. This process may be described as rehabilitation. Secondly, there is the problem of disability amongst groups who have to face a change in their entire way of life. Some very disabled people of working age come into this category but mainly it is the elderly who are so affected.

Once they retire and their families become independent many old people find that the responsibilities and relationships which helped to structure their lives in past years have either considerably changed or have disappeared completely. This frequently results in inactivity and depression, particularly when the situation is exacerbated by a disabling disease like arthritis. The provision of a more desirable social and physical environment for groups such as the elderly chronically sick could be described as rehabilitation but such a service clearly differs in nature from, for example, industrial rehabilitation.

### Rehabilitation

Rehabilitation may be defined in such a way as to include all the processes of medical, surgical and prosthetic intervention available to maintain the physical abilities of rheumatic patients at the highest possible level. But perhaps a more workable use of the term confines its applicability to aiding the disabled to adjust to their changed physical condition after these interventions have taken place. Of course, in the case of progressive diseases such as rheumatoid arthritis this may involve a continuous process of modification of the patient's environment and behaviour for as long as he or she survives.

Broadly the field may be broken down into two areas, that of adjustment to home life and that of adjustment to work conditions. Individuals, depending on their condition, experience degrees of general difficulty in mobility coupled with specific problems of manipulation in given situations. The overall aim of rehabilitation is to give the patient the maximum independence possible in both spheres. In domestic life this may range from the fitting of special hand rails, hoists and washing appliances to providing convenient clothes to helping the patient to accept changes in his or her behaviour and the structure of his or her family resulting from the onset of disability. For example, the successful use of changed sexual techniques sometimes needed to overcome the physical problems caused by rheumatic diseases may require a new understanding in the relationship between husband and wife. Perhaps the most important advances in this area are that it is now socially acceptable to talk about sexual problems and that they are recognised as being of considerable importance.

Industrial rehabilitation in Britain began at the time of the Boer War when the Lord Roberts Workshops were established to give work to disabled soldiers. Provisions today stem from efforts during the Second World War to enlarge the industrial labour force by training the disabled, which gave rise to the 1944

Disabled Persons (Employment) Act. Today many courses are available at Industrial Rehabilitation Units, Government Training Centres and elsewhere to which patients may be sent by the Disablement Resettlement Officers after having been referred by hospitals, family doctors, unions and welfare services. Sheltered workshops exist for the more severely disabled, although the desirability of shutting off this group from the rest of the community may be questioned.

The DHSS report 'Rehabilitation' (known as the Tunbridge Report) has pointed to the need for improvement of the rehabilitation services, increased understanding of the difficulties involved and the extension of provisions within the health services to deal with them.

One significant problem is that, at the moment, liaison between the doctors in the medical services controlled by the DHSS and the Disablement Officers employed by the Department of Employment is inadequate. The chief reason for this is that even now most undergraduate medical school courses involve no formal training in the field of rehabilitation and doctors have been unaware of both their patients' problems and the services available to help them. An important recommendation in the DHSS report is that medical students' training should be extended in this sphere. It is hoped that the Department of Employment's new medical advisory service will improve liaison in the field of rehabilitation and disablement resettlement and also point out ways to improve the services provided. However, fears have been expressed that this new service will prove ineffective. One reason for this belief is that the Department of Employment sometimes appears to underestimate the value of preventive medicine in this field, seeing medical services as essentially curative.

The Department of Employment is aware of the need to reorganise its industrial rehabilitation services so that they may be closely linked with the patients' receiving of specialist medical care. This will enable those affected by rheumatic diseases and other disabling complaints or injuries to return to work more swiftly than at present and to avoid distressing breaks between the end of medical care and the start of rehabilitation. The development of comprehensive centres which link the services with the Department of Health and Social Security and those of the Department of Employment are an advance in this sphere. The first of these opened in 1968.

The chief criticism of the structure and planning of the nation's present rehabilitative facilities is that, on the side of health care, they are dominated by hospital based medicine and that they do not extend sufficiently to help individuals in their day-to-day lives

in the community. Certainly the Tunbridge report appears to justify such criticisms for it discusses the process of rehabilitation largely from the viewpoint of the hospital services. If individual's such as those disabled with arthritis are to be helped to lead as active a life as possible it is in their normal surroundings, in the home, the work place and in the community as a whole<sup>1</sup> that help in terms of retraining and readjustment to changed conditions must be provided.

The basic issues involved may be expressed simply in sociological terms. When a person is termed 'sick' this usually involves their being relieved from their everyday duties and responsibilities. Although it may be therapeutic for an acutely ill person to be free from his or her normal social role a chronically ill or disabled individual is in a different situation. The handicapped need a reconstructed place in society which they may fulfil despite their disabilities. To ascribe to them the status of sickness as it is normally applied to the acutely ill can be actively damaging.

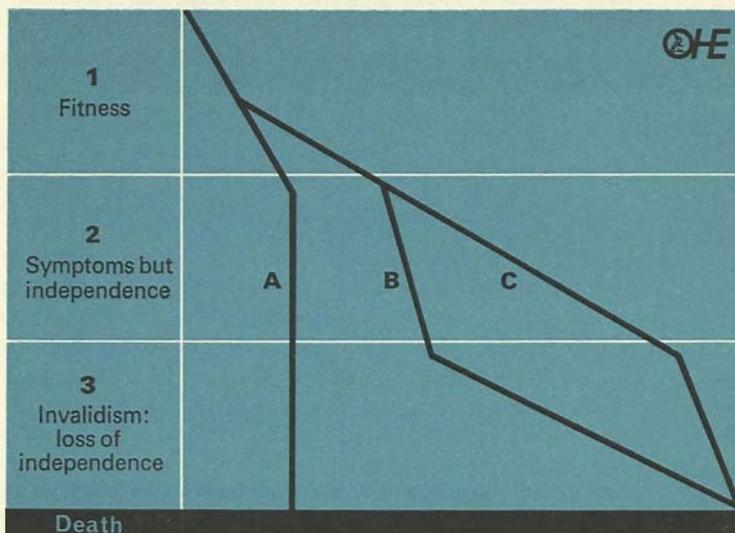
The major part of any rehabilitative process is thus social rather than medical in conventional terms. Acceptance of the implications of this argument by the professional groups at present dominant in the field of rehabilitation will probably be the key to the development of much needed services in the community rather than in hospitals.

### Rheumatism amongst the elderly

About 40 per cent of all reported handicap<sup>2</sup> amongst people over working age is caused by rheumatic diseases. The majority of old people suffer from some rheumatic symptoms which result chiefly in a loss of mobility. This can make independent life very difficult and it often gives rise to isolation and loneliness. Particular problems, such as that of heating, occur. Although special financial provisions designed to ensure that old people need not suffer from cold exist there is a major problem in distributing these benefits (Age Concern 1972a). A recent survey found that less than one tenth of elderly people in London knew of such grants (Task Force 1972). In the case of the rheumatic diseases this problem is especially important because cold often aggravates their painful symptoms.

<sup>1</sup> The term 'community care' is frequently avoided because it is often too vague to be useful. For the purposes of this paper 'community care' may be taken to refer to the delivery of specialist health care (for example some forms of physiotherapy) to individuals in such a way that they are simultaneously encouraged and enabled to adopt a way of life comparable with that of other healthy and content members of society. It is a combination of specialist and general skills.

<sup>2</sup> See footnote 2 on page 20.

**Figure 8** *Independence and invalidism in old age*

Source Elliot 1972

Generally the rheumatic diseases exaggerate all the problems faced by ageing individuals. But in specific situations they may introduce new complications. For example, a severely distorted hand may result in psychological distress on the part of the patient caused by a sense of abnormality and disfigurement in addition to an awareness of loss of manipulative ability.

The well being of elderly patients suffering from this widespread group of diseases is dependent on a combination of medical and social care. Elliot (1972) has expressed the basic issues involved diagrammatically, as shown in Figure 8. Although he was concerned with the chronically sick elderly as a whole his model fits the specific case of rheumatism and arthritis amongst the aged equally well.

Line A describes the pattern of illness typical before the development of modern medicine. The loss of good health was followed by relatively short periods of symptomatic illness and invalidism leading to death usually through supervening infections like pneumonia. Line B traces the experience of many of the elderly in our society at present. Loss of health is followed by a swift decline into a period of protracted invalidism during which life is frequently unpleasant and the unfortunate sufferers repre-

sent a heavy burden on the community, consuming much expensive hospital care. Line C represents an idealised situation. Sufferers from symptomatic chronic illnesses, such as the rheumatic diseases, retain as much independence as possible in a supportive environment. The resources in society available for the care of the elderly are directed mainly to this end instead of being used to finance expensive facilities which serve only to keep alive those very near to death. Hence the period of semi-independence is extended and the onset of total invalidism is followed comparatively swiftly by death.

At the present time the welfare services available to many of the elderly are very limited. This point may be illustrated by the findings of a survey in a seaside town in 1971 (Cresswell and Pasker 1972) on the structure of community care amongst the elderly. They found that three quarters of elderly, highly dependent people were cared for entirely by members of the household in which they lived with no outside contacts at all and that about one quarter were cared for by individuals almost as frail as themselves. In short, community care played little or no part in the care of the chronically sick elderly people that they studied. A corollary of this is that many old people are in hospital or hospital-like old people's homes because no suitable care is available for them outside the totally protected environment.

Currently interest in the concept of semi-sheltered communities for the elderly and disabled has been increasing. In this area an important contribution could be made through the increased provision of grouped warden serviced flatlets (Isaacs *et al.* 1972, Age Concern 1972b). These may go some considerable way towards the creation of an environment in which frail old people may experience independence, particularly if they begin occupying these houses relatively young. To achieve this end, links with children and the world in general must of course be maintained and enhanced rather than impaired. The degree to which this may be achieved by people living within such communities is, however, a matter of some debate. And it may be argued that the gathering together of individuals whose only common characteristic is their age is not particularly desirable.

The recent introduction of attendance allowances is one important measure which may enable the families of some of the elderly handicapped by rheumatism to care for them, particularly as the conditions for payment of the grant at the reduced rate of £3.60 a week are to be extended to include those who do not require constant night as well as day attendance. But here again a problem arises in that many elderly people do not have relatives who are either able or prepared to care for them in

their homes and the life of an old person who is often unnecessarily dependent on close relatives has many disadvantages for all those involved.

It appears probable that the future care of the majority of the old and partially disabled will hinge on the development of a base of generalised community care which may be supplemented by the specialised efforts of the medical services. At present this does not exist in an adequate form. It is also probable that a significant step towards its creation would be achieved if the local authority social service departments were to become responsible for the general welfare of all the elderly and for liaison between the medical and other services. An overall co-ordinating agency is badly needed, even between the hospital and community health services. For example, a recent survey (Gilhorne and Newell 1972) found that over two thirds of the general practitioners of elderly patients discharged from hospital were either not informed or informed retrospectively of their patients discharge. Less than one in five of the patients interviewed said that they had seen a medical social worker.

The information gathered in this paper indicates that the symptoms and disabilities caused by rheumatic complaints often vary with changes in the living conditions of those affected by them. For instance, it is of particular relevance to the elderly that depression and/or physical cold (both of which are often related to isolation and inactivity) may exaggerate the physical distress and handicap resulting from arthritis. Until the majority of the population past what is today retirement age have the chance of a more desirable way of life than is at present available to them it will not be possible to judge accurately how much of the loss of independence stemming from the degenerative disorders of old age is inevitable. If the elderly are encouraged and enabled to work as normal adults at jobs that are clearly useful to the community much apparently unavoidable handicap might be eliminated and the demand for expensive institutional and social care reduced.

## *Conclusion*

There is considerable hope that the amount of disability caused by rheumatism and arthritis in Britain will be reduced in the future through advances in treatment. New medicines and surgical techniques coupled with an increased emphasis on preventive medicine will make this possible. It is probable that

effective cures for some diseases, like rheumatoid arthritis, will be found. The advances made over the last twenty years such as the use of steroids and other anti-inflammatory agents and the development of artificial hip joints have already contributed to a significant improvement in the lives of many people affected by rheumatic diseases. The emergence of rheumatology as a recognised speciality within the framework of general internal medicine in recent years has also led to improvements in therapeutic practice, despite regional imbalances (Wood 1971).

Rheumatism and arthritis amongst people of working age will probably become a less pressing problem as the rehabilitative and occupational health services improve. In this context the foundation of the Employment Medical Advisory Service is an encouraging indication of the possibility of innovation. But diseases of the musculo-skeletal system are and will continue to be a major burden for all but the youngest age groups in Britain. Fundamental improvements in 'caring' services extending far beyond hospital based specialist medicine must be achieved before the problems of groups such as the partially handicapped elderly arthritics can be significantly alleviated.

The effects of the rheumatic diseases on those who suffer from them are influenced by social and psychological factors as well as by the more obvious physical mechanisms involved. Advances in the treatment of chronic conditions of this type rest on the patient being seen as an individual in the context of his or her particular social and economic environment. Improvements in the structure of the social services coupled with an increased efficiency in their liaison with the medical system are likely to produce the most significant innovations in this area of health care during the coming decade.

An important corollary to the improvement of community welfare services will be found in the field of hospital care. At present some of the potential benefits of surgical intervention in rheumatic cases are lost because of long waiting lists. It has been argued (OHE 1970) that the injection of further resources into hospital building and services will probably merely increase the demand for hospital care and direct the health care system itself to ends other than the revealed needs of the community. Improvement of community health and welfare services may greatly reduce the demand for hospital care and so free beds for worthwhile use in the most economical and productive way.

- 1. Arthritis caused by specific infection**
  - a* Pyogenic arthritis
    - 1 Staphylococcus
    - 2 Streptococcus
    - 3 Pneumococcus
    - 4 Gonococcus
    - 5 Meningococcus
    - 6 Salmonella
  - b* Tuberculosis
    - 1 Arthritis
    - 2 Spondylitis (Pott's disease)
  - c* Syphilis
    - 1 Congenital (Clutton's joints)
    - 2 Acquired (secondary or tertiary)
  - d* Viral
    - 1 Rubella
    - 2 Mumps
  - e* Less-common infectious arthrides
    - 1 Bacterial
    - 2 Rickettsial
    - 3 Fungal
    - 4 Parasitic
    - 5 Viral
- 2. Arthritis possibly caused by specific infection: Reiter's syndrome**
- 3. Arthritis as a sequel to specific infection: rheumatic fever**
- 4. Arthritis caused by hypersensitivity to foreign agent**
  - a* Drug reactions
  - b* Serum sickness
  - c* Anaphylactoid purpura
- 5. Arthritis in widespread inflammatory disease, cause unknown**
  - a* Rheumatoid arthritis and variants
    - 1 Adult peripheral type
    - 2 Juvenile rheumatoid arthritis (Still's disease)
    - 3 Felty's syndrome
    - 4 Sjögren's syndrome
    - 5 Caplan's syndrome
  - b* 'Connective tissue' or 'collagen' diseases
    - 1 Systemic lupus erythematosus
    - 2 Polyarteritis (periarteritis nodosa)
    - 3 Systemic sclerosis (scleroderma)
    - 4 Dermatomyositis, polymyositis
- c* Granulomatous reactions
  - 1 Sarcoidosis
  - 2 Erythema nodosum
- d* Others
  - 1 Ankylosing spondylitis
  - 2 Psoriatic arthritis
  - 3 Arthritis of ulcerative colitis, regional ileitis, and Whipple's disease
  - 4 Familial Mediterranean fever
- 6. Arthritis caused by metabolic or endocrine disorders**
  - a* Gout
  - b* Hyperparathyroidism
  - c* Ochronosis
  - d* Acromegaly
  - e* Hypothyroidism
  - f* Agammaglobulinemia
  - g* Haemophilia
  - h* Haemoglobinopathies
  - i* Haemochromatosis
  - j* Gaucher's disease
  - k* Scurvy
- 7. Degenerative joint disease (osteoarthritis)**
  - a* Generalised
  - b* Localised
    - 1 Hereditary (such as Heberden's nodes)
    - 2 Secondary to previous trauma or infection
    - 3 Secondary to faulty body mechanics
- 8. Arthritis caused by trauma to joints**
  - a* Direct trauma
  - b* Internal mechanical derangement of joint
- 9. Neurogenic arthropathy (Charcot's joint)**
  - a* Tabes dorsalis
  - b* Syringomyelia
  - c* Neuropathy of diabetes mellitus
  - d* Peripheral nerve injuries
  - e* Leprosy
- 10. Arthritis caused by bleeding into joints**
  - a* Direct trauma
  - b* Disorders of blood coagulation: haemophilia and variants

**11. Neoplasms**

- a Synovioma
- b Pigmented villonodular synovitis
- c Giant-cell tumor of tendon sheath
- d Leukemia
- e Multiple myeloma
- f Metastatic

**12. Hypertrophic osteoarthropathy****13. Arthritis secondary to lesions of bone**

- a Aseptic necrosis of bone
  - 1 Primary, of unknown cause
  - 2 Secondary to
    - a. Trauma
    - b. Vascular occlusion
- b Neoplasms of bone
  - 1 Primary
  - 2 Metastatic to bone
- c Osteochondromatosis
- d Osteochondritis dissecans
- e Endocrine diseases of bone

**14. Miscellaneous**

- a Shoulder-hand syndrome
- b Chondrocalcinosis (pseudogout)
- c Relapsing polychondritis
- d Behcet's syndrome
- e Polymyalgia rheumatica
- f Erythema multiforme
- g Reticulohistiocytosis of joints
- h Tietze's syndrome
- i Psychogenic rheumatism (hysterical 'arthritis')

**15. Para-articular conditions ('nonarticular rheumatism')**

- a 'Fibrositis'
- b Tendinitis and peritendinitis (bursitis)
- c Tenosynovitis
- d Tendon sheath cyst (ganglion)
- e Myositis
- f Neuritis
- g Carpal tunnel syndrome
- h Panniculitis
- i Intervertebral disk syndromes

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Source American Rheumatism Association

## References

- Age Concern on Pensioner Incomes. (1971)
- Age Concern on Health. (1972a)
- Age Concern. The role of the warden in grouped housing. (1972b)
- Anderson J A D Rheumatism in Industry. *Brit J Ind Med* (1971)
- Arthritis and Rheumatism Council
- Statistical Appendices Nos 1-4 (1969-72)
- Rheumatism in Industry.
- The Long Pain. (1972)
- Marriage, Sex and Arthritis. (1972)
- Collected reports on the rheumatic diseases. (1971)
- Physiotherapy in Rheumatic Disorders. (1972)

- Benn R T & Wood P H N The painful back in morbidity statistics. (Lecture 1972)
- Bennett P H & Wood P H N (Eds) Population studies of the rheumatic diseases. (1968)
- Blumberg B S, Bloch K J, Black R L *Arthritis and Rheumatism* 4, 325 (1961)
- Bremner J M, Lawrence J S, Miall W E *Ann Rheum Dis* 27, 326 (1968)
- Brotherston J H F in Recent Studies in Epidemiology, Eds Pemberton and Willard, Oxford (1958)
- Brooks R G Cost benefit analysis of patients treated at a rheumatic centre. *Ann Rheum Dis* 28, 655 (1969)
- Bywaters E G L Gout. *Teach-in* (May 1972)
- Comfort A What is a doctor? *Lancet* 971 (1972)
- Copeman W S C (Ed.) Textbook of the Rheumatic Diseases. 4th Ed. (1969) Livingstone
- Cresswell S & Pasker P The frail who lead the frail. *New Society* (27/5/72)
- Currey H L F Personal Communication. (1972)
- Dunnell K & Cartwright A Medicine Takers, Prescribers and Hoarders. (1972) Routledge and Kegan Paul
- Elder R & Acheson R M 'Social class and behaviour in response to symptoms of osteoarthritis'. *Millbank Memorial Fund Quarterly* Vol. XLVIII No. 4 (1970)
- Elliot C G Instant Medicine for the Elderly. *World Medicine* (5/1/72)
- Gilhome K R & Newell D J Problems and progress in medical care. (1972) Oxford University Press
- Hamilton A The rehabilitation of patients with rheumatoid arthritis. *Rehabilitation* No 82 (April 1972)
- Harris A I, Cox E, Smith C R W Handicapped and Impaired in Britain. (1971) HMSO
- Hart F Dudley & Huskisson E C Pain Patterns in the Rheumatic Disorders. *Brit Med J* Vol 4 No 5834 (1972a)
- Hart F Dudley The Treatment of the Rheumatic Diseases. (Lecture 1972b)
- Hawkins C F Social and Industrial Aspects of Rheumatic Diseases. In 'Textbook of the Rheumatic Diseases'. Ed. Copeman (1969) Livingstone
- Hazell K Personal Communication. (1972)

- HMSO Rehabilitation. (1972)
- Huskisson E C & Hart F Dudley Pain Threshold and Arthritis. *Brit Med J* Vol 4 No 5834 (1972)
- Isaacs B, Livingstone M, Neville Y Survival of the Unfittest. (1972) Routledge and Kegan Paul
- Kellgren J H Pain. In 'Textbook of the Rheumatic Diseases'. Ed. Copeman (1969) Livingstone
- Klein R & Ashley J Old Age and Health. *New Society* (6/1/72)
- Lawrence J S *Ann Rheum Dis* 20, 11 (1961)
- Lawrence J S *Ann Rheum Dis* 25, 425 (1966)
- Lawrence J S *Ann Rheum Dis* 28, 121 (1969a)
- Lawrence J S Heberden Oration. (1969b)
- Logan W P D & Cushion A A Morbidity Statistics from General Practice, Vol 1, General Register Office. HMSO (1958)
- Mason R M Personal Communication (1972)
- Mason R M & Currey H L F (Eds) Introduction to Clinical Rheumatology. (1970) Pitman Medical Press
- Meyerowitz S, Jacox R F, Hess D W *Ann Rheum Dis* 21, 79 (1968)
- OHE Building for Health (1970)
- OHE Off Sick (1971)
- Pasker P & Ashley J S A The Inter-relationship of sectors of the health and social services system. *Community Medicine* (12/11/71)
- Rhodes K, Jeffs J V, Scott J T Experience with silastic prostheses in rheumatoid hands. *Ann Rheum Dis* 31, 2 (1972)
- Scott J T Hyperuricaemia and the treatment of gout. *Teach-in* (July 1972a)
- Scott J T Personal Communication.
- Scott J T The use of steroids in the treatment of rheumatic diseases. *Practitioner* (1972b)
- Scott J T Personal Communication (1972c)
- Wadsworth M E S, Blaney R, Butterfield W J H Health and Sickness; the Choice of Treatment. (1971) Tavistock Publications Task Force. Old and Cold in Islington (1972)
- Wood P H N Rheumatic complaints. *Brit Med Bulletin* 27, 1 (1971)
- Wood P H N Conceptual Fallacies in health planning. (Lecture 1972a)
- Wood P H N The familial incidence of rheumatic disease (1972b)
- Wood P H N Personal Communication (1972c)

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