

ACTA DERMATO-VENEREOLOGICA
VOL. 53 SUPPLEMENTUM 72

FROM THE DEPARTMENT OF DERMATOLOGY, KAROLINSKA SJUKHUSET, AND
THE INSTITUTE OF SOCIAL MEDICINE, KAROLINSKA INSTITUTET, STOCKHOLM

PSORIASIS

A study of the course and degree of severity, joint involvement,
socio-medical conditions, general morbidity and influences of
selection factors among previously hospitalized psoriatics

by

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STOCKHOLM 1973

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The planning of this investigation was started in the spring of 1969. The work of going through ten years' case records in the archives of the Departments of Dermatology at the Karolinska Sjukhuset, St. Görans Sjukhus and Södersjukhuset, Stockholm, was done in the autumn of 1969. During the spring of 1970 the selected psoriatic patients were traced by means of the data unit at the Stockholm County Council, and of the registers of Regional Social Insurance Offices and parish authorities throughout the country. Further, from the registers of the Regional Social Insurance Offices, control persons matched to the psoriatic patients were selected. With the permission of the National Social Insurance Board, the Regional Social Insurance Offices provided information concerning the psoriatics and controls.

Construction of the questionnaire used was started in the autumn of 1969 and it was first tested in the spring of 1970. A second test was made during the spring and early summer of 1970.

The first requests for participation in the investigation were sent out in September 1970, and the first psoriatics came for investigation in October 1970; the last came in August 1971.

The investigation was first published as a thesis in Swedish in September 1972.

Financial support for the investigation was given by the Karolinska Institutets Fund for Undergraduate Research Workers and for computer time, the Edward Welander Foundation, the Swedish Psoriasis Association and the Linköping local division of the Swedish Psoriasis Association.

CONTENTS

PREFACE	3	E. Osteoarthrosis and psoriasis ..	61
I. INTRODUCTION	7	F. Is psoriatic arthritis a form of rheumatoid arthritis?	62
II. MATERIAL		G. Is psoriatic sacro-iliitis a form of pelvo-spondylitis?	64
A. The psoriasis material	9	VI. SOCIO-MEDICAL CONDITIONS IN PSORIASIS	
B. The control material	11	A. Family and housing situations	69
III. METHODS		B. Educational and employment situations	74
A. Case history of psoriatics	15	C. Financial situation	79
B. Physical examination of psori- atics	17	D. Summary and discussion of the social situation	82
C. Roentgenological examination of psoriatics	19	VII. GENERAL MORBIDITY	
D. Laboratory investigations	21	A. Sick leave	85
E. Register data	22	B. Previous and present state of health	91
F. Information concerning the control groups	23	C. Do psoriatics have a higher morbidity than other persons? 100	
G. Statistical methods	23	VIII. GENERAL DISCUSSION	
IV. COURSE AND DEGREE OF SEVERITY OF THE PSORIASIS		A. Aspects of selection factors ..	101
A. Age at onset, duration and familial occurrence	25	B. Interpretation of the results ..	104
B. Severity of the course of the psoriasis	27	IX. SUMMARY AND CONCLUS- IONS	111
C. Psoriatic lesions at the follow- up	32	APPENDIX I: Abbreviations ..	113
D. Discussion	35	APPENDIX II: The questionnaire	113
V. JOINT INVOLVEMENT IN PSORIASIS		APPENDIX III: Division into social classes	118
A. Psoriatic arthritis — nosologi- cal aspects	37	APPENDIX IV: Numerical values of the variables	118
B. Joint symptoms in general in the investigated psoriatics ..	40	APPENDIX V: Non-participation analysis	119
C. Psoriatic arthritis	42	REFERENCES	121
D. Clinical non-arthritic joint in- volvement	59		



I. INTRODUCTION

General background

Psoriasis is one of the most common skin diseases and 150,000—200,000 Swedes are estimated to have this affection (58).

Psoriasis may have its onset at any age, including infancy and at late ages, but it is most usually manifested during the second and third decades of life.

Psoriasis is an erythroscamous disease, i. e. its typical lesions are erythematous, exfoliative patches of varying size, ranging from small guttate lesions to large confluent eruptions sometimes covering the greater part of the body.

The cause is still largely unknown. Hereditary factors are involved, though the heredity is not clear. It has been considered by some authors to be dominant autosomal with incomplete penetrance, and by others recessive, or multifactorial (90, 119, 130, 144).

The psoriatic lesions may occur on any parts of the body, but certain areas are more susceptible than others, e. g. the extensor aspects of the arms and legs, especially the elbows and knees, and the lumbosacral region, the scalp and the nails.

The disease often has an unpredictable course. In some individuals it may be completely absent at times, while in others it is present continuously for several decades.

Despite the great variation in its morphology and course, nosologically psoriasis is regarded as a disease entity.

The present problems

It is an aim in different fields of medicine to arrive at standardized criteria and grad-

ations for various diseases in order to allow comparisons between the results of different investigations. Some attempts in this direction have been made for psoriasis (38, 41, 90, 119, 125), but no general agreement has been reached in this respect.

The only disease with which psoriasis is definitely associated is arthritis. There has been much discussion as to whether there is a distinctive form of arthritis peculiar to psoriasis or whether there is a question of a simultaneous occurrence of psoriasis and rheumatoid arthritis. During the last decade the concept of a psoriatic arthritis, distinct from rheumatoid arthritis, has been predominant (10, 72, 153, 154), but this has again been questioned and repudiated (28).

A chronic disease — even though it has periods of remission in many cases — which in addition often has its onset at an early age and is frequently difficult to hide, may strongly influence the life of the afflicted person and his relationship with his environment. His family life, education, occupation and financial situation may be affected. In Sweden investigations have been made of the socio-medical conditions of persons with various chronic diseases. Psoriasis, however, one of our most common chronic affections, has not previously been the subject of such systematic study.

Psoriasis has been described as a disease of the healthy, and it is a widespread opinion that persons with this disorder, even when it is relatively extensive, have otherwise good physical health (63). No systematic investigation of this concept has been made, however.

Aim of the investigation

The aim of this investigation was to study:

1. the possibility of grading the severity of psoriasis in clinically and epidemiologically applicable terms,
2. the joint involvement in psoriasis; its nature and its relationship to psoriasis and to the severity of the disease,
3. the socio-medical conditions in psoriatics in relation to the severity of the disease,
4. the general morbidity in psoriatics in relation to the severity of the disease.

II. MATERIAL

A. THE PSORIASIS MATERIAL

Choice of material

The investigation was planned to concern Swedish citizens resident in the Stockholm region. In order to study the problems upon which the investigation was based, there was a choice of two approaches. One of them, and the most attractive of the two, was a population study, i. e. an investigation of those persons with psoriasis found in a randomly selected material of the population. This proved at an early stage to be quite impracticable, for financial reasons.

The other approach was an investigation of persons who had sought medical advice for their psoriasis. There would have been considerable difficulty in tracing all these persons, as they would have seen doctors in widely spread sections of the medical service and possibly also might have been treated under another diagnosis. For this reason the material was limited to persons who had been treated in hospital for their skin disease.

Selection criteria

The following criteria were laid down for selection of the psoriatic subjects:

1. they should have been treated for psoriasis in one of the three Departments of Dermatology in the Stockholm region (in Karolinska Sjukhuset, St. Görans Sjukhus, Södersjukhuset) at some time during the years 1957—66;
2. they should have been born in 1911—15, 1921—25, 1931—35 or 1941—45, i. e. at the time of the follow-up (1970) they should be 25—29, 35—39, 45—49 or 55—59 years old;
3. they should have been domiciled in the City or County of Stockholm at the time of hospitalization in question;
4. the principal reason for admission to hospital should have been psoriasis;
5. the diagnosis of psoriasis should have been unequivocal.

Representativeness

The choice of selection criteria meant a considerable limitation of the studied material as compared with a population material. This limitation may be an example of the so called iceberg phenomenon well known in epidemiology, which means that those persons who seek medical aid for a certain disease (= the top of the iceberg) are not representative of all persons in the population who have that disease. The choice of inpatient medical care implies further selection, in that patients who have been admitted to hospital for care are not representative of all those who have seen a doctor for their disease. These selection phenomena were first pointed out by Berkson (20).

The studied psoriatics thus could not be considered representative of persons with psoriasis within that region. They were, however, considered to be representative of those psoriatics within the city region who had had their psoriasis for a long time and had at some time received inpatient hospital care for this disease.

TABLE I. Age and sex distributions of the psoriatics in the participant group and, in parentheses, the non-participant group.

Age at follow-up	Men	Women	Total
25—29	25 (7)	77 (15)	102 (22)
35—39	23 (8)	44 (4)	67 (12)
45—49	45 (11)	39 (3)	84 (14)
55—59	48 (20)	28 (11)	76 (31)
Total	141 (46)	188 (33)	329 (79)

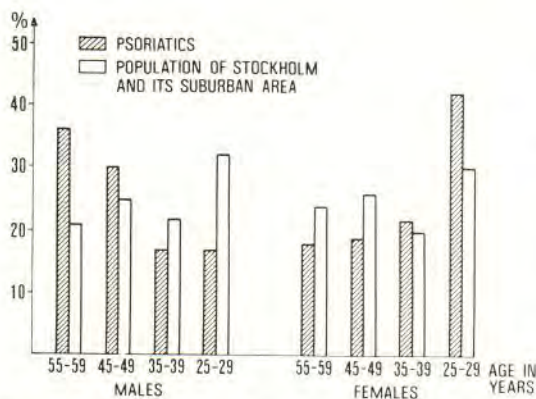


Fig. 1. Relative distribution of the investigated material of psoriatics ($n = 408$) into the four age groups studied, compared with the corresponding distribution of the population of Greater Stockholm (Dec. 31, 1969).

Participation and non-participation

The whole material of treated psoriatics who fulfilled the above criteria comprised 445 persons. At the time of the follow-up 27 persons had died and 10 had emigrated. Thus 408 persons were still alive and resident in Sweden — the *total group*.

All persons in the total group were asked, either by letter or by telephone, to take part in the follow-up investigation. 329 persons (81 %) agreed, and answered the questionnaire (the *participant group*). Of these, 29 were unable to come for the clinical part of the investigation; half of them were living in other parts of the country, and the other half gave reasons such as difficulties in getting away from work or in leaving sick relatives.

The clinical investigation therefore comprised 300 persons.

Seventy-nine persons refused to take part in the investigation, for various reasons (the *non-participant group*). This group will be treated separately in Appendix V.

The age and sex distributions in the participant and non-participant groups are given in Table I.

Fig. 1 shows the relative distribution of the material into the four age groups in relation to the corresponding distribution of the population in Greater Stockholm on 31 December 1969 (129). There were clear differences in this respect between the psoriatics (total group) and the latter population.

A larger number of psoriatic men belonged to older age groups and a larger number of psoriatic women to younger age groups than would have been the case if the psoriatics had had the same distribution as the population. It is extremely improbable that this age pattern corresponds to the age prevalence for psoriasis within the population. The most probable explanation would seem to be that age factors had played a part in admission to hospital. This must be taken into account when evaluating the results to be reported here.

Place of residence

At the time of the follow-up 92 % of the persons in the participant group were resident in urban districts — 80 % in Greater Stockholm and 12 % in other towns in the County of Stockholm.

All persons in the non-participant group were resident in urban districts — 81 % of them in Greater Stockholm.

The County of Stockholm has a population of 1,477,000, and the City of Stockholm 740,000. Greater Stockholm includes the City of Stockholm and its suburban areas, with a total population of 1,345,000. These figures refer to December 31, 1969 (129).

The distinctly separated age groups were chosen so that any variations with age should be more clearly evident.

In the Stockholm region there are three hospitals equipped with Departments of Dermatology. In hospitals that have no such departments, patients with psoriasis are cared for mainly in the Department of Medicine. No persons who otherwise satisfied the above selection criteria had, however, been treated for psoriasis in any of the Departments of Medicine in the region.

One of the three Departments of Dermatology in particular, that in Karolinska Sjukhuset, often treats psoriatic patients referred from other counties. As the indications for this so called specialist referral could not be considered comparable with the indications for admission of persons resident in the City or County, the material was limited to include only those who at the time of hospitalization were registered in the City or County of Stockholm.

Since one of the criteria was that the principal reason for hospitalization should be psoriasis, all persons were excluded who, although they had psoriasis, had been admitted to hospital for another reason. Examples of this are admission for care of varicose ulcers, and investigation of malignant diseases or occupational skin diseases. A further criterion was that the psoriasis diagnosis should be unequivocal. In some persons it could not be decided during their stay in hospital whether the diagnosis should be seborrheic dermatitis, and they were therefore excluded. For the same reason some persons with isolated pustulosis of the hand and foot were excluded, as there is some doubt as to the nosologic position of this disease as against psoriasis. Persons with hand and foot pustulosis underwent a special study (43).

B. THE CONTROL MATERIAL

It would have been desirable to use as controls a randomly selected group of persons without psoriasis for comparison with the psoriatics, but this was not feasible. Because of a clearly negative attitude of many of the selected persons to participation in the investigation, the non-participation would have been too great to be acceptable. The selected persons therefore could only be used for comparative studies of certain filed data (see below).

Other, available material therefore had to be used. As the psoriatics to be studied came from the Stockholm region, the control material also had to be taken from the same region.

Some of the control persons had been examined a few years before the present investigation of the psoriatics took place, but this was not considered to render them unsuitable as controls.

Matched controls

From the local register of the Regional Social Insurance Offices, the nearest person with the same date of birth and sex to follow each respective psoriatic in the register was chosen. This was done by the staff of the Social Insurance Office. These controls were thus "matched" to the psoriatics with respect to age, sex and place of residence.

Controls from the Inquiry into Low Incomes (ILI)

As part of the Swedish State Commission of Inquiry into Low Incomes (Inquiry into Low Incomes, ILI; *Låginkomstutredningen*), a study was made in 1968 of the general state of health and social conditions of persons randomly selected from the Swedish population, named the Investigation of Living Standards (67, 68, 135). The principles of selection have been described in detail (67). From this

TABLE II. Age and sex distributions of the control material.

Age	Men	Women	Total
<i>ILI controls</i>			
25—29	32	33	65
35—39	29	28	57
45—49	35	50	85
55—59	42	30	72
Total	138	141	279
<i>HSSE controls</i>			
25—29	—	—	—
35—39	53	52	105
45—49	72	58	130
55—59	58	56	114
Total	183	166	349
<i>HSCC controls</i>			
25—29	80	74	154
35—39	76	67	143
45—49	76	73	149
55—59	83	86	169
Total	315	300	615

material, which has been stored in computers at the Uppsala University Data Centre, those persons who had taken part in the Investigation of Living Standards and who at the time of the present investigation were of the same age as the studied psoriatics and were resident in Greater Stockholm were selected. In the following these persons will be called ILI controls (Table II).

Controls from a health survey of State employees (HSSE)

During 1965—66 a health survey of about 1,000 persons randomly selected from the approximately 80,000 State employees in the Stockholm region was carried out. This survey was part of an investigation conducted by the Ministry for Civil Service Affairs concerning health control of State employees (55, 61). The principles of selection have been described in detail (61). The construction of this investigation was such that part of the material could be used as a control for comparison with the psoriatics. From this health survey material persons who at the time of that survey were of ages corresponding to those of

the psoriatics were selected. In the following these persons will be called HSSE (health survey, state employees) controls (Table II).

Controls from a health survey in the County of Stockholm (HSCC)

During 1966—67 a health survey of about 1,000 persons randomly selected from the population of the County of Stockholm was carried out. The principles of selection have been described in detail (62). The arrangement of this survey was the same as for the health survey of state employees, and the material could be used as control material for the present investigation to the same extent. In the following these persons will be called HSCC (health survey, county controls) (Table II).

All information collected at these two health surveys was stored in computers at the Karolinska Sjukhuset Data Centre.

Controls from roentgenological investigations

From the 1971—1972 records of the Department of Diagnostic Radiology of the Karolinska Sjukhuset, urograms from 26 women from each of the age groups 25—29 and 35—39 years were randomly selected. Members of the staff of the records department did the selecting without having any knowledge of the reason for the selection. These roentgenological examinations had been performed in most cases for investigation of recurrent infections of the urinary tract, but in some cases for gynaecological disorders or suspected tumours. The roentgenograms were used for comparison with roentgenograms of the psoriatics with respect to the occurrence of changes in the sacro-iliac joints.

Comments

Skin diseases, including of course psoriasis, occurred among persons of the control material. Of the matched controls, three persons

had at some time had sick leave with a diagnosis of psoriasis. These were excluded and were replaced by new matched controls, by the same procedure. Thus the finally selected matched controls included no-one who had had sick leave for psoriasis; this did not exclude the occurrence of psoriasis amongst them.

When selecting the ILI controls, persons who had given an affirmative answer to the question of whether they had eczema, psoriasis or any other skin disease were excluded; these corresponded to 6 %. Thus the ILI controls included no-one with known psoriasis. Further, the formulation of the questions meant that persons with other skin diseases were also automatically excluded.

Among the HSSE controls there were 5 persons with distinct psoriatic lesions (1.4 %). For technical reasons concerning the data processing these persons were included among the others in the comparisons.

No reliable information was available concerning the number of psoriatics among the HSCC controls.

The roentgenological controls comprised a very selected group and could not be described as "normal material". They were, however, selected such as to constitute a risk group with respect to urogenital diseases. This will be discussed in more detail in Chapter V.

The results of comparisons between hospitalized material, such as that investigated here, and non-hospitalized controls must be interpreted with some reservation. Differences found may be due to several factors. The disease studied, in this case psoriasis, may be one factor, but not necessarily the only or the decisive one. For a hospitalized material it must be taken into account that different selection factors may play a large role. For these reasons there are, in fact, no ideal controls for hospitalized material.



III. METHODS

The following methods were used for collecting information relevant to the investigation.

- i) questionnaires
- ii) interviews
- iii) examination of the subjects; this comprised a general physical examination, dermatological and roentgenological examinations and laboratory tests.
- iv) collection of information from filed data.

A. CASE HISTORY OF PSORIATICS

Questionnaire

Most of the information concerning the psoriatics was obtained by means of a questionnaire. A printed questionnaire was mailed to all psoriatics, and they filled in the answers themselves at home before the actual examinations were performed (see Appendix II).

The decision to collect the major part of the information by this technique was based upon the following considerations:

Different types of questionnaires for collecting data in medical connections have been used to an increasing extent during the last two decades. Epidemiological studies and health surveys gave rise to a need for strict standardization of questions. By formulating clinical questions in a standardized way the individual bias that is introduced by the doctor, for example, when taking the medical history, is reduced and the answers to the

questions may be used for comparative purposes. Cochrane *et al.* (30) and Fletcher (48) were among the first to emphasize that medical questions should be treated in the same way as any other test, and their reproducibility, validity and discriminating power evaluated.

The self-administered questionnaire, i.e. the questionnaire that is answered by the patient himself, has the great advantage of allowing some standardization, uniformity of administration and minimal interviewer bias (31).

The drawbacks of this type of questionnaire are difficulties of a purely semantic nature in the formulation of the questions and an increased number of unanswered questions compared with a personal interview, as well as fewer possibilities of explaining questions precisely.

The questionnaire used here was constructed mainly of "closed" questions, i.e. answerable by "yes" or "no", but there were also some "open" questions, to be answered in the patient's own words.

The questionnaire was divided into four sections. Two sections consisted of questions concerning the *previous and present state of health*. The questions in this section had been asked at the health surveys which were used as comparisons. The questions were constructed at the Department of Medicine of the Serafimerlasarettet, under the leadership of Dr. Paul Hall (53, 54). The questions dealing with the previous state of health were mainly concerned with hospitalization, operations and ambulant care for given diseases. Those dealing with the present state of health were

mostly divided according to the respective organs, with descriptions of symptoms.

A third section of the questionnaire was constructed specially for the present investigation and contained questions on *psoriasis* — on the onset, nature, extent and course of the disease. This section also contained questions concerning joint symptoms. The latter part of the section started with a general question: "Have you had any joint complaints?" If the answer to this question was "no", the patient continued with the next part of the section. If the answer was "yes", questions were then answered as to the onset, nature and extent of the joint symptoms and their relation to the skin disease.

The fourth section of the questionnaire, which was also constructed for this investigation, comprised *socio-medical* questions. These chiefly concerned education and occupational training, occupation, social assistance and housing conditions.

The questions concerning the previous and present state of health, included in two of the sections, have been examined in detail for reliability and validity by Mellner (99). He found that when the same questions were answered again after one week the patients gave the same positive answer in 83 % and the same negative answer in 98 %, and that a change from a positive to a negative answer was 10 times more usual than vice versa. The reliability of the answers was considered to be high. Similar results have been reported by Collen *et al.* (31) on repetition of questions after half an hour.

The sections of the questionnaire that had been constructed specially for the present investigation were tested in two steps. In a preliminary version they were tested on a small number of hospitalized psoriatics, and in a second version on about a hundred psoriatics in connection with a study of the effect of climate therapy on psoriasis (101); in both cases the questions were answered a second time after one month. Those questions

that were answered differently on the two occasions by 20 % or more of the patients were removed or altered, as well as some other questions that were criticized by these patients.

Interview

In the clinical part of the investigation a personal interview was made by the author, mainly concerning the course of the psoriasis and the occurrence of joint symptoms.

In the interview questions were asked particularly about the manifestations and course of the skin disease during the years, and from the information obtained the severity of the course was graded according to a four-grade scale:

- I — mild, i.e. mild eruptions during the years
- II — moderate
- III — severe
- IV — very severe.

This was complemented with the psoriatic's own subjective experience of the complaints caused by the skin disease, similarly graded according to a four-grade scale:

- I — none or slight
- II — moderate
- III — great
- IV — very great

The patient was asked to compare himself in this respect with persons in his environment without psoriasis.

In the interview on joint symptoms the same introductory question was asked as in the questionnaire: "Have you (or have you had) any joint complaints?" Eight percent of the psoriatics changed a previously negative answer in the questionnaire to a positive one in the interview. In no case was the reverse observed. More detailed questions about the joint symptoms were asked if the introductory question was answered by "yes". In this way joint symptoms of a clearly traumatic cause were excluded; this applied to 8 % of the psoriatics.

In the interview the functional capacity was also evaluated. This was graded into four classes as suggested by Steinbrocker *et al.* (131):

- I — complete functional capacity with ability to carry on all usual duties without handicaps
- II — functional capacity adequate to conduct normal activities despite handicap or discomfort or limited mobility to one or more joints
- III — functional capacity adequate to perform only little or none of the duties of usual occupation or of self care
- IV — largely or wholly incapacitated with the patient bedridden or confined to a wheel-chair, permitting little or no self care.

This functional grading was complemented by the patient's subjective opinion of his joint complaints, similarly graded according to a four-grade scale:

- I — none or slight
- II — moderate
- III — great
- IV — very great

The patients was asked to compare himself in this respect with persons in his environment without joint symptoms.

Problems concerning these gradations will be discussed in connection with the report of the results — as regards the course of the psoriasis in Chapter IV and as regards the joint symptoms in Chapter V.

B. PHYSICAL EXAMINATION OF PSORIATICS

In the clinical part of the investigation the following special examinations were performed in addition to the conventional physical examination.

State of skin

Examination of the skin included a study of the type and extent of the psoriatic lesions and of their intensity and localization.

The *type* was described as:

- guttate < 1 cm in diameter
- nummular 1—5 cm
- large plaques > 5 cm
- generalized

The *extent* was estimated in percent of the total body surface area, using Berkow's method for determining the relative areas of different parts of the body (19) (Fig. 2). On the basis of this estimated percentual skin involvement, the extent of the psoriatic lesions was graded into four classes:

- I — minimal < 5 %
- II — moderate 5—30 %
- III — large 30—75 %
- IV — very large > 75 %

The *intensity* of the psoriatic lesions was also graded into four classes:

- I — minimal (doubtful)
- II — mild
- III — moderate
- IV — severe

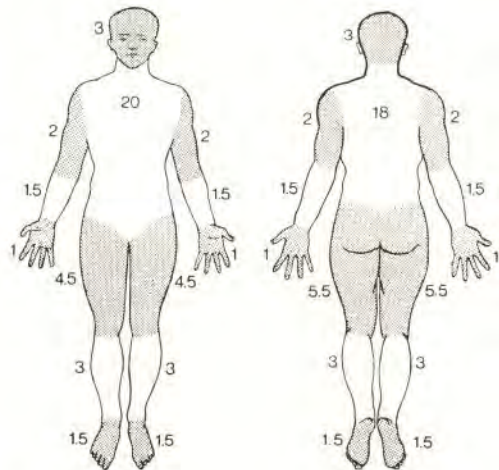


Fig. 2. Relative areas of different parts of the body in percent of the total body surface area, according to Berkow (19).

TABLE III. Joints examined clinically and roentgenologically (the latter indicated by +). The figures in parentheses represent the number of persons either in whom roentgenological examination of the joint in question was not performed or whose roentgenograms were not evaluable, in percent of the total number of persons examined roentgenologically (204 persons).

	<i>Rtg</i>
<i>"RA joints"</i>	
Shoulders	
Elbows	
Wrists	+ (5)
Metacarpophalangeal joints (MCP) 1—5	+ (5)
Proximal interphalangeal joints (PIP) 2—5, hands	+ (5)
Cervical spine	+ (70)
Knees	
Ankles	+ (7)
Metatarsophalangeal joints (MTP) 2—5	+ (7)
Proximal interphalangeal joints (PIP) 2—5, feet	+ (7)
<i>"non-RA joints"</i>	
Carpometacarpal joints (CMC) 1	+ (5)
Distal interphalangeal joints (DIP) 1—5, hands	+ (5)
Lumbar spine	+ (25)
Sacro-iliac joints	+ (0,5)
Hips	+ (11)
Metatarsophalangeal joints (MTP) 1	+ (7)
Distal interphalangeal joints DIP) 1—4, feet	+ (8)

TABLE IV. Clinical and roentgenological variables

<i>Clinical variables</i>	<i>Roentgenological variables</i>
Swelling	Reduction of joint space
Tenderness	Erosion
Pain on movement	Delimitation of erosion
Stiffness	Subluxation
Limitation of movement	Ankylosis
Subluxation	Osteopenia
Ankylosis	Osteoarthritis (OA)

When grading the intensity of the psoriatic lesions consideration was taken mainly of the palpable infiltration, the degree of intensity being decided by the greatest palpable infiltration. Grade I represented lesions that were practically healed.

The grading of the intensity was influenced to a lesser degree by exfoliation, as this is affected by current local therapy and is therefore a more uncertain factor.

In a pilot study on about 20 psoriatic patients prior to the present investigation, the extent of different types of psoriatic lesions was determined by cutting out paper corresponding to the extent of the lesions, after which the total area was determined by weighing the pieces and relating their weight to the weight of an area unit of the same type of paper. The total body surface area was determined by means of a nomogram according to DuBois (39). Guttate lesions never occupied more than 5 %, and neither did small nummular lesions or isolated large plaques. Larger or more numerous nummular lesions never occupied more than 30 %. Generalized forms of the subtotal or total erythrodermal type occupied more than 75 % of the body surface area. The lower limit for "large extent" was placed at 30 % in analogy with the current evaluation of the extent of burns.

Joint condition

The joints that were included in the routine joint examination of every participant are presented in Table III. The joints were examined according to a predetermined scheme, with evaluation of swelling, tenderness, pain on movement, stiffness, limitation of movement, subluxation and ankylosis (Table IV). Extra-articular changes such as subcutaneous nodules were recorded.

Joint changes were graded as "non-existent or doubtful", "distinct" and "severe". In the statistical analyses, however, only the terms non-existent (i. e. "non-existent or doubtful") and existent (i. e. "distinct" or "severe") were used. The changes were recorded for each side separately.

The mobility of the back was evaluated in two planes, antero-posterior and lateral.

Simultaneous with the evaluation of the back an assessment was made of the expiration-inspiration difference of the thoracic cage. Normally, on measurement at the mamill-

lary level in men and at the lower margin of the scapula in women, this difference is 5—7 cm (111, 118). Measurement was performed in cases where it was apparent that the difference was diminished. It was recorded in cm.

At a further examination of patients who had been found to have roentgenologically erosive lesions in the sacro-iliac joints, approximately one year after the first examination, the back and its mobility were examined and the expansion of the chest cage measured.

When recording changes in certain peripheral joints such as distal and proximal interphalangeal joints (DIP and PIP, respectively), metacarpophalangeal joints (MCP) and metatarsophalangeal joints (MTP), these joint groups were each regarded as a unit.

In accordance with the criteria recommended for the diagnosis of rheumatoid arthritis (RA) at the Third International Symposium on Population Studies of the Rheumatic Diseases in New York in 1966 (18), the examined joints were classified into RA joints, i. e. joints which characteristically are involved in rheumatoid arthritis, and non-RA joints, i. e. those which are not characteristically involved in rheumatoid arthritis. This classification is presented in Table III.

The difficulties that arise when evaluating the clinical symptoms that were recorded in this investigation are discussed in some detail in connection with the analysis of the occurrence of different symptoms (Chapter V).

State of prostate

In all male psoriatics an examination was made of the prostate gland and seminal vesicles.

The technical procedure in palpatory evaluation of the male accessory sex glands and in massage and expression of these glands has been described in detail by Romanus (118). On palpation, which was done with the patient standing, bending forwards and sup-

porting himself by the elbows on an examination couch, the prostate was evaluated with respect to size and the presence of a central groove, consistency, tenderness and to whether the boundaries were free. Further, an examination was made to find out whether the seminal vesicles were palpable, which normally they should not be.

The male patients who had shown roentgenological erosions of the sacro-iliac joints were examined again 6—12 months later, with further palpation of the prostate gland and seminal vesicles, and massage and expression of prostate secretion. The palpation and expression were performed after the patient had emptied his bladder.

C. ROENTGENOLOGICAL EXAMINATION OF PSORIATICS

The roentgenological examinations were performed at the Departments of Diagnostic Radiology of the Karolinska Sjukhuset and the Norrbacka Institutet. For technical reasons only three persons could be examined each day.

Routinely, roentgenographs were taken of the hands and feet and of the sacro-iliac joints, hip joints and lumbar spine. The cervical spine was examined in about one-third of the cases (Table III).

Pregnant women (four) were not examined roentgenologically.

Technique

The following techniques were used:
hand and wrist were examined according to Nørgaard (104);
foot and ankle: antero-posterior and lateral projections of the ankle, and frontal and slightly rotated lateral projections of the foot, the latter including the calcaneus;

TABLE V. Scoring of the severity of arthritic changes (erosions) in the hands and feet in psoriatic arthritis. Modified according to Allander (2). The modification meant that erosions in DIP were also accepted.

Roentgenological changes	Scores			
	1	2	3	4
Minimal erosions (grade 2)	Single erosions in RC, IC, CMC, MCP, PIP, DIP, MTP	Two erosions in RC, IC, CMC, MCP, PIP, DIP, MTP	—	—
Moderate erosions (grade 3)	—	Single erosions in RC, IC, CMC, MCP, PIP, DIP, MTP	Four erosions in RC, IC, CMC, MCP, PIP, DIP, MTP	
Severe erosions (grade 4)	—	Single erosions in RC, IC, CMC, MCP, PIP, DIP, MTP	Three erosions in RC, IC, CMC, MCP, PIP, DIP, MTP	
Reduction of joint space	Present in at least one joint			
Ankylosis	—	—	—	Present in at least one joint
Comments		Single erosions in DIP V not accepted	Single severe erosions in RC, IC, CMC, MCP, PIP, DIP, MTP accepted in association with two minimal or moderate erosions in other joints	

RC = radiocarpal joints, IC = intercarpal joints, CMC = carpometacarpal joints, MCP = metacarpophalangeal joints, PIP = proximal interphalangeal joints, DIP = distal interphalangeal joints, MTP = metatarsophalangeal joints.

cervical spine: antero-posterior and lateral projections. Film with intensifying screens;
 lumbar spine: antero-posterior and lateral projections. Film with intensifying screens;
 hip joint: antero-posterior projection. Film with intensifying screens;

sacro-iliac joint: postero-anterior projection without tilting of the tube, and in some cases also antero-posterior projection with the tube tilted at an angle of about 25° with the feet. Film with intensifying screens.

Grading of variables

For each joint or group of joints the following seven changes were recorded: reduction of the joint space, erosion, delimitation of erosion, subluxation, ankylosis, osteopenia and osteoarthritis (OA).

Erosive and osteoarthrotic changes were defined and graded in accordance with the criteria recommended by Engel *et al.* (44) and Kellgren *et al.* (71). The grades were:

- 0 — no changes
- 1 — doubtful
- 2 — minimal
- 3 — moderate
- 4 — severe.

In the analyses grades 0 and 1 were combined and regarded as "no changes".

A scheme for scoring the severity of arthritic changes (erosions) in the hands and feet, suggested by Allander (2) for grading of rheumatoid arthritis, was used (Table V). A modification was made with respect to the distal interphalangeal joints. For a discussion on these joints, the reader is referred to Chapter V.

Evaluation procedure

The roentgenograms were read by a roentgenologist (Ass. Professor Nils Lindvall, Karolinska Sjukhuset) on three different occasions — on the first occasion alone and on the other two together with the author. A magnification apparatus (so called Mattsson binoculars) was used in the evaluation of the films. At the first reading of the films any changes were recorded as a conventional radiographic report. On the second occasion all negative and positive findings were recorded separately for each joint or group of joints, using the grading procedure described above. When evaluating the films neither the roentgenologist nor the author had access to information on the findings at the clinical examination. Intra-observational differences between the first and the second occasions of film-reading

could not be expressed numerically because of differences in the form of recording, but they were very small.

In order to test the reproducibility, a third reading was carried out four months after the second, comprising 100 sacro-iliac joints. In only 6 % was there a change in the grading — in half of these from a higher to a lower grade of erosion.

It has been clearly shown that there may be considerable differences between different observers in the evaluation of roentgenograms, even in strictly "blind" observations, i.e. when the observers in question have no knowledge of the clinical situation, but intra-observer differences have also been described (21, 35, 71).

In order to obtain a further evaluation of the roentgenograms, 56 films of sacro-iliac joints (29 of men and 27 of women) were chosen randomly and sent to Professor John S. Lawrence, Manchester, England, who kindly agreed to evaluate them in accordance with the criteria mentioned above.

D. LABORATORY INVESTIGATIONS

Serology

Serological examination — SCAT (Sheep Cell Agglutination Test, Rose-Waaler test) — was performed for the presence of rheumatoid factors (RF). This test was the one usually used at the hospital, and it was performed with the kind collaboration of Professor Nanna Svartz at the King Gustav V Research Laboratory, Stockholm. The method of determination has been described by Svartz (134).

Cytology

A drop of prostatic secretion (the last portion) was smeared on a slide, dried in the air

and stained according to Papanicolaou. The preparations were then evaluated both by the author and by Professor Elisabeth Johannison, Karolinska Sjukhuset, independently, with respect to the relative occurrence of different cell elements. The cytological findings were graded as follows (66):

- I — normal picture: occasional leukocytes, occasional normal prostate cells;
- II — doubtful — slight inflammation: 1—10 leukocytes per visual field (magnification 400 x);
- III — moderate inflammation: more than 10 leukocytes per visual field or small aggregations;
- IV — severe inflammation: abundant leukocytes well distributed in the secretion, large aggregations of leukocytes, prostate cells with inflammatory changes.

At the same time as the prostatic secretion examination, the urine was examined for the presence of protein and the urine sediment for the presence of cells.

E. REGISTER DATA

Regional Social Insurance Office

Every Swedish citizen is registered in the local files of the Regional Social Insurance Office, where since 1955 there has been a so called membership card for each person. On this card are recorded periods of illness, number of days of illness (i. e. days of receiving sickness benefit), the reason for application for sickness benefit (diagnosis), disability pensions, and sickness benefits received. The person's date of birth, civil state, occupation and address are also given.

The number of sickness benefit days comprises the number of days of each period of illness minus the so called "days off", in principle up to 1967 the first three days, and

since that year the first day, of each period of illness, for which days no sickness benefit is paid. An exception is made if a period of illness occurs within 20 days after a previous one, when there are no "days off" and the number of sickness benefit days in the later period are equal to the total days of illness.

If a period of illness does not exceed 7 days, it is sufficient that the sick person himself reports the reason for application for sick benefit. If it exceeds 7 days, a doctor's certificate is required. The Social Insurance Office may also demand a doctor's certificate for shorter periods if a person has had an unusually large number of short periods of illness.

The membership cards for the investigated psoriatics were gone through and the number of days of illness were noted for the three five-year periods 1955—59, 1960—64 and 1965—69, a record being made of whether the diagnosis was psoriasis or another disease (psoriasis diagnosis and non-psoriasis diagnosis). Short periods of illness (7 days or fewer) were counted as non-psoriasis periods of illness. The mean numbers of days of illness were then calculated for the respective five-year periods, and a record was made of the number of days for which the psoriatics in question were entitled to sickness benefit.

For persons receiving disability pension, no periods of illness are recorded on the membership card except for periods of hospitalization, as such pensioners are not entitled to sickness benefit over and above the disability pension. No patient who was receiving a disability pension was therefore included in the above calculation on days of illness.

For further discussion on problems concerning sick leave and the diagnoses for periods of illness, the reader is referred to Chapter VII.

The sickness benefit to which the person concerned is entitled in the event of illness is stated on the membership card. This sickness benefit is directly related to the income

from employment and is changed in accordance with any changes in this income; the sickness benefit is not affected by income from capital, however. The sickness benefit to which the psoriatics were entitled was noted for 1 January 1965 and for 1 January 1970, i.e. for the beginning and end of the last five-year period. The change in sickness benefit was also calculated, consideration being taken of the alteration in the sickness benefit scale that had been made between these two time points.

F. INFORMATION CONCERNING THE CONTROL GROUPS

Matched controls

The matched controls were selected from the local files of the Regional Social Insurance Office, and the membership cards of the selected controls were picked out. These controls were used for comparisons of the data recorded on the membership cards.

ILI controls

Those persons who were included in the Inquiry into Low Incomes had been interviewed personally by specially trained interviewers, according to standardized checklists (67, 68). The information thus collected differed methodologically from that collected for the psoriatics. The interviews took place during 1968.

These controls were used mainly for comparisons concerning social conditions such as civil state, number of children, housing situation, education, occupation, social group, and to some extent state of health.

HSSE and HSCC controls

At the two health surveys that were utilized for certain comparisons, information was collected concerning the previous and present state of health of the examinees by means of

printed self-administered questionnaires containing the same questions that were used for the psoriatics. The questionnaires were filled in at home by the examinees themselves prior to the clinical part of the respective health examinations. Thus both the mode of procedure and the questions were standardized as far as possible. Furthermore, in the health survey of the state employees the clinical part of the examination was performed by the author in all cases (54, 55).

Roentgenological controls

In the urographic examination the same technique was used for plain films as in examination of the sacro-iliac joints, possibly with a slightly different angle of the roentgen tube; this difference never exceeded 5°, however.

G. STATISTICAL METHODS

Conventional statistical methods were used (128).

Differences between different parts of the material were tested with the chi² method; Yate's correction for discontinuity was used here.

Differences between mean values and between mean values of differences between matched pairs were tested with Student's t-test.

The null hypothesis, that no difference or no correlation existed, was rejected at the significance levels 5 % ($p < 0.05$ — almost significant), 1 % ($p < 0.01$ — significant) and 0.1 % ($p < 0.001$ — highly significant).

The correlation between different quantitative variables was tested by correlation analysis either by means of an IBM computer 360, using a programme described by Zachrisson & Reizenstein (157) or by calculation

on a Canola 164P electronic desk calculator by the formula:

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{(n \sum x^2 - (\sum x)^2)(n \sum y^2 - (\sum y)^2)}}$$

Partial correlation between two variables independent of the third variable was calculated by the formula:

$$r_{ab:c} = \frac{r_{ab} - (r_{ac} \cdot r_{bc})}{\sqrt{(1 - r_{ac}^2) \cdot (1 - r_{bc}^2)}}$$

where $r_{ab:c}$ is the coefficient for the partial correlation being calculated, r_{ab} is the coefficient for the correlation between a and b, and r_{ac} and r_{bc} are the corresponding coefficients for a and c, and b and c, respectively.

Stepwise regression analysis was performed by means of a programme BMD 02 R (36) at the Data Centre of the Karolinska Institutet.

TABLE VI. Onset of psoriasis before the age of 20 years as reported by different authors. Percentage figures are given.

Author	Onset of psoriasis before the age of 20 years	
	men	women
Hoede (60)	41	62
Steinke (132)	35	58
Romanus (119)	54	77
Steinberg et al. (130)	24	40
Ingram (63)	34	41
Lomholt (90)	70	75
Present investigation	42	65

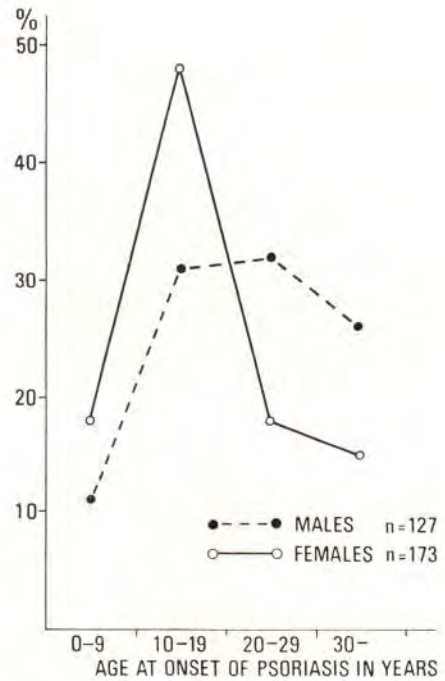


Fig. 3. Age at onset of psoriasis among men and women.

IV. COURSE AND DEGREE OF SEVERITY OF THE PSORIASIS

A. AGE AT ONSET, DURATION AND FAMILIAL OCCURRENCE

Age at onset, duration

Previous investigations. In several previous investigations on the age at onset of psoriasis, a more or less marked predominance of women has been found among persons who developed the disease at a young age. Table VI summarizes data from some investigations in which the sex distribution of the age at onset has been given. In all of these series the relative number of women in whom the disease began before the age of 20 years was greater than that of men. The same has been reported by Farber *et al.* (46) and Janula & Novolty (65).

Present investigation.

Results and comments. The age at onset of psoriasis in men and women of the studied material is presented in Fig. 3. There is a distinct predominance of women among those who were younger than 20 years at the onset of the disease.

Fig. 4 presents the age at onset related to the age of the psoriatics at the time of the follow-up, for men and women. The figure shows a clear predominance of persons with an onset at an early age among those in the younger age groups.

The duration of the disease up to the time of the follow-up can also be seen in Fig. 4. Only 4 % of the men and 9 % of the women had had the disease for less than 10 years.

Regarding the material as a whole, an earlier onset of psoriasis was found in women than in men, i.e. the same as has been reported previously by several authors. When the mean ages (for men 23 ± 11 years, for women 18 ± 10 years) and the median ages (for men 21 years, for women 15 years), respectively, at onset were compared, the difference was considerable; the difference between the mean ages at onset was highly significant. Fig. 3 has been drawn to facilitate comparisons with the results reported and cited by Lomholt (90).

In this material there was a strong relation between younger ages at the time of the follow-up and an early onset (highly significant). In the youngest age group (25-29 years) the disease had started before the age of 20 years in 95 % of the men and 94 % of the women, and the corresponding figures for the next youngest age group (35-39 years) were 59 % and 61 %, respectively. In the oldest age group (55-59 years) there was a difference; here the figures were 18 % and 44 %.

The difference in age at onset, which is shown in Fig. 3, was thus markedly associated with the age composition of the material. This illustrates the importance of taking into account the composition of a material when evaluating such factors as age at onset.

It is possible that the composition of the material had the same effect in the above-cited studies in which sex differences were found with respect to age at onset, especially those studies which were made on hospitalized patients.

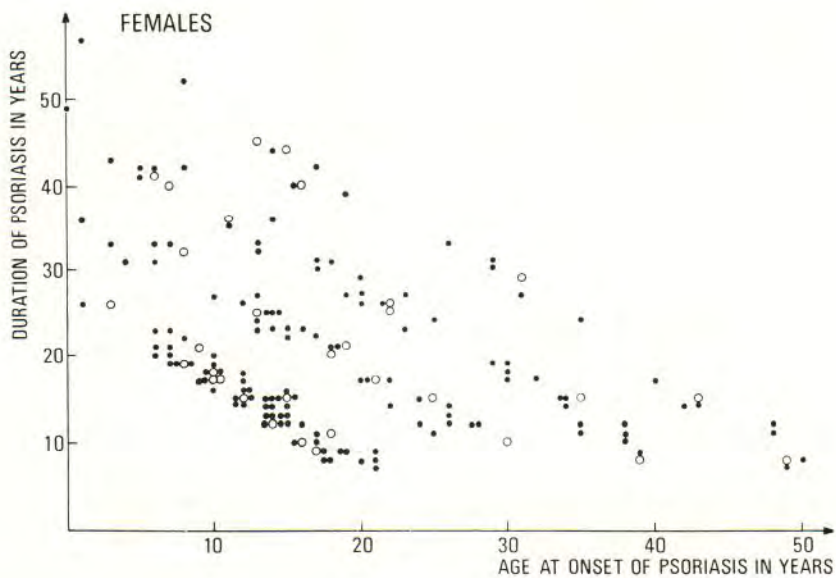
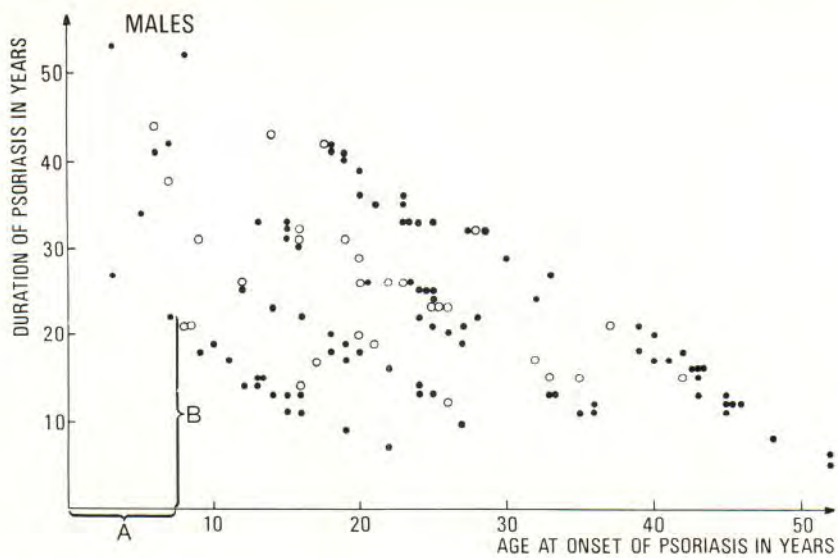


Fig. 4. Age at onset of psoriasis in relation to duration of psoriasis and to the age of the psoriatics at the follow-up. The sum of A (= age at onset of psoriasis) and B (= duration of psoriasis) comprises the age at the follow-up. O indicate psoriatics with arthritis.

Familial occurrence

Previous investigation. Information on the familial occurrence of psoriasis has been published by several authors and has been summarized by Romanus (119) and Lomholt (90). The frequency figures usually vary between 30 and 40 %, but figures almost as low as 10 % and over 50 % have been reported.

In his investigation, Lomholt (90) found no evidence that among psoriatics whose parents also had psoriasis the disease had had an earlier onset than in those whose parents had not had psoriasis. Neither was the nature of the disease related to the fact of whether the parents also had psoriasis.

Present investigation.

Results and comments. Psoriasis occurred in the family (parents, siblings) in 40 % of the men and 49 % of the women, according to their own information. There was no significant difference between the age groups in this respect.

The psoriatics who reported familial occurrence of the disease were younger at the onset of their psoriasis than those who did not, in contrast to the findings of Lomholt. Familial occurrence was more pronounced among the men than among the women.

Otherwise, there was no difference in the degree of severity or nature of the disease between psoriatics with a familial occurrence and those without.

Information on familial occurrence of psoriasis is of limited value. This is due mainly to the varying definitions of "familial" used by different authors. Further, the finding of familial occurrence of the disease gives little information on the importance of hereditary factors. A study of hereditary factors was not included in the aims of the present investigation. These have been analysed comprehensively by Romanus (119) and Lomholt (90),

among others, and recently by Watson *et al.* (144).

B. SEVERITY OF THE COURSE OF THE PSORIASIS

Grading of the course

Previous investigations. There is no generally accepted system for grading the course of psoriasis, and different methods have been used to express this course. In his extensive investigation Romanus (119) divided his material into

cases consistently free from symptoms (13 %)
cases occasionally free from symptoms (16 %)
cases with continuous symptoms (71 %)
and described the nature of the disease in those with continuous symptoms as

greatly improved	
improved	
unchanged:	slight
	moderate
	severe

deteriorated
greatly deteriorated

Dorn (38) used the following description:

constant severe eruption	(14 %)
constant moderate eruption	(25 %)
constant mild eruption	(6 %)
severe eruption at intervals	(14 %)
moderate eruption at intervals	(30 %)
mild eruption at intervals	(4 %)
hitherto eruption only once	(7 %)

In his census study on the Faroe Islands, Lomholt (90) divided his material into "usual eruptions" and "periodical eruptions". He then grouped persons with "usual eruptions" into those with

no symptoms	(4 %)
mild symptoms	(32 %)
minor spread	(37 %)
major spread	(15 %)

major eruptions at an early age followed by minor eruptions at a more advanced age (11%) and persons with "periodical eruptions" into those with no symptoms major eruptions

Baugham & Sobel (15) have recently described a completely different way of expressing the degree of severity of psoriasis, based upon scoring of about fifty different symptoms, performed by a group of dermatologists and a group of hospitalized psoriatic patients. There were large variations in opinion between these two groups. This method may be valuable especially in long-term studies.

Present investigation

The variable. For grading of the severity of the disease in the present investigation a four-grade scale was used, based mainly on the method of Dorn and of Lomholt:

- I — mild
- II — moderate
- III — severe
- IV — very severe

The grades were not divided into subgroups with respect to whether the symptoms were mainly continuous or periodic, and in this way the grading differed from that of Dorn. It differed from the grading used by Lomholt in that the fifth group of that author was not included here as a separate group. These changes were made mainly to facilitate the statistical analysis. It may mean, however, that in some cases the grading may have been somewhat doubtful.

The grading of the course of the disease was done on the basis of an interview with the psoriatic by the author, at the follow-up. In order to eliminate as far as possible the participants' own opinions on the severity of the disease and the problems it had created, the actual extent and intensity of the disease at

the time of the follow-up were used as an example of mild, moderate or severe symptoms, and using this as a basis for comparison the patients were asked to describe the disease during the years. This variable thus expressed the opinion of the author on the severity of the course of the disease as based on the patient's own information.

Forming a separate group, the "healed" group, were persons who had had no visible psoriatic lesions for at least 5 years. In the subsequent analysis of the material these were included among persons with "mild symptoms".

The course of the psoriasis was studied in relation to certain features of the disease, as reported by the psoriatics themselves in their answers in the questionnaire.

These were:

- age at onset of psoriasis;
- duration of the disease;
- continuous or periodic symptoms (periodic defined as complete or almost complete freedom from lesions over a certain period, not only a short time after a course of treatment);
- seasonal variations (defined as improvement or deterioration independent of whether the symptoms were continuous or periodic; this included such seasonal improvement without complete recovery in persons with continuous symptoms);
- general tendency (a milder, unchanged or more severe course during the years);
- dominating type of lesions in the maximal psoriatic eruption hitherto, i. e. that involving the greatest skin area (divided into guttate lesions, nummular lesions, large plaques or generalized form).

Results. The degree of severity of the disease is given in Table VII for the age and sex groups. The female psoriatics had had a milder course throughout than the men (highly significant). Thus 35% of the men and 71% of the women were considered to have had a mild course; in addition 2% of the men

TABLE VII. Variables expressing the degree of severity of the psoriasis. The figures are given in percent.

Variable	Age and sex groups									
	25 — 29		35 — 39		45 — 49		55 — 59		Total	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
n =	20	66	22	41	41	39	44	27	127	173
<i>During the years</i>										
<i>Course</i>										
“healed”	10	12	5	2	0	8	0	7	2	8
mild	60	64	27	88	29	72	32	67	35	71
moderate	20	24	27	10	49	13	61	22	45	18
severe	5	1	32	0	17	5	7	0	14	2
very severe	5	0	9	0	5	2	0	4	4	1
<i>Subjective complaints</i>										
none, slight	32	41	26	32	29	36	23	29	30	36
moderate	24	27	17	23	22	26	21	25	24	26
great	8	26	43	32	22	28	29	36	29	30
very great	10	6	9	7	18	10	17	7	17	8
<i>At the follow-up</i>										
no eruption	10	12	5	2	0	8	0	7	2	8
<i>Extent</i>										
— 5 %	55	55	22	83	37	69	32	50	35	65
5—30	25	29	41	15	46	15	52	38	44	24
30—75	5	4	27	0	15	5	16	4	16	3
75—	5	0	5	0	2	3	0	0	2	1
<i>Intensity</i>										
minimal, doubtful	25	23	9	17	12	10	7	8	20	16
mild	25	52	45	54	41	56	30	65	27	55
moderate	35	12	41	22	39	21	55	19	44	17
severe	5	1	0	5	7	5	9	0	6	3
<i>Type of lesion</i>										
guttate	5	3	0	0	2	2	2	0	2	2
nummular	65	68	58	76	53	72	43	75	53	72
large plaques	15	17	32	22	41	15	55	15	40	17
generalized	5	0	5	0	2	2	0	4	2	1

and 8 % of the women had had no signs of the disease for at least 5 years. Eighteen percent of the men but only 3 % of the women had had a severe or very severe course.

Further, a significantly more severe course of the disease was found with increasing age among the men, while no such finding was made among the women.

Continuous symptoms were reported by 83 % of the men and 73 % of the women. They occurred significantly more frequently in older than in younger psoriatics. A highly significant relationship was found between continuous eruptions and a more severe course.

Seasonal variations, especially improvement during the summer, were reported by 81 % of the men and 86 % of the women. No significant difference was found in this respect between different age groups. Seasonal variations were not significantly related to the course of the disease.

Twenty-four percent of the men and 43 % of the women reported that the disease had become gradually milder during the years, and 32 % of the men and 18 % of the women reported that it had become gradually more severe. In 40 % and 32 %, respectively, it had remained unchanged. There was some relationship (almost significant) between tendency to greater severity in the nature of the disease and increasing age. A higher frequency of persons who reported a tendency to increasing severity of the disease during the years had been considered to have a severe psoriatic course than others (highly significant).

The age at onset was not related with certainty to the severity of the course when the age of the participants was taken into account. In the men a longer duration of the disease was almost significantly related to a more severe course, but this was not found in the women.

Eleven percent of the men and 15 % of the women reported that they had had guttate lesions in the maximal eruption, and 10 % of the men and 16 % of the women reported nummular lesions.

Large plaques had dominated the picture in 55 % of the men and in an equal percentage of the women, while in 23 % of the men and 11 % of the women the skin had been more or less generally involved. Guttate and nummular changes at the maximal eruption were reported significantly more frequently by younger than by older psoriatics, and significantly more frequently by women than by men. Generalized forms had been significantly more common in men than in women. There was a highly significant relationship between

more extensive lesions at this maximal eruption and a more severe course of the psoriasis. All persons who had been completely free from psoriatic lesions for several (at least) 5 years had had guttate lesions at the maximal eruption.

Comments. Owing to the variations and sometimes changeable course of the psoriasis during the years, it is difficult to grade the course in a simple scale with any degree of precision. The four-graded course variable used in this study represents an attempt to express the severity of the course in a term that is applicable in statistical analysis. The grading was facilitated by the fact that the material considered mainly of persons in whom the disease was static, and the previous duration of the state of the disease seen at the follow-up was usually more than 6 months.

As the grading was based on information obtained at an interview, there were several factors that might have influenced the results:

- the interview situation and a risk that the questions were understood differently;
- the frame of reference, i.e. the psoriatic situation at the time point and how it was experienced by the participant;
- the participant's way of describing earlier psoriatic episodes;
- the participant's memory of the previous disease situation;
- the participant's subjective experiences of his symptoms, partly associated with the localization of the lesions, whereby disease episodes may have been evaluated differently;

variations in the participant's evaluation of information given at the interview.

Some idea of the validity of the grading could be obtained through information from hospital case records from previous occasions of hospitalization. In view of the deficiencies that occur in many case records, no detailed analysis of the relationship between the course variable and information from the

TABLE VIII. Comparison between the severity of the course of the psoriasis and the subjective experience of complaints from psoriasis. The figures are given in percent.

Course of the psoriasis	Subjective complaints from psoriasis								
	n =	Men				Women			
		None slight	Moderate	Great	Very great	None, slight	Moderate	Great	Very great
	38	30	36	22	63	45	52	13	
Mild	47	57	28	0	90	76	75	69	
Moderate	45	40	47	50	8	22	19	31	
Severe	8	3	22	32	0	2	4	0	
Very severe	0	0	3	18	2	0	2	0	
Total	100	100	100	100	100	100	100	100	

case records was attempted. In general, however, there was good agreement between the case record information and the interview information upon which the course variable was based.

The course variable would seem, however, to reflect the conditions during recent years more than the whole period since the onset of the psoriasis in cases where the disease started a long time ago.

In view of the relationships to the expressions of the nature of the disease in the questionnaire, and the agreement with information in the case records from previous periods of hospitalization, the course variable was considered to be a suitable instrument for describing the degree of severity of the psoriasis, and thus suitable for use in the further analysis.

Subjective complaints from the psoriasis

Present investigation.

The variable. This subjective variable was given the form of a four-graded scale. At the interview the participant was asked to descri-

be his complaints and discomfort from the disease as

- I — none or slight
- II — moderate
- III — great
- IV — very great

The aim was thus to differentiate between the more medically descriptive course variable and the subjective experience of the complaints.

Results. Thirty percent of the men and 36 % of the women stated that they had had no or only slight complaints from their psoriasis, while 24 % of the men and 26 % of the women had had moderate complaints. Forty-six percent of the men and 38 % of the women had experienced severe or very severe complaints from the disease. The distribution of the complaints between the age and sex groups is presented in Table VII. There was some increase in subjective complaints with increasing age, but this was not significant.

The severity of the subjective complaints was similarly distributed among men and women.

In Table VIII the subjective complaints are related to the severity of the course of the

disease. It can be seen that some persons had severe complaints from their psoriasis even when the course was evaluated as mild. This was more common in women than in men. The opposite, that only mild subjective complaints were experienced despite a more advance course, was found mainly in men. With regard to differences between the subjective complaints and the course as seen from a medical aspect, there were no age differences of statistical significance.

Comments. This variable, subjective complaints, is very difficult to define. Different people have completely different norms of evaluation. The general social situation is of great importance here. The nature of the problems which were regarded as arising from the psoriasis varied greatly. The predominant problems involved contact with other people in and outside the family, not least from the sexual aspect; problems were experienced at work, at the barber or hairdresser, in public bathing places and in restaurants, etc. Others considered the scaling, the itching, the constant feeling of not being clean, or the visible eruptions to be the most problematic.

This variable was not related to any time period but was probably coloured by the situation of the last few years.

The arrangement of this investigation did not permit a detailed penetration of these subjective complaints caused by psoriasis. This would have required more comprehensive interviews. The results obtained clearly indicate, however, that the subjective complaints are considerable and are apparently of greater importance than the degree of severity of the disease for many persons, especially women, who seek and obtain hospital care for their psoriasis. This is in agreement with the more general views on the importance of subjective experiences of a disease for the utilization of health services, which have been discussed by Mechanic & Newton (98), among others.

C. PSORIATIC LESIONS AT THE FOLLOW-UP

Grading of extent, intensity and type

Previous investigations. In metabolic and biochemical studies of different conditions in psoriasis, some authors have used the percentage extent of the psoriatic lesions on the skin surface as a measure of the severity of the disease on the occasion in question. Shuster & Marks (125) and Molin & Reizenstein (102) have found relationships between extent and anaemia, and Eisen & Seegmiller (41), among others, between extent and uric acid concentration in the serum.

Tickner & Mier (137) expressed the skin involvement as slight, moderate or widespread in their studies of the relationship between psoriasis and serum cholesterol and protein, but reported in addition whether the eruptions were improving, static or worsening.

Aschheim (8) recently described a model for a more quantitative description of the psoriatic involvement, based on determination of the area and circumference of the lesions. This method is hardly suitable for clinical use, however.

In a study of climatic therapy in psoriasis, the author used the variables for extent and intensity that were intended to be used in the present investigation (101). It was found, among other things, that the intensity of the lesions was of greater importance for the therapeutic result than the extent.

The psoriatic lesions vary in form and size from one person to another and also in one and the same person from one time to another. The distribution and appearance of the lesions have previously led to detailed subclassifications of the disease. Such classifications can be of some value for giving a detailed description of clinical manifestations and for demonstrating the different degrees of expression of the disease. The pattern of development in the different types of lesions

may indicate different properties of the disease that are still unknown.

Eruptive psoriasis is often characterized by several small lesions of the guttate type with mild infiltration. More chronic, static psoriasis, on the other hand, is often characterized by fewer, larger lesions and by greater infiltration (23).

The Köbner phenomenon is induced more easily after provocation in persons with eruptive exanthematic psoriasis than in persons with psoriasis of the chronic, static form (23, 112).

Differences in the epidermal regeneration have also been found between persons with eruptive and those with chronic static psoriasis (24).

The previous duration of psoriatic lesions seen on a particular examination occasion is of importance mainly in metabolic and biochemical studies and when evaluating therapeutic results.

Present investigation.

The variables. The grading of the extent of the psoriatic lesions in percent of the body surface area, and also in a four-grade scale, is described in detail on p. 17.

The grading of the intensity of the lesions in a four-grade scale is also described on p. 17. Here consideration was taken primarily of the palpable infiltration. The reason for this was the difficulties of evaluating exfoliation, which might have been influenced by current local therapy.

At the examination a record was made, further, of the dominating type of lesion, i.e. guttate, nummular, large plaques or generalized. If two types were present at the same time the type corresponding to the greatest skin area was recorded.

Inverse forms and diffuse involvement of the scalp are examples of lesions which, if they occur in isolation, fall outside the frame of this classification into types. These did not

occur in the present material, however. Neither were there any cases with pustular lesions on the body.

Results and comments. In Table VII the extent, intensity and types of lesions in the different age and sex groups are presented.

The extent was less than 5 % (minimal) in 35 % of the men and 65 % of the women. More than 30 % of the skin was involved (widespread, very widespread) in 18 % of the men and 4 % of the women. The sex difference in the extent of the psoriasis was highly significant.

In the men an increasing extent with increasing age was also found. This relationship was significant. No corresponding increase of the extent with age was found in the women.

In statistical analyses of the extent of the psoriasis, both the percentage proportion of the body surface area involved and the four-grade scale were used. No differences were found, and the four-grade scale was therefore considered to satisfy the requirement for an extent variable for clinical and epidemiological use. For studies of relationships between extent and, for example, the results of biochemical analyses, the percentage involvement would seem to be preferable, however.

It should be pointed out that the total area covered by the lesions may easily be overestimated, especially in cases with numerous small lesions.

The intensity was evaluated as minimal or mild in 47 % of the men and 71 % of the women. Severe infiltration was present in only 6 % of the men and 3 % of the women. The sex difference with respect to intensity of the lesion was highly significant.

Increasing intensity with increasing age was observed in the men, and this relationship was significant. No difference between the female age groups was found in this respect.

With regard to the type of lesions, nummular lesions predominated; these were found

TABLE IX. Distribution of psoriatic lesions within different skin areas in persons with nummular lesions and large plaques, respectively, as the dominating type of eruption. The figures are given in percent, for men and women combined.

	Dominating type of lesion		Significance of the differences
	Nummular lesions n = 190	Large plaques n = 81	
<i>Scalp</i>			
patchy lesions	42	30	} p < 0.01
diffuse lesions	32	51	
<i>Face</i>			
isolated lesions	11	16	} —
several small lesions, confluent lesions	6	12	
<i>Back of hand</i>			
isolated lesions	15	14	} —
several small lesions, confluent lesions	8	14	
<i>Palm of hand</i>			
erythema, slight hyperkeratosis	9	21	} p < 0.01
severe hyperkeratosis, pustulae	0	5	
<i>Sole of foot</i>			
erythema, slight hyperkeratosis	8	18	} p < 0.01
severe hyperkeratosis, pustulae	2	9	
<i>External auditory meatus</i>	47	52	
<i>Gluteal region</i>			
buttocks only	27	31	} p < 0.05
crena ani only	4	1	
buttocks and crena ani simultaneously	27	42	
<i>Inverse psoriasis, other areas</i>	40	52	—
<i>Genital region</i> (glans, preputium, labium major)	25	43	p < 0.01
<i>Finger-nails</i>			
one or two affected	27	21	} p < 0.01
three or more affected	21	41	
punctate changes	29	26	
colour changes	13	25	} p < 0.05
hyperkeratosis, onycholysis, nail deformity	6	11	

in 53 % of the men and 72 % of the women. Large plaques were found in 40 % of the men and 17 % of the women. The sex difference with respect to type of lesions was highly significant.

Among the men, nummular lesions were more common in younger persons and large plaques in older. Among the women there was no significant difference between the age groups.

The intensity of the large plaques was significantly greater than that of the nummular lesions.

Large plaques were found in a not significantly higher frequency in persons with a severe course of the disease than in those with a milder course.

In women, but not in men, there was a higher frequency of large plaques among those who stated that their psoriasis had become worse during the years than among those who considered that it had remained unchanged or improved.

Seasonal variations were reported in the same frequency by psoriatics with large plaques as in those with nummular lesions.

Further, in the men, large plaques were more frequent than nummular lesions in those who had peripheral arthritic involvement.

It was also found that certain parts of the skin were more often the site of psoriatic changes when nummular lesions dominated the clinical picture, while other parts were more often involved when large plaques were predominant (Table IX). Thus, the fingernails were more frequently involved, both as regards the number of nails with changes and the degree of change, in psoriatics with large plaques than in those with nummular lesions as the predominant type. Lesions in the genital region (on the glans, preputium, labium major) occurred more frequently when large plaques were the predominant lesion than when nummular lesions dominated. There was no difference, on the other hand, as re-

gards involvement of the face and dorsal aspect of the hand.

There was a clear relationship between the type of lesions at the maximal psoriatic eruption and the type of lesions at the time of the follow-up, which reflected stability in the form of manifestation of the disease.

The duration of the extent and intensity of psoriatic lesions present at the follow-up varied between 1 month and over 5 years. The mean duration was 7 ± 3 months (mean \pm SD), while the median value was over 12 months. There was no sex difference nor any difference between the different age groups in this respect.

D. DISCUSSION

In most fields of medicine increasing attempts are being made to arrive at uniform criteria both for the diagnosis of diseases and for classification of their different stages or extent. Not until this has been achieved will it be possible to make meaningful comparisons between the results of studies on different materials.

As regards psoriasis, there has been no generally accepted way of expressing the degree of severity of the disease, due largely to the difficulties caused by its variability. The modes of expression formulated, for example, by Romanus (119), Dorn (38) and Lomholt (90), who have been cited above, have never gained wide acceptance.

However, gradation of the severity of the disease in some form is necessary. Such gradation can be done in a more or less sophisticated manner. In this study, however, the aim was to use a form of grading which required no technical aids and which could therefore be easily employed in clinical or epidemiological routine.

To provide a basis for the studies that especially concerned the socio-medical aspects, a subjective variable was used to express the nature of the disease in addition to the more medically descriptive course variable. This represented the psoriatic's own evaluation of the problems which he experienced as a result of his or her affliction. That these two variables did not correspond but showed great differences is not surprising in view of the dissimilarities in the evaluation norms for the two variables.

The results concerning the severity of the psoriasis showed that there were large discrepancies between the men and women of the material, the men showing the greater severity. This held both for the severity of the course of the psoriasis during the years and for the degree of involvement at the time of the follow-up. The differences were highly statistically significant, and still remained when age had been taken into account. To the author's knowledge such differences in this direction have not been reported previously. On the contrary, Lomholt (90) found that the women in his material from the Faroe Islands had, on the average, more severe psoriasis than the men.

The reason for the sex differences found are therefore to be sought mainly, with the greatest probability, in differences between men and women as regards the composition of the material. If it is assumed that there are in reality no sex differences in the general nature of psoriasis, such as its onset, course and severity, the results obtained here give grounds for the hypothesis that there are differences between men and women in the utilization of health service resources; these differences are due more to other causes than purely medical factors, and result in the

situation that women receive hospital care for milder forms of psoriasis than men. This will be discussed more fully in Chapter VIII.

Which variable should be used?

It became clear at an early stage of the present investigation that the whole disease panorama in psoriasis could not be represented by one single variable. Some different variables, which would overlap as little as possible, were therefore used in this study, the early stages of the disease being separated from the situation at the time of the follow-up.

The choice of variable for a planned investigation must depend upon the factors to be investigated. A study of the effect of climate therapy on psoriasis in Hvar, Yugoslavia, which partly preceded the present investigation, showed that the intensity of the psoriatic lesions was more strongly related to the result of the therapy than either the extent of the lesions or the previous course of the disease (101). The intensity would therefore seem to be well suited for use in studying the result of a particular form of therapy.

The course variable, i. e. the severity of the course of the disease during the years, would seem to be well suited for prognostic studies, for example, not least in view of the marked stability in the forms of expression of the disease in the studied psoriatics.

For studies of the need for and consumption of medical care, finally, the subjective experience of the psoriasis and the complaints that the psoriatic associates with the disease would seem to be suitable. For this variable to be defined more clearly, however, more penetrating studies of the psychological factors involved, in particular, are required.

V. JOINT INVOLVEMENT IN PSORIASIS

A. PSORIATIC ARTHRITIS — NOSOLOGICAL ASPECTS

Ever since the simultaneous occurrence of psoriasis and arthritis was described more than 150 years ago, the relationship between these conditions has been discussed. The concept that psoriatic arthritis is a distinct clinical entity has been endorsed by an increasing number of authors in recent years, but has been questioned by some and revoked by others. The idea that there might be an intimate connection between psoriasis and arthritis is based on epidemiological, clinical and roentgenological as well as serological findings. The development of serological methods and the introduction of more precise criteria for the diagnosis of rheumatic conditions has made it possible to analyse this relationship on a more sound basis.

Epidemiological aspects

Many previously published data on the occurrence of joint changes among psoriatics are of rather limited value. This is due chiefly to the lack of information on what criteria have been used and on whether the author has examined the patients in question or derived the data from disease histories in the case journals; further, roentgenological examination has often not been performed. Finally, a major reason for the limitation is that the series have consisted of patients (from hospitals or outpatient departments) and have not been population material. This explains the large variations in frequency figures pub-

lished, from 0.4 % to 32 % (10) — though many authors have given a figure of about 7 % (63, 82). Most authors have not taken the age factor into account, however. An example of the importance of the age factor may be found in the prevalence figures for rheumatoid arthritis given by Lawrence (78). He reported a frequency of 5 % for women and 2 % for men in an English population as a whole. In the age group 55—64 years the figure rose to 12 % for women and 4 % for men.

In his survey of the relationship between psoriasis and arthritis, Baker (10) found a prevalence of psoriasis in subjects with seropositive polyarthritis of 2 %, as compared with 20 % for psoriasis in seronegative polyarthritis; among controls without polyarthritis this figure was 1.5 %. Baker considered that these figures indicated association between psoriasis and seronegative polyarthritis. Psoriasis was not to be regarded as a simple complication of arthritis, any more than arthritis was a complication of psoriasis. Baker also put forward the possibility of a genetic relationship between these conditions, as he found a familial aggregation of psoriasis and seronegative polyarthritis but not of psoriasis and seropositive polyarthritis among patients with psoriasis and seronegative polyarthritis (12). A genetic association has also been discussed by Coste (32) and Wright (153).

The weakness in Baker's investigation was that it was not a population study in the sense that he studied psoriatics randomly selected from a population, but based his ma-

terial on psoriatics registered in hospitals. Furthermore, the non-participation was large (36 %).

In his census study on the Faroe Islands, Lomholt found only three persons out of 253 psoriatics who had clinical changes diagnosed as psoriatic arthritis (90). A considerably larger number had "uncharacteristic rheumatic symptoms", which were not, however, described in detail.

Cats has recently denied a relationship between psoriasis and arthritis (28). From the findings in a population study in Holland he claimed that the presence of polyarthritis and psoriasis in the same individual was only due to chance. He found no difference between the observed number of persons with psoriasis and polyarthritis and the predicted number, calculated on the basis of his population study. Further, in his population material he found twice as many persons with seronegative as with seropositive polyarthritis, in contrast to the reverse in a hospital material. He considered this to imply that a hospital material is selected. The findings might be due to the fact that when psoriasis and polyarthritis appear together the treatment is more difficult and exacerbations last longer.

It is thus clear that population surveys may give different results from studies of series of cases from sectors of the health services, and may give rise to different evaluations.

Clinical and roentgenological aspects

The following characteristics of psoriatic (PA) in comparison with rheumatoid arthritis (RA) have been described (13, 32, 152, 153, 154):

- sex distribution — PA usually more common among men than among women;
- age at onset of joint symptoms — often lower in PA than in RA;
- asymmetry of the joint changes and early involvement of distal interphalangeal joints (DIP);

absence of subcutaneous nodules, which are characteristic for RA;

occurrence of mutilating arthritis and sacro-iliitis.

Distinctive roentgenological features in PA have also been reported. These have been regarded as characteristic, if not completely specific for PA, and distinguishable from the changes in RA (9, 77, 152, 154). The main features reported are destructive arthritic changes in DIP of fingers and toes, destruction of interphalangeal joints in fingers and toes, with a sharp line of demarcation against the adjacent bone, and resorption of the distal phalanges in fingers and toes. Attention has also been drawn to the absence of osteopenia despite arthritic changes, in contrast to the conditions in RA; this has been attributed to the intermittent course of PA.

On the basis of these clinical features, Wright & Moll (154) have classified PA into four main clinical types:

- a) patients with dominating distal interphalangeal arthritis
- b) patients with arthritis mutilans, often combined with involvement of the sacro-iliac joints
- c) patients with a joint pattern quite indistinguishable from rheumatoid arthritis
- d) patients in whom spinal involvement precedes and dominates over peripheral arthritic involvement.

Of especial interest is the relationship between psoriasis and pelvo-spondylitis.

The term pelvo-spondylitis (spondylitis ankylopoietica, spondylarthritis ankylopoietica, Strümpell-Marie-Bechterew's disease) (118) covers both spondylitis, i.e. changes in the vertebral column, and sacro-iliitis. The diagnosis pelvo-spondylitis is mainly established roentgenographically. Some authors consider that in certain cases sacro-iliitis can occur in the absence of pelvo-spondylitis, e.g. uroarthritis (123). Others regard sacro-iliitis as a specific early sign of pelvo-spondylitis, al-

though its absence does not exclude the syndrome (17).

Roentgenological sacro-iliac changes have been reported to occur more often among patients with PA than with RA, and frequency figures of about 20 % have been given in PA (32, 152). The term psoriatic spondylitis was coined by Fletcher & Rose in 1955 (49).

The relationship between psoriasis and pelvo-spondylitis is, however, difficult to evaluate. Wright & Moll (154) have recently stated that "psoriatic spondylitis" should be regarded as an association between psoriasis and ankylosing spondylitis, a clinical combination that occurs too often to be due to chance alone. Reed (115) has claimed that the spondylitis in psoriasis is an "idiopathic ankylosing spondylitis". Jajic (64) is of the opposite opinion, as he found both a marked lack of spinal symptoms and a discrepancy between clinical and roentgenological findings.

Kaplan *et al.* (70) have described changes in the cervical spine in the form of apophyseal alterations, especially sclerosis and calcification of the anterior long ligament, which they considered specific for psoriasis. No evidence of concurrent changes in the sacro-iliac joints was found, however, and these authors were therefore unwilling to regard these lesions as part of a pelvo-spondylitic syndrome.

Bywaters & Dixon (27) observed considerable paraspinal calcification and ossification in the thoracic and lumbar spine in a number of PA patients. Among these patients changes were also observed in apophyseal joints but not in the sacro-iliac joints, and the lesions were therefore considered to differ from pelvo-spondylitis.

A possible linkage between PA and Reiter's syndrome has been discussed by Wright & Reed (155), partly for the reason that the skin lesions in Reiter's syndrome are sometimes indistinguishable from those in pustular psoriasis and partly because sacro-iliac joint changes are common in these conditions.

It is, however, the relationships in male psoriatics that have been discussed throughout. When a series of both men and women has been investigated it has never been stated how the observed changes in the spine and sacro-iliac joints have been distributed between the sexes. One exception is a study based on hospital case journals from periods of care at the Department of Dermatology, Karolinska Sjukhuset, where sacro-iliac joint changes were reported in 30 % of men as against 6 % of women with psoriasis and joint lesions (45). As far as is known there has been no study aimed especially at elucidating these conditions in women. This may be explained by the general opinion that pelvo-spondylitis is essentially a male disease.

Serological aspects

Serological tests for rheumatoid arthritis are based on the demonstration of IgM macroglobulins in the serum, collectively called rheumatoid factors (RF). They appear as antibodies against gammaglobulins, which in this reaction act as antigens (134). The specificity and sensitivity of the tests used for demonstrating RF are dependent upon the carrier particles employed. Of the generally used tests the latex test is considered to be more sensitive but less specific than SCAT (Rose-Waaler test) (147).

The importance of the absence of detectable RF for differentiation between PA and RA has been pointed out by many authors (10, 32, 77, 136, 153, 154), and several have used the absence of detectable RF as a criterion for PA. One difficulty then arising has been how persons with psoriasis and seropositive polyarthritis shall be classified. It has usually been considered that the concurrent manifestation of psoriasis and RA is due to chance, with no close relationship. Wright & Moll (154), however, have recently put forward the view that every case of seropositive polyarthritis with clinical features

typical of PA should be regarded as true PA rather than RA.

Previous opinions that RF were distinctly abnormal serum factors have nowadays been replaced by the view that these antibodies constitute a serological response that all individuals can produce and that the high titre found in typical RA represents strengthening of a response that thus occurs normally (142).

In his epidemiological survey Cats (28) showed that psoriasis occurred in 1.4 % of persons who fulfilled fewer than three of the eleven criteria for RA laid down by the American Rheumatism Association (A.R.A.) (120). If at least three of the eleven criteria are fulfilled, there is a question of possible RA, and if at least five are fulfilled, of probable RA. Of persons satisfying three or four criteria for RA the frequency of psoriasis was 3 % among those with the highest RF titres. The frequency of psoriasis then rose with falling RF titres, reaching 20 % among those in whom no RF were found. There was thus a gradual difference in RF titres between polyarthritic persons with and without psoriasis, and it was thus not valid to speak of persons as seropositive or seronegative.

B. JOINT SYMPTOMS IN GENERAL IN THE EXAMINED PSORIATICS

Have psoriatics many joint symptoms?

Present investigation.

In the analysis of joint changes undertaken in this investigation, the aim was to trace common features in persons with joint involvement, regardless of whether the symptoms should be classified primarily as rheumatoid arthritis or pelvo-spondylitis.

The variable. The questions on joint symptoms in the questionnaire, complemented

TABLE X. Percentage occurrence of joint symptoms among the psoriatics.

	Age groups				Total
	25—29	35—39	45—49	55—59	
Men	25	45	71	55	54
Women	41	41	46	63	46

by interview questions, concerned at first hand whether the person had or had had joint symptoms at all (stiffness, tenderness, aching, pain on movement, swelling, deformity). Joint symptoms clearly due to trauma were excluded (p. 16).

Results. The occurrence of joint symptoms, previously or at the time of questioning, but excluding clearly traumatic symptoms, was reported by 147 (49 %) of the 300 clinically examined psoriatics. The same frequency was found among those who answered the questionnaire but were not personally examined. Of those who reported joint symptoms, 68 were men (54 % of the men) and 79 women (46 %); this difference was not significant (Table X).

At the clinical examination changes in one or several joints were noted among 90 % of those who reported joint symptoms, and 5 % of those who claimed to have no joint symptoms.

Older persons stated that they had present or previous joint symptoms significantly more often than younger persons. This applied to both sexes.

Persons with a more severe form of psoriasis (according to the course variable) reported joint symptoms significantly more often than those with a milder form of psoriasis; the difference was significant for men and almost significant for women. Joint symptoms were not more common among persons with an early onset of psoriasis than in those with a late onset, when the age at the examination was taken into account.

Comments. On evaluation of the case history, the following factors were considered.

Joint symptoms clearly due to trauma were excluded on the basis of information obtained at the interview, i.e. according to the judgement of the examiner. Westrin (145) has recently shown the uncertainty in such assessment in a comparison between the evaluation of back symptoms from a traumatic aspect between two doctors (an orthopaedic and a sociomedical specialist). The orthopaedist considered more back symptoms to be due to traumatic factors than the socio-medical specialist; this was probably due to differences in their opinions on the importance of traumatic factors. Thus it seems probable that the joint symptoms would have been regarded as due to trauma in a larger number of psoriatics in the present investigation if a traumatologist had made the evaluation, especially in view of the relatively low figure of 8 % excluded for this reason.

Another important question is the extent to which the examinee remembers his earlier joint symptoms. In his investigation of sick leave for low back pain, Westrin (145) showed that the memory of back symptoms was only good for the preceding three years. It then deteriorated considerably the longer the interval since the symptoms had occurred. This applied especially to non-recurrent symptoms. This finding gives reason to assume a certain degree of under-reporting in the present study.

The question of whether the psoriatics had more joint symptoms than other persons could not have been answered unless a control group had been asked similarly formulated questions under the same conditions, which was not possible. Certain comparisons with the available control groups (see p. 11) could be made, however.

The ILI controls had a significantly lower frequency of joint symptoms than the psoriatics, when consideration was taken of age. It must be pointed out, however, that these controls had been questioned by special interviewers, and the questions asked concerning

joint symptoms were formulated quite differently from those used for the psoriatics. This comparison is therefore uncertain.

Among the HSSE and HSCC controls joint symptoms were, again, significantly less frequent than among the psoriatics of corresponding age groups (Chapter VII). This comparison is somewhat more reliable, as it is based on similarly formulated questions asked in a questionnaire, which was answered in the same way by these controls and the psoriatics. The questions were, however, of a very general nature compared with the special questions on joint symptoms which the psoriatics were asked to answer in addition.

The introductory question concerning joint symptoms which was used for these special joint questions to the psoriatics was the same as one of the questions concerning joint symptoms which Cobb *et al.*, (29) introduced as so called screening questions. In a questionnaire study of randomly selected persons in the Stockholm region, and using these screening questions suggested by Cobb *et al.*, Allander (2) found a clearly lower frequency of joint symptoms in the population than was found in the psoriatics of the present study.

These findings would seem to indicate that joint symptoms are common in psoriatics and perhaps more common than in other people. It must be strongly emphasized here, however, that this is a case of a hospital material of psoriatics being compared with non-hospitalized controls. If, in addition to psoriasis, a person also has other disease manifestations, such as joint symptoms, it is conceivable that this will increase the probability that he or she will be admitted to hospital for care of the psoriasis. This in turn would mean that in a hospital material of psoriatics a higher frequency of joint symptoms would be found than among psoriatics who have not received hospital care for their psoriasis. Depending on the degree of joint symptoms in relation to the severity of the skin lesions, the psoriatic may be admitted either to a department

of dermatology or a department of rheumatology. This problem will be discussed in a later section of this book.

C. PSORIATIC ARTHRITIS

It is clear from the foregoing that the joint involvement in psoriasis is localized to two main regions:

- (i) peripheral joints
- (ii) sacro-iliac joints and the vertebral column.

The criteria used in this investigation for studying the psoriatic arthritis syndrome more closely were therefore directed towards these regions.

Criteria for peripheral arthritis

1. in the case history, arthritis observed and treated by a physician
2. a previous or current episode of joint pain involving three or more peripheral joints, without stipulation of duration
3. swelling (of soft tissues or from joint effusion, but not from bone proliferation) and pain or tenderness on movement in one peripheral joint, observed at the examination
4. *idem* in at least three peripheral joints, observed at the examination
5. definite erosive changes roentgenologically (grade 2 or higher).

The joints on each side were counted separately. Joints occurring in groups, such as the proximal interphalangeal joints (PIP) or metacarpophalangeal joints (MCP) were counted as one joint (joint group), even if more than one of the individual joints in the group were involved on each side.

Criteria for pelvo-spondylitis

1. pain in the lumbar spine for at least 3 months

2. aching or stiffness in the thoracic or lumbar spine
3. limited movement of the lumbar spine anteriorly, posteriorly and laterally
4. chest expansion on inspiration less than 2.5 cm
5. definite erosive changes (grade 2 or higher).

Comments. As pointed out several times previously, the present series was a hospital material and not a population material. In view of the situation that the psoriatics were not to be regarded as patients who had sought advice for joint symptoms, it was considered justifiable to use criteria formulated for epidemiological use. As these criteria had been developed from clinical data, this did not strictly imply any major difference, however.

The clinical criteria that were used for peripheral arthritis were mainly based on the criteria for rheumatoid arthritis that had been suggested for epidemiological surveys (18, 71), with the exception of the demand for symmetry and the exclusion of the distal interphalangeal joints (DIP). In this form the criteria can be used for the other forms of peripheral arthritis (81).

Peripheral arthritis in psoriatics can have its onset monoarthritically (124). This is taken into account in criterion 3. The possibility of gout or so called pseudo-gout must be considered here, however. The difference between a mild crystal synovitis and mild polyarthritis may be difficult to establish (74, 92).

Another source of error, that is certainly of greater importance, is osteoarthrotic changes, especially in the distal interphalangeal joints. These changes are common at that site and may be misdiagnosed as distal arthritis, especially if roentgenological examination has not been performed.

The criteria for pelvo-spondylitis were in agreement with those proposed for epidemiological use (18).

The relative values of the clinical criteria for pelvo-spondylitis have been studied by

TABLE XI. Selection of psoriatics with arthritis (number of individuals). In step 2 the number of persons shown roentgenologically to have arthritis out of those X-rayed in the clinical groups (step 1) is given.

	Age groups								Total	
	25—29		35—39		45—49		55—59			
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
<i>Step 1: clinical selection</i>										
Arthritis clinically	0	2	4	2	8	2	5	4	17	10
Other back symptoms	2	8	5	7	11	6	7	4	25	25
Unclassified peripheral joint symptoms	3	19	4	12	11	13	14	10	32	54
No joint complaints or symptoms	15	37	9	20	11	18	18	9	53	84
Total	20	66	22	41	41	39	44	27	127	173
<i>Step 2: roentgenological selection</i>										
Other back symptoms	1/2	4/7	0/3	2/6	1/9	2/5	0/6	0/2	2/20	8/20
Unclassified peripheral joint symptoms	1/3	2/11	0/3	2/9	3/10	2/11	0/11	3/8	4/27	9/39
No joint complaints or symptoms	1/8	4/19	2/5	1/10	3/6	1/9	2/8	0/7	8/27	6/45
Total	3/13	10/37	2/11	5/25	7/25	5/25	2/25	3/17	14/74	23/104

TABLE XII. The result of selection of psoriatics with arthritis according to the criteria used, with distribution into age and sex. Number of individuals. The number of persons X-rayed within each group is given in parentheses.

	Age groups								Total	
	25—29		35—39		45—49		55—59			
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
Arthritis	3 (3)	12 (12)	6 (6)	7 (7)	15 (14)	7 (6)	7 (6)	7 (7)	31 (29)	33 (32)
Non-arthritic joint symptoms	3 (3)	21 (12)	9 (6)	12 (11)	18 (15)	15 (12)	21 (17)	11 (7)	51 (41)	59 (42)
No apparent joint involvement	14 (7)	33 (15)	7 (3)	22 (9)	8 (3)	17 (8)	16 (8)	9 (7)	45 (21)	81 (39)
Total	20 (13)	66 (39)	22 (15)	41 (27)	41 (32)	39 (26)	44 (31)	27 (21)	127 (91)	173 (113)

TABLE XIII. Distribution of fulfilled criteria at the selection of psoriatics with arthritis.

Age at the examination		Criteria for peripheral arthritis					Criteria for pelvo-spondylitis					SCAT	Degree of severity of course of the psoriasis
		1	2	3	4	5 ^a	1	2	3	4	5 ^a		
<i>Men</i>													
28	x ^c		1			1					ne ^b	0	2
28	x										1	0	1
29	x						1	1			1	8	4
35	x										1	0	3
37			1		1		1	1	1		1	16	3
37			1		1			1			1	0	2
38		1	1		1	1	1	1	1		1	32	3
39	x										1	8	2
39		1	1		1	1	1	1	1		1	8	4
45	x						1	1			1	0	1
45	x										1	0	3
46	x		1								1	32	2
47		1	1		1	1		1	1		1	16	2
47			1		1	1			1		1	32	2
47	x										1	0	2
47		1	1		1							256	2
47	x										1	0	2
48	x							1			1	8	2
48			1		1	1	1		1		1	8	3
48		1	1		1	1	1	1			1	0	4
48	x		1	1							1	0	1
49		1	1	1		ne	1	1			1	16	3
49		1	1		1							256	4
49		1	1		1	1	1	1	1		1	8	3
55	x										1	0	3
56	x										1	8	1
56		1	1		1	1		1	1		1	8	2
56		1	1		1	1	1	1	1		1	0	2
57		1	1		1	ne	1	1	1		ne	128	2
59				1		1					1	0	1
59			1		1			1	1		1	512	2

^a criteria for peripheral arthritis and pelvo-spondylitis; see text p. xx.

^b not examined

^c included in the arthritis group at the second (roentgenological) phase of the selection

Bennet & Burch (17). They considered limitation of chest expansion on inspiration and limited movement of the lumbar spine to be of greatest value. The occurrence of iritis, which had been previously included as a criterion (71), they considered of little importance. Scandinavian investigations, among others, have shown, however, that iritis can occur in patients with pelvo-spondylitis in a frequency as high as between 16 % (69) and 41 % (107).

Selection of arthritis

The selection of persons with arthritis was undertaken in two steps, a clinical and a roentgenological (Table XI).

At the clinical examination 27 persons (17 men and 10 women) were considered to have (or have had) arthritis, i.e. to fulfil at least one of the given criteria for peripheral arthritis. Those who at the examination fulfilled one or more of the clinical criteria for spond-

TABELL XIII. (Forts.)

Age at the examination	Criteria for peripheral arthritis					Criteria for pelvo-spondylitis					SCAT	Degree of severity of course of psoriasis	
	1	2	3	4	5	1	2	3	4	5			
<i>Women</i>													
25	x						1				1	0	1
25		1		1							1	8	1
25	x						1				1	0	2
26	x										1	0	1
26	x		1								1	0	1
26	x										1	0	1
26	x						1				1	16	1
27	x										1	0	2
28	x										1	8	1
28	x										1	0	1
29	x										1	0	1
29		1		1				1				0	2
37	x	1					1	1			1	64	1
37	x					1	1				1	0	1
37				1		1	1	1			1	0	2
39	x					1	1				1	0	1
39	x										1	32	1
39	x		1								1	0	1
39		1	1		1						1	0	1
46	x							1			1	0	1
46	x		1					1			1	32	2
46		1	1		1			1			1	16	1
46	x										1	0	2
46	x					1			1			0	1
47	x		1								1	8	1
49		1	1		1	ne	1	1	1		ne	64	2
55	x		1				1	1			1	8	1
56	x		1					1	1		1	0	2
57			1					1				0	1
57	x		1		1			1			1	128	1
58		1	1		1	1	1				1	32	1
58		1	1		1	1					1	0	1
59		1	1		1		1	1	1			16	1

ylitis also fulfilled at least one criterion for peripheral arthritis. No person was included in the arthritis group solely by satisfying criterion 3 for peripheral arthritis.

Fifty persons, 25 men and 25 women, had back symptoms that did not satisfy the criteria for spondylitis, and 86 persons, 32 men and 54 women, had unclassifiable peripheral joint symptoms.

At the roentgenological joint examination, which did not include the whole material, de-

finite erosive changes were noted in 19 of the 27 who had already been judged to have arthritis, in 10 of the 50 who had been classified as having other back symptoms, in 13 of the 86 with unclassifiable peripheral joint symptoms and in 14 of the 137 who were considered to have no clinical joint changes.

The results of the selection are summarized in Tables XII and XIII. The group with arthritis thus comprised 64 persons, the group with non-arthritic joint symptoms 110 per-

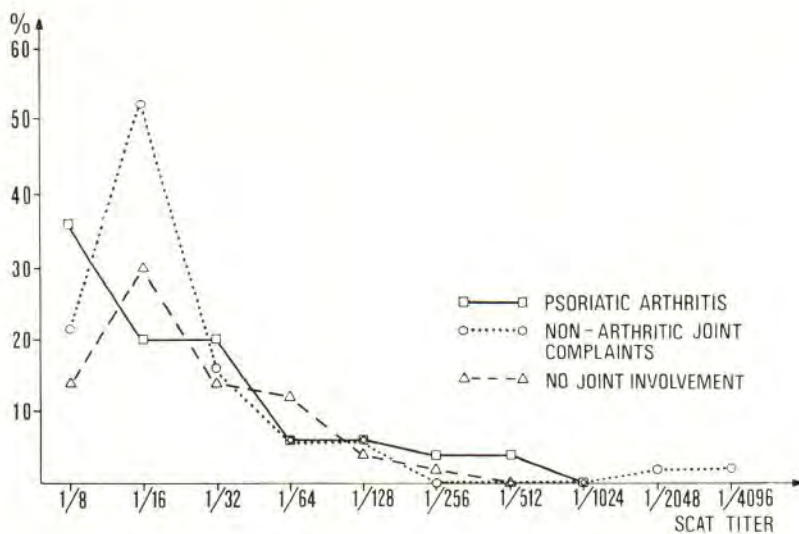


Fig. 5. The result of SCAT among psoriatics with arthritis, with non-arthritic joint involvement and with no joint involvement. In percent (n = 64, 110 and 126 respectively).

sons and the group with no apparent joint changes 126 persons.

Serology

The variable. For demonstrating the rheumatoid factor (RF), SCAT (Rose-Waaler's test) was used. This has been described in detail by Svartz (134). According to the norms of the laboratory a titre of 1/64 was regarded as weakly positive and a titre of 1/128 or higher as positive.

Results. In Fig. 5 the results of SCAT are given for persons in the arthritis group and also for persons with non-arthritic joint symptoms and those with no apparent joint involvement. A similar distribution of titres was found within the three groups. There was no sex difference, and men and women are therefore presented in combination in the figure. A titre of 1/64 or higher was noted in 9 % of the examined psoriatics. A titre of 1/128 or higher was noted in 4 (7 %) of the persons with arthritis, in 5 (5 %) of persons with non-arthritic joint symptoms, and in 4 (3 %) of those without apparent joint in-

volvement. These differences were not significant.

Comments. In large population studies RF has been found in 1 to 9 % of the population in different parts of the world (79, 140). Allander recently reported a figure of 2 % in a control material for persons with rheumatoid arthritis in the Stockholm region (2). The corresponding figure for the whole of the examined psoriatic material was 4 %, which lies within the expected limits. There was no significantly higher frequency of higher RF titres among persons who were evaluated clinically or roentgenologically to have arthritis compared with those without arthritis. This is in agreement with the previous investigations cited above.

RF has been shown to be related to age. A positive RF is more common in older than in younger persons (57, 143). This was also noted in the examined psoriatic material, where titres of 1/64 or higher were noted in 77 % of persons in the two oldest age groups. The presence or absence of arthritis made no difference in this respect.

One weakness in the investigation was that the test (SCAT) that was used in our laboratory was not compared with that used in other laboratories, as has been recommended at the latest symposia on studies of rheumatic diseases in Rome 1961 (71) and New York 1966 (18), as well as by others.

Frequency of arthritis

Results. The frequency of arthritis found in the entire clinically examined material was 24 % for men and 19 % for women

Table XII gives the number of persons in each group who were examined roentgenologically. If it is assumed that the distribution of roentgenologically observed erosive joint lesions was the same among those who were X-rayed as among those who were not, then it may be assumed that 6 persons (1 man and 5 women) with arthritis were missed among persons with non-arthritic joint involvement who were not X-rayed, and that 10 persons (5 men and 5 women) were missed among persons with no apparent joint involvement who were not X-rayed.

The assumed frequency of arthritis in the clinically examined material would thus be 27 % in the men and 25 % in the women.

Comments. The assumption underlying the above calculation was based on the following variables: age at the examination, age at onset of psoriasis, duration of psoriasis, degree of severity of the course of the psoriasis, extent and intensity of the psoriatic lesions at the examination, civil state, social class, and sick benefits received and time on the sick-list during the 5-year period 1965—69. For none of these variables were significant differences found. For those who had joint symptoms a comparison was also made of the number of joints involved and the duration of joint symptoms; no differences were found.

This lack of differences in the above variables says nothing, of course, about the arthritis frequency as such. But it gave support to

the assumption that the frequency of arthritis did not differ between persons who were X-rayed and those who were not.

The frequency figures for arthritis obtained here are high compared with earlier reports (see p. 37). This may well be due to differences in composition of the different materials.

Sex distribution

Previous investigations. Among patients with psoriasis and arthritis Baker *et al.* (13) found a higher preponderance of females (ratio of men:women 8:45) than is usually seen in rheumatoid arthritis (1:3). In most series of psoriasis with arthritis there is a certain preponderance of men (32, 115, 149, 150, 151, 153), but the same frequency in the two sexes has also been reported, e.g. from this clinic (45).

Present investigation.

Results and comments. In this series of psoriatics the ratio of men:women was 1.2:1. If there is a close relationship between psoriasis and arthritis, a male predominance should be expected in so far as the skin disease was considerably more severe among the men than among the women, but such predominance was not found.

Age at onset of joint symptoms

Previous investigations. The arthritis in psoriasis has been claimed by certain authors to have its onset at a younger age than rheumatoid arthritis. The highest relative age incidence for rheumatoid arthritis is found in the age group 40—50 years, while psoriatic arthritis usually appears at ages between 20 and 50 years (116, 148, 149, 151). Other authors report, however, that there is no significant difference between the age at onset of arthritis in psoriasis and rheumatoid arthritis (13, 52). One exception in the arthritis that develops into arthritis mutilans, where

the joint symptoms are usually first manifested at a young age (13). Wood (148) reported an earlier onset of joint symptoms in women than in men with psoriasis, which has not been mentioned by the other authors cited.

Present investigation.

Results. The age at onset of joint symptoms among persons in the arthritis group was closely related to the age at examination (highly significantly) and similarly to the age at onset of the psoriasis (significantly); the latter relationship also held when the age at examination had been taken into consideration. It was lower for women than for men, for example when the mean value (29 ± 12 years for men, 27 ± 11 years for women) or the median value (33 years for men, 24 years for women) was compared. When the age at examination was taken into consideration in the same way as in studies of the age at onset of the psoriasis (see p. 25), on the other hand, no significant sex difference was obtained.

Time relationship psoriasis/arthritis

Previous investigations. In the majority of cases the skin eruptions precede the joint symptoms, the interval between these onsets varying from about one year to several decades (13, 116, 149, 150). In 15—25 % of the cases the psoriasis and joint symptoms are manifested almost simultaneously, and in about the same percentage the joint symptoms precede the psoriasis (13, 115, 149, 150).

A time relationship between deterioration and improvement, respectively, of the skin eruptions and the joint symptoms is reported to be typical of the arthritis in psoriasis (13, 153).

Present investigation.

Results and comments. Fourteen percent of the men and 24 % of the women stated that

the joint symptoms had begun at least two years before the skin eruptions, while 71 % of the men and 68 % of the women stated that the skin eruptions had preceded the joint symptoms by at least two years.

A simultaneous onset of joint symptoms and psoriasis was thus not so common. This is in agreement with the findings of Wright & Moll (154), but contrasts with other previous results (13, 149).

Simultaneous improvements and deteriorations, respectively, of the psoriatic eruptions and joint symptoms were reported by 52 % of the men and 24 % of the women. This was more common among persons with skin eruptions of mainly the nummular type than among those with mainly large plaques.

When evaluating information of this kind, which usually concerns events far back in time, it must be considered as rather uncertain. For this reason the borderline between simultaneous and non-simultaneous onset of joint symptoms and psoriatic eruptions was placed at two years. Information on the onset and changes of the skin disease was considered to be probably more reliable than information on the onset and changes of the joint symptoms. As mentioned previously, a relatively poor memory concerning joint complaints has been shown by Westrin (145). It may be discussed whether the skin eruptions have stronger emotional effects than the joint symptoms. If this were so, it might result in more reliable information on time relationships as regards the psoriasis.

Familial occurrence of joint symptoms

Previous investigations. A familial aggregation of polyarthritis among persons in families of psoriatics with arthritis has been described, among others, by Baker *et al.* (12), which has been considered to support the view of a close relationship between psoriasis and arthritis.

Present investigation

Results and comments. Nine men (31 %) and 4 women (12 %) of the persons in the arthritis group stated that joint complaints of the "rheumatoid arthritis type" occurred in the family (parents, siblings). Half of these family members with "rheumatoid arthritis" also had psoriasis. More severe forms of joint complaints in persons in the arthritis group were not associated with a higher incidence of joint symptoms in the family.

Family members stated to have "rheumatoid arthritis" were not examined personally in the investigation. The reported joint complaints probably also included other types of joint symptoms than pure polyarthritis, especially osteoarthrotic symptoms. The high incidence of "rheumatoid arthritis" reported in members of families of persons in the arthritis group as compared with the other psoriatics in the material may have been due to a true higher incidence of joint symptoms — polyarthritis as well as other types. It must be assumed, however, that persons who themselves suffer from joint complaints are more likely to know of and report the occurrence of joint symptoms in the family than persons who have had no joint complaints. Thus in the present series of psoriatics a familial occurrence of "rheumatoid arthritis" was more common among persons who had joint complaints of some kind than among those who denied having such complaints.

Anamnestic joint symptoms

Results and comments. According to the information given in the questionnaire and at the interview in connection with the investigation, the most common symptoms were pain, either permanent or transitory (69 % of the men and 61 % of the women), pain on movement (62 % of the men and 36 % of the women), and stiffness of the joints, specified as morning stiffness (59 % of the men and 58 % of the women). As regards

the localization of the symptoms, the finger joints were reported to have been involved in 66 % of the men and 48 % of the women, the shoulders and wrists in 50 % of the men and 45 % of the women, the lumbar spine in 45 % of both men and women, and the cervical spine in 41 % of the men and 36 % of the women.

Thus the occurrence of joint symptoms, both qualitatively and as regards distribution, was relatively equal among men and women in the arthritis group. No attempt was made to evaluate the degree of severity of the joint symptoms on the basis of anamnestic information, except from a functional aspect (see below).

Clinical findings at the joint examination

The variables. The clinical investigation of the joint involvement included the following variables: swelling, tenderness, pain on movement, stiffness, limited movement, subluxation and ankylosis.

Results. Swelling was seen mainly in the proximal and distal interphalangeal joints of the hands and the metacarpophalangeal joints (27 % of all PIP joint groups examined and 16 % of DIP, and 13 % of the MCP joint groups; Table XIV). Swelling was less common in the corresponding joints of the feet (3—6 %). This symptom was more frequent in men than in women, but the difference was not significant.

Tenderness and pain on movement were noted relatively often in the same joint, and occurred in 31 % of all examined PIP and 21 % of DIP in the hands. These symptoms occurred in the wrists, MCP, ankles, MTP and PIP and DIP in the feet in 8—15 %, and in the lumbar and cervical spine in 24 % and 5 %, respectively. Tenderness was more common in women than in men, while the reverse was found for pain on movement (significant).

Stiffness, specified as a feeling of stiffness in the joint without any objectively noted

TABLE XIV. Comparison between clinical and roentgenological involvement of certain joints in the hands among psoriatics with arthritis and persons with rheumatoid arthritis. The figures for the latter are cited from Allander (2), with permission. The figures are given in percent, based on the total number of joint groups examined within the PA group and in the RA material (128 and 586 joint groups, respectively).

	PA			RA		
	MCP 1-5	PIP 2-5	DIP 1-5	MCP 1-5	PIP 2-5	DIP 1-5
<i>Clinical findings</i>						
swelling	13	27	16	57	20	4
tenderness	14	31	21	44	18	7
pain on movement	15	30	19	60	36	15
limited movement	17	22	26	21	19	14
subluxation	6	6	14	10	7	5
ankylosis	2	2	3	1	1	2
<i>Roentgenological findings</i>						
reduction of joint space	9	6	8	28	7	13
erosion grade 2 ^a	3	3	2	(15	11	16)
3	6	3	2	(14	13	9)
4	3	3	5	(7	8	2)
total	12	10	10	36	32	27
subluxation	2	2	2	12	5	4
ankylosis	0	0	2	1	1	0
osteoarthritis	4	6	14	33	26	54

^a gradation of erosions approximately comparable

limitation of movement, occurred in 23 % of all examined PIP and in 13 % of DIP in the hands, in 20 % of the wrists and in 23 % of the ankles. Further, this symptom was found in 27 % in the lumbar spine and in 13 % in the cervical spine. Stiffness was not significantly more common in women than in men.

Limitation of movement was noted in 26 % of all examined DIP, 22 % of PIP, and 17 % of MCP in the hands. DIP of the feet were involved in 16 % and PIP in 10 %, and to the same extent MTP 1, MTP 2—5 and the ankles (8—11 %). Limitation of movement was more common in men than in women; this difference was highly significant.

Subluxation occurred in 14 % of the examined DIP and 6 % of PIP and MTP in the hands. In the feet, this symptom was found to approximately the same extent in DIP, PIP, MTP 1 and MTP 2—5 (4—6 %).

Ankylosis was observed only in occasional peripheral joints, corresponding to 1—2 % of all joints examined. Both subluxation and ankylosis were more common in men than in women.

Clinically the joint involvement was more pronounced throughout among men than among women, and symptoms which meant a functional limitation of the joints were more common among men.

The influence of age on the clinical symptoms was more marked among women than among men. Among the men, swelling and tenderness were more frequent in younger than in older persons, while limitation of movement was more frequent in older than in younger persons (significant difference). No significant age differences were found for the other symptoms. Among the women, on the other hand, all symptoms were more common in older than in younger persons (significant difference), except tenderness of the joints, which occurred equally often in younger and older persons.

Comments. Some degree of uncertainty is attached to all the clinical variables studied here. Concerning joint swelling, O'Sullivan found as low agreement as only in 17 % between two observers at an examination of joint changes in a large series (110). Furthermore, joint swelling is more easily observed in certain joints, e.g. PIP and MCP, than in others, e.g. the ankle, where oedema, especially, but also adipose tissue may influence the evaluation (2, 80).

The concept of pain, and also tenderness, is very complex. Both symptoms are considered to have a low specificity and, further, to be closely related (2, 26, 75). The degree of pressure applied to a joint has been shown to vary considerably between different

examiners, though the variation in the same examiner between different examinations is not so large (117).

The subjective experience of stiffness differs greatly from the joint stiffness that can be recorded objectively (138). The concept of stiffness which was used as a clinical variable in this study and which was specified as a feeling of stiffness in the joint without noticeable limitation of movement, was thus completely subjective. Further, it did not correspond to any of the clinical symptoms that are found among the recommended criteria for arthritis (18, 71). The reason for inclusion of this concept in the present investigation was that the author had the impression that joint stiffness was strikingly common in psoriatics, which has also been pointed out by Wright (149).

The reproducibility of limitation of movement has also been shown to be low (83), though this variable is less subjective than, for example, joint swelling (2).

It may also be pointed out once more here that when, as in this study, information on clinical findings is referred from single joints to joint groups, some errors are introduced (2). The joint group will thus show more pathological findings than will be shown by the individual joints within the group. However, the use of the joint group concept means considerable advantages in an analysis of the large amount of data involved in a joint study such as this.

Clinical pattern

Results. On comparison between the involvement of so called RA joints (i. e. joints that are considered to be typically involved in rheumatoid arthritis, p. 18) and of so called non-RA joints (i. e. joints that are not considered to be typically involved in rheumatoid arthritis) in the arthritis group of the present study, symptoms of functional limitation such as limited mobility were found

somewhat more often in non-RA than in RA joints.

In Fig. 6 the distributions of clinically involved joints noted in men and women in the different age groups are presented. The figure gives the number of persons in the arthritis group in whom clinical symptoms were recorded for the different joints. Those joints in which stiffness was the only symptom noted are indicated separately. The reason for this is that stiffness, as mentioned above, is not included among the "accepted" symptoms (18).

It can be seen in the figure that as regards the finger joints in men, involvement of DIP was just as frequent as that of PIP and MCP. In women in the oldest age group involvement of DIP was more common, but in the other age groups less common than involvement of PIP or MCP.

In Table XV the relationship between clinical involvement of PIP and DIP is shown. Among both men and women involvement of DIP without simultaneous involvement of PIP was more common than both involvement of DIP and simultaneous involvement of PIP and DIP.

Further, in most cases simultaneous involvement of PIP and DIP was combined with involvement of MCP.

Of those who had symptoms from joints of the hands and/or feet, the changes in 76 % of the cases were of the same or almost the same type and severity (with no sex difference).

Functional aspects

The variables. The influence of the joint changes on the functional capacity of the examinee was evaluated by means of two variables: a) the examinee's own subjective opinion of his joint complaints, and b) the classification used by Steinbrocker *et al.* (131) (see p. 17).

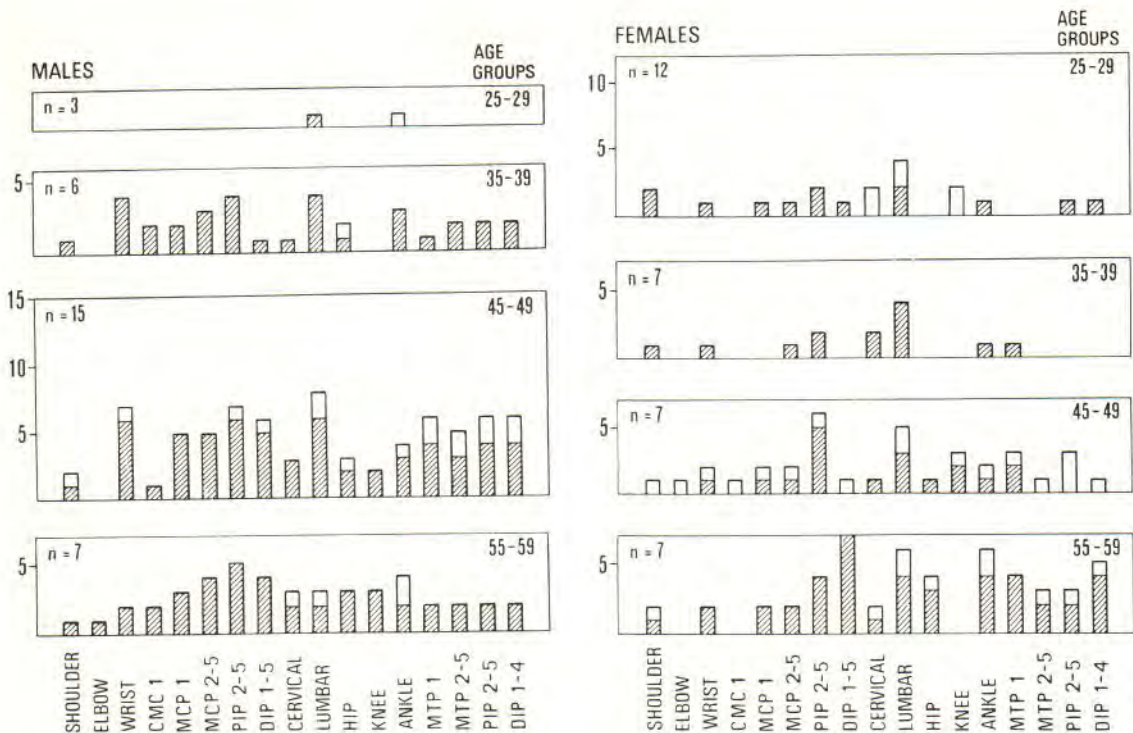


Fig. 6. Distribution of clinically involved joints among male and female psoriatics with arthritis in the different age groups. The figure gives the number of persons with joints affected by swelling, tenderness, pain on movement, limitation of movement, subluxation or ankylosis (▨) and by stiffness alone (□).

TABLE XV. Clinical involvement of PIP and DIP of the hands and feet (stiffness not included). In percent.

Clinical involvement		Men	Women
PIP	DIP	n= 13	n= 33
+	+	24	24
+	—	28	15
—	+	41	52
—	—	7	9
		100	100

Results. The subjective complaints were reported to be "none" or "slight" by 62 % of the men and 76 % of the women, and "moderat" by 21 % of the men and 24 % of the women. Five percent of the men and none of the women considered their joint complaints to be "great".

TABLE XVI. Roentgenological involvement (erosions) of PIP and DIP of the hands and feet. In percent.

Grade of erosion		Men	Women
PIP	DIP	n= 29	n= 32
0-1	0-1	63	94
0-1	0-1	8	0
0-1	2	0	0
2	3-4	0	0
2	0-1	4	0
2	2	0	0
3-4	0-1	4	3
3-4	2	0	0
3-4	3-4	22	3
		100	100

The functional capacity as classified by Steinbrocker *et al.* was evaluated as complete or adequate for normal activities in 71 %

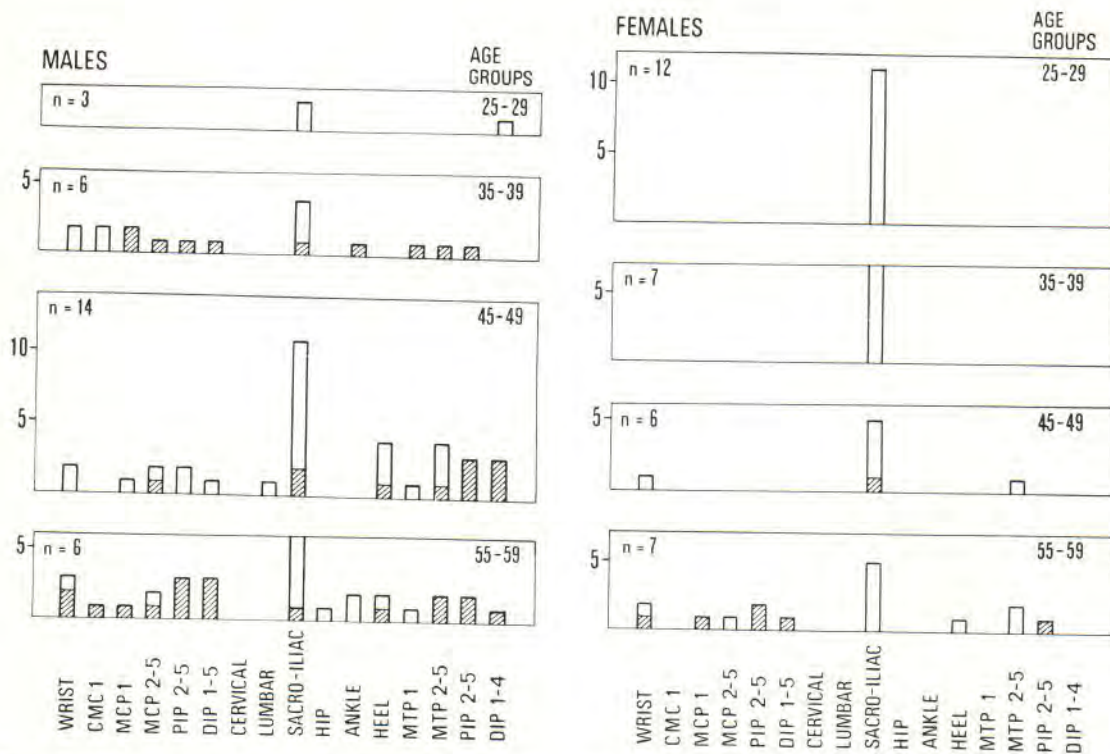


Fig. 7. Distribution of roentgenologically involved joints among male and female psoriatics with arthritis in the different age groups. The figure gives the number of persons with joints with minimal erosions (grade 2) (□) and with more severe erosions (grade 3 or 4) (▨).

of the men and in all women. In 29 % of the men (6 cases) the functional capacity was considered to be limited. None of the examinees were incapacitated.

Thus from a functional aspect the joint involvement was not of great importance for the persons in the arthritis group.

Both the subjective experiences of the joint complaints and the functional capacity as classified by Steinbrocker *et al.* were, however, related to age—the older the examinee the greater the subjective joint complaints, and the greater the functional limitation. This applied equally to both sexes.

Comments. The two variables measure partly the same conditions, but do not completely overlap. In both cases not only purely medical but also social factors play a role. The

functional capacity, as evaluated by the method of Steinbrocker *et al.* (131), is relevant mainly for persons with manual work. For persons with other types of occupations, e.g. office workers, housewives, it is much more difficult to obtain a comparative form of evaluation. This is the great weakness in Steinbrocker's variable, but it was used here for lack of a more adequate method. By adding the examinee's subjective opinion of his or her joint complaints an extended evaluation of the functional conditions was obtained.

Steinbrocker's variable applied in principle to the time of the follow-up, while the subjective opinion of the joint complaints was probably coloured by the conditions during varying intervals prior to the follow-up.

TABLE XVII. Occurrence of sacro-iliitis in psoriasis.

	Men	Women
No. of persons with sacro-iliac joint erosions (grade 2 or more)	24	28
In percent of X-rayed persons with arthritis (whole arthritis group)	83 %	88 %
In percent of X-rayed persons with peripheral arthritis	69	58
In percent of X-rayed persons with psoriasis	26	25
In percent of the whole psoriasis material	19	16
In percent of the whole psoriasis material when taking into account the assumed number of undiscovered cases of sacro-iliac joint erosions	24	22

TABLE XVIII. Clinical and roentgenological involvement of peripheral joints and sacro-iliitis. In percent.

Sacro-iliac joints	Peripheral joints	Men n = 29	Women n = 32
<i>Clinical involvement</i>			
+	+	41	47
+	-	39	44
-	+	20	9
-	-	0	0
		100	100
<i>Roentgenological involvement</i>			
+	+	31	13
+	-	48	78
-	+	7	0
-	-	14	9
		100	100

Roentgenological findings at the joint examination

The variables. The analysis of the roentgenological changes that occurred among the psoriatics in the arthritis group comprised the following variables: reduction of joint space, erosion, delimitation of erosion, subluxation and ankylosis and also osteopenia and osteoarthrosis (OA). The main interest was focused on the erosive changes. The gradation of the variables has been described previously (p. 21).

Results. In general, most of the definite erosive changes (grade 2 or more) were loca-

lized to so called non-RA joints. In Fig. 7 the distribution of joints with erosive changes among men and women in the different age groups is presented. The figure gives the number of persons in the arthritis group in whom erosions were noted in the different joints.

It is evident from the figure that erosive changes occurred equally often in PIP as in DIP. In women, however, erosions in peripheral joints were rare. The relationship between PIP and DIP involvement is shown in Table XVI. It can be seen here that in most persons with erosive changes in the interphalangeal joints there was simultaneous involvement of PIP and DIP.

The most striking feature in Fig. 7, however, is the erosive changes that were found in the sacro-iliac joints. It is seen that these changes were equally common among men (26 %) and women (25 %) (Table XVII). The erosions were mainly moderate; only in 5 cases (4 men and 1 woman) were they graded as severe (grade 3-4).

In 41 % of the men and 47 % of the women with erosive changes of the sacro-iliac joints, clinical involvement of peripheral joints was also found. In only 20 % of the men and 9 % of the women was there clinical involvement of peripheral joints without simultaneous changes of the sacro-iliac joints.

Simultaneous occurrence of erosive sacro-iliac joint changes and erosive changes in peripheral joints was rather less common and was found in 31 % of the men and 13 % of the women. In only 7 % of the men and in none of the women were erosive changes seen in peripheral joints without erosions being present in sacro-iliac joints.

In the arthritis group changes in the sacro-iliac joints were thus often found among persons with peripheral arthritis.

In Table XVIII the relationship between erosions in peripheral and in sacro-iliac joints is presented.

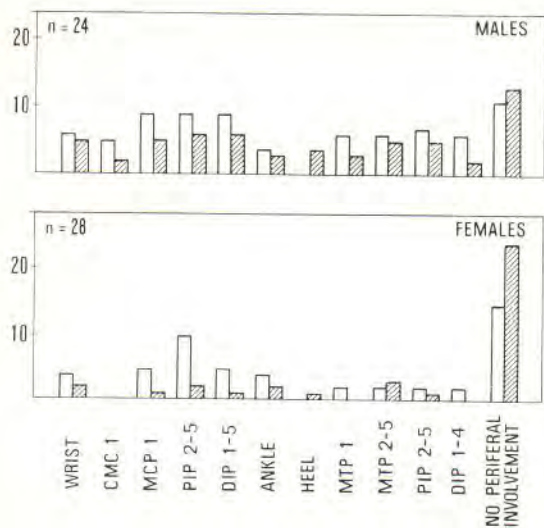


Fig. 8. Distribution of clinical and roentgenological involvement of peripheral joints among male and female psoriatics with sacro-iliitis. The figure gives the number of persons with clinical involvement (swelling, tenderness, pain on movement, limitation of movement, subluxation or ankylosis) (□) and with roentgenological involvement (erosions of grade 2 or more) (▨).

The distribution of peripheral joint changes, both clinical and roentgenological (erosive), among persons with erosions in the sacro-iliac joints is shown in Fig. 8. Among the men DIP, PIP and MCP in the hands were involved in an equal frequency, and usually simultaneously, while among the women involvement of PIP was more common than that of PIP and MCP.

All persons with erosions on the dorsal surface of the calcaneus at the attachment of the Achilles tendon, except one, had simultaneous changes of the sacro-iliac joints.

The changes in peripheral joints occurred to a large extent simultaneously on the right and left side. When recordings for joint groups were used, the erosive changes were bilateral and of the same grade in 91 % of all joint groups with erosive changes. When, on the other hand, each small joint was compared separately, the changes were bilateral and

of the same grade in 66 % of all individual peripheral joints with erosive changes. There was no sex difference in this respect.

The erosions were unilateral in 14 % of the sacro-iliac joints with erosive changes. In the remaining cases they were bilateral and were judged to be of the same degree of severity. Again, there was no sex difference in this respect.

None of the examined psoriatics showed the previously described roentgenological changes that have been claimed to be characteristic for psoriasis (9, 27, 70).

The arthritis in peripheral joints was characterized by an almost similar distribution between so called RA and non-RA joints. In no case were isolated changes in DIP observed. Neither were there any destructive lesions. The most marked erosions in peripheral joints occurred in persons with simultaneous erosions in the sacro-iliac joints.

Changes in the cervical and lumbar spine were sparse. Only one person exhibited calcification of the anterior longitudinal ligament in the cervical spine with a suggestion of "bamboo rod formation" in association with sacro-iliac joint changes. The cervical spine was only examined roentgenologically, however, in about one-third of the psoriatics, but these included all persons who had complaints from the cervical spine.

The erosive changes in peripheral joints showed a clear relationship to age and occurred sparsely at younger ages (Fig. 7). In sharp contrast to these were the changes in the sacro-iliac joints, which were of equal frequency in all age groups.

Narrowing of the joint space was found in peripheral joints in 28 % of the men and 3 % of the women, and in sacro-iliac joints in 35 % of the men and 25 % of the women. In peripheral joints narrowing of the joint space occurred mainly in association with more pronounced erosive changes, while in sacro-iliac joints it was also seen with less severe erosions.

TABLE XIX. Gradation of roentgenograms of sacro-iliac joints with respect to erosive changes (29 men and 27 women from all age groups). Comparison between professor John S. Lawrence, Manchester, and Assistant Professor Nils Lindvall and the author.

Gradation according to Lawrence	Gradation according to Lindvall and the author				Total
	None, doubtful	Minimal	Moderate	Severe	
None	40	3	0	0	43
Doubtful	2	5	1	0	8
Minimal	0	4	0	0	4
Moderate	0	0	0	0	0
Severe	0	0	0	1	1
Total	42	12	1	1	56

TABLE XX. Examination of sacro-iliac joint erosions among comparative materials from population studies in Leigh and Wensleydale, England (selection and gradation by Professor John S. Lawrence) and from the Department of Diagnostic Radiology of Karolinska Sjukhuset, Stockholm (selection from urograms, gradation by Assistant Professor Nils Lindvall and the author).

Comparative materials	n	Gradation of erosion				
		None	Doubtful	Minimal	Moderate	Severe
<i>From Leigh and Wensleydale</i>						
Men	30	29	1	0	0	0
Women	29	25	4	0	0	0
<i>From Karolinska Sjukhuset</i>						
Women						
25—29 yrs	26	24	1	1	0	0
35—39 yrs	26	26	0	0	0	0

The erosive changes were described as diffusely demarcated against the adjacent bone in three cases, all men, in the sacro-iliac joints, indicating an active inflammatory process. In the other affected sacro-iliac joints and in all affected peripheral joints moderately or well demarcated erosions were noted, indicating low inflammatory activity.

Subluxation was noted in 15 % (four cases) and ankylosis in 7 % (two cases) among the men, in association with advanced erosive changes. Subluxation was localized to MTP, MCP, PIP and DIP in the hands and feet. Ankylosis was observed in one case in the hands (wrists, PIP, DIP) and in one case in the sacro-iliac joints. No such changes were found among women.

Comparative study of sacro-iliac joints

A number of randomly selected roentgenograms of sacro-iliac joints (from 29 male and 27 female psoriatics from all age groups) were sent to Professor John S. Lawrence, Manchester, who evaluated them together with a corresponding number of roentgenograms of sacro-iliac joints from population studies in Leigh and Wensleydale, England.

Lawrence's gradation was lower than the author's (Table XIX). This held especially for gradation of doubtful as against minimal erosive changes. Because of the recording procedure, no and doubtful changes were combined in the author's evaluation. The difference was the same between Lawrence's and

the author's gradation among men and women. Among those persons whose roentgenological changes were graded differently, peripheral joint changes were equally often present as absent.

This clearly illustrates the difference in the results of different examiners. Lawrence has been one of the world authorities for some decades as regards the development of comparative criteria for evaluating rheumatological and roentgenological data for epidemiological purposes, in particular. It has been mentioned previously, however, that he reads roentgenograms "lower" than others (35), so that a difference was to be expected, though perhaps not so large.

The result of Lawrence's evaluation supported the result of the present investigation, however, in that there seemed to be no difference in the occurrence of sacro-iliac joint changes between the examined male and female psoriatics and in that the occurrence of such changes in female psoriatics was higher than has been shown previously.

In the comparative material which Lawrence himself selected and read against the roentgenograms of the psoriatics, there were no cases of definite erosion in sacro-iliac joints either in men or women (Table XX).

In order to shed further light on the sacro-iliac joint changes, especially in women, a comparison was made of sacro-iliac joints in 52 women of ages 25—29 and 35—39 years, who had undergone urography (Table XX). Only in one case were there definite erosive changes (bilateral), which corresponded to 4 % of the examinees. These women had undergone roentgenography mainly for recurrent infections of the urinary tract. No information on the presence of psoriasis amongst them was available.

These two investigations showed a marked difference between the psoriatics and the comparative materials, for both sexes, regarding the occurrence of erosive changes in the sacro-iliac joints.

Arthritis and degree of severity of psoriasis

Previous investigations. Clear relationships between severe forms of psoriasis and the occurrence of arthritis have been reported by several authors (13, 32, 154). Many authors have also pointed out a relationship between psoriatic nail lesions and arthritis, and especially the combination of nail changes and arthritis of the distal interphalangeal joints (11, 115, 124, 153, 154), while in other investigations this has not been confirmed (13).

Present investigation.

The variable. When evaluating the relationship between psoriasis and arthritis, the degree of severity of the psoriasis was expressed by the course variable described on pages 16 and 27. The type and intensity of the psoriatic lesions at the follow-up were also used in the evaluation. As regards arthritis, for peripheral joints the scoring suggested by Allander (2) was used, though slightly modified (Table V), and for the sacro-iliac joints the sum of the grade of erosion on the right and left sides.

Results and comments. The distribution of the degree of severity of the course of the psoriasis among the three groups with respect to joint symptoms is given in Table XXI. In the men there was a highly significant relationship between the occurrence of joint involvement and the more severe forms of psoriasis. Further, the course of the psoriasis was more severe among those with arthritis than among those with joint symptoms of a non-arthritic type (significant relationship). The women showed no significant relationship in this respect.

There was a statistically significant relationship between the degree of severity of the psoriasis and the severity of the erosive changes in peripheral joints (Table XXII).

Similarly, the severity of the course of the psoriasis was related to the severity of the erosions in the sacro-iliac joints, both among

TABLE XXI. Severity of psoriasis in relation to joint involvement in psoriasis. In percent.

Course of psoriasis	n =	Arthritis		Non-arthritic joint complaints		No apparent joint involvement	
		♂	♀	♂	♀	♂	♀
		31	33	51	59	45	81
Mild		17	73	30	87	57	76
Moderate		45	27	55	12	34	19
Severe		24	0	14	0	9	4
Very severe		14	0	2	2	0	1
		100	100	100	100	100	100

TABLE XXII. Relationship between psoriasis and erosive joint changes (men and women) after taking into account the age factor.

Psoriasis course	Erosive joint changes	Degree of significance of relationship
Severe course	<i>Peripheral joints</i>	
	more clinically involved joints	p < 0.001
	more roentgenologically (by erosion) involved joints	p < 0.001
	higher grade of erosion	p < 0.01
	<i>Sacro-iliac joints</i>	
	more roentgenologically (by erosion) involved joints	p < 0.01
	higher grade of erosion	p < 0.05

men (significant) and women (almost significant).

The degree of severity of erosive changes in both peripheral and sacro-iliac joints was related to both the extent and the intensity of the psoriatic lesions as observed at the follow-up (almost significant). Further, large plaques were more common than nummular lesions in the arthritis group. There were no sex differences in these respects.

In men there was a higher frequency of psoriatic lesions with a genital localization (glans and preputium) among those in the arthritis group, especially persons with sacro-

-iliac erosions, than among those with non-arthritic joint lesions or no apparent joint involvement (almost significant). Nail changes were more common in persons in the arthritis group than in those without apparent joint involvement. When all forms of psoriatic nail lesions were included (Table IX), this difference was almost significant. There was no difference in this respect, on the other hand, between persons in the arthritis group and those with non-arthritic joint involvement. There were no topographical relationships between nails with psoriatic lesions and erosive changes in adjacent DIP, either on fingers or toes.

Apart from the genital lesions and nail changes, no significant relationships were found between particular localizations of psoriatic lesions and the occurrence of joint changes.

A modification was made in the scoring of the severity of arthritis (Table V) which Allander used for rheumatoid arthritis (2), in that erosions in DIP were also accepted. This was motivated by the knowledge that involvement of DIP is common in psoriasis and thus cannot be excluded as in rheumatoid arthritis. In the examined psoriatics the changes in the interphalangeal joints were, however, so often uniformly distributed among DIP and MCP that the scoring of arthritis would have been the same even without this modification.

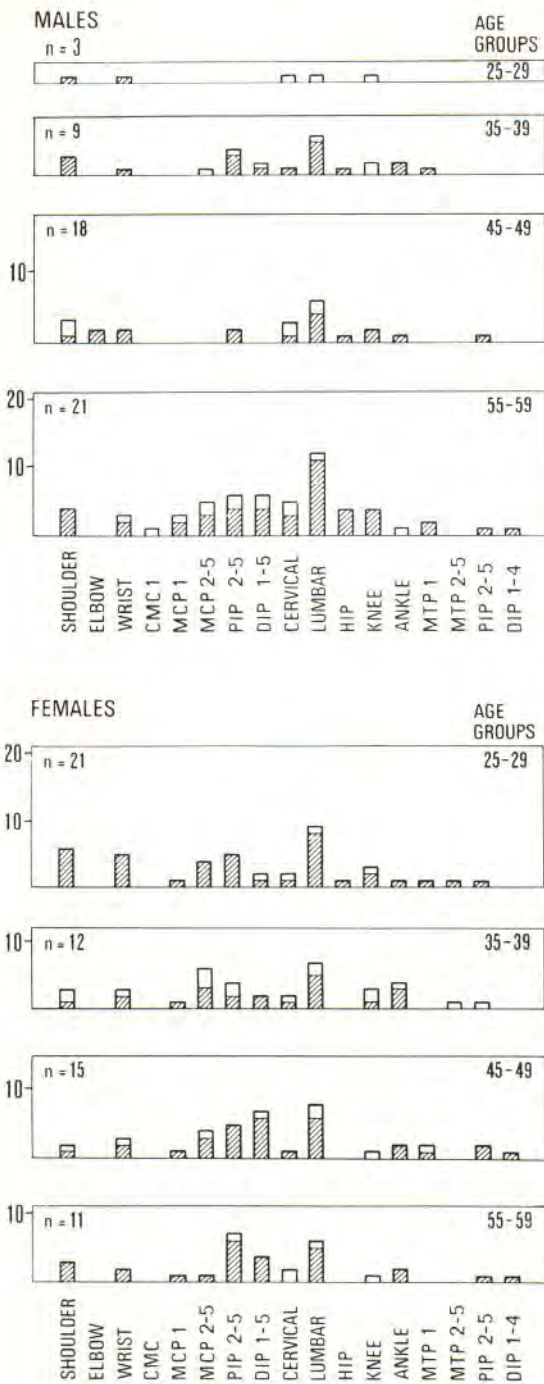


Fig. 9. Distribution of clinically involved joints among male and female psoriatics with non-arthritic joint involvement in the different age groups. The figure gives the number of persons with joints affected by swelling, tenderness, pain on movement, limitation of movement, subluxation or ankylosis (hatched) and by stiffness alone (white).

D. CLINICAL NON-ARTHRITIC JOINT INVOLVEMENT

By clinical non-arthritic involvement of the joints is meant here complaints and clinically observed symptoms which at the follow-up were considered not to satisfy the criteria laid down for peripheral arthritis or for pelvo-spondylitis.

Frequency of non-arthritic joint complaints

The distribution among the different age and sex groups of joint involvement that was evaluated as non-arthritis is given in Table XII. Altogether this group comprised 110 persons, 37 % of the total material of psoriatics. Fifty-one were men (40 % of the men in the total group) and 59 were women (34 % of the women); this difference is not significant. As some of the persons in this group were not examined roentgenologically, it is possible, as discussed previously (p. 47) that some cases with definite erosive joint changes may have been included.

The age distribution is also shown in Table XII. There was no significantly higher frequency of non-arthritic symptoms in higher ages.

Clinical findings at the joint examination

The variables. See p. 49.

Results. Swelling was observed in isolated finger joints among women and in the knee joint among men without any significant relationship to other findings of relevance for the arthritis diagnosis.

Tenderness and pain on movement occurred mainly in the lumbar spine (in 23 %) and in the hands (wrists, MCP, PIP) (in 19–12 %), mainly among women.

Stiffness was the most frequent finding. It occurred in the lumbar spine in 26 %, in finger PIP in 22 %, and in MCP in 16 %, and also in 10–12 % in the shoulders, wrists, fin-

TABLE XXIII. Comparison between certain symptoms among psoriatics with arthritis and with non-arthritic involvement. In percent.

Symptoms	Arthritis		Non-arthritic joint involvement		Significance of the differences		
	n =	♂ 31	♀ 33	♂ 51	♀ 59	♂	♀
<i>Anamnestic</i>							
morning stiffness		59	58	41	54	—	—
pain on movement		62	36	41	26	—	—
finger-hand joint involvement		72	55	39	68	p < 0.01	p < 0.05
lumbar spine involvement		45	45	45	42	—	—
cervical spine involvement		41	36	27	22	—	—
<i>Clinically</i>							
<i>Joints in fingers and hands</i>							
joint swelling		34	30	2	12	p < 0.001	p < 0.05
tenderness		38	48	12	47	p < 0.01	—
pain on movement		52	30	20	15	p < 0.01	—
stiffness		34	36	18	53	—	—
limited movement + subluxation + ankylosis		34	30	4	14	p < 0.001	p < 0.05
<i>Lumbar spine</i>							
stiffness		21	33	25	27	—	—
pain on movement		34	15	22	19	—	—
limited movement + ankylosis		34	24	24	20	—	—

ger DIP, neck and knees, estimated on the number of examined joints or joint groups. Stiffness in joints of the hands was significantly more common in women than in men.

Limitation of movement occurred to varying extents in the lumbar spine in 22 % and in finger DIP in 6 %, with no sex difference.

Fig. 9 presents the distribution of the non-arthritically involved joints in men and women of different age groups. The figure gives the number of persons in each group in whom clinical symptoms were noted for the different joints. It is seen that the most common localization of involvement was the lumbar spine, and also PIP and DIP of the fingers.

In Table XXIII a comparison is made between data for persons in the arthritis group and persons with non-arthritic joint involvement.

Amnestically only an almost significant difference was found concerning the reported involvement of joints in the hands, which was more common in the arthritis group.

As regards the clinical findings in peripheral joints, these were more common throughout in the arthritis group, with the exception of the feeling of stiffness on examination of the joint movements. No difference was found, on the other hand, concerning clinical findings in the lumbar region.

Comments. A relatively high frequency of joint symptoms and changes which were judged to be of the non-arthritic type was thus found. In contrast to the changes noted in the arthritis group, no increase in the frequency of involvement was found with increasing age, as might have been expected. In men a relationship was found between more severe forms of psoriasis (according to the course variable)

and a larger number of involved joints (almost significant), which was not observed in women.

Concerning the clinical findings, the comparison in Table XXIII shows good discrimination between persons with joint symptoms of the arthritic and non-arthritic type. On the other hand, with respect to spinal symptoms it was not possible at the clinical examination to distinguish those persons who had erosive changes in the sacro-iliac joints. This is in agreement with Jajic (64), who pointed out that in "psoriatic spondylitis" there is a striking discrepancy between clinical and roentgenological findings. This means that if one judges by clinical findings alone, many cases will be missed who at roentgenological examination would be found to have definite erosive changes.

E. OSTEOARTHROSIS AND PSORIASIS

Previous investigations. The predominant interest as regards joint affections in association with psoriasis has concerned the different forms of arthritis. Osteoarthrotic changes (OA) in psoriasis have, on the other hand, received less attention. It is probable, however, that many cases of OA have been included among the so called psoriatic arthropathies that have been studied without roentgenological examinations. This would seem to apply especially to changes in the distal finger joints, which are common in OA and which are often difficult to distinguish from arthritis in the early stages. It may therefore be assumed that many cases of early OA changes in DIP have gone under the name of seronegative distal arthritis.

Lassus *et al.* (77) showed in an investigation that OA occurred in an almost equal frequency in persons with psoriasis and joint

symptoms as in persons with rheumatoid arthritis, and that advanced OA changes were found only in psoriatics. They therefore concluded that OA could be of importance in so called psoriatic arthropathy. Their results are somewhat difficult to evaluate, however, in view of the selection of patients for the study.

Present investigation.

The variable. The OA changes were defined and graded in accordance with the recommendations presented at the last symposium on studies of rheumatic diseases in Rome in 1961 (71) and New York in 1966 (18) (p. 21).

In the analysis of the relationships between OA and psoriasis, variables for the severity of the course of the psoriasis were used, as well as the type of psoriatic lesions, the extent and intensity of the psoriasis at the follow-up and the duration of the psoriasis.

Results and comments. Definite OA changes were observed in 51 % of the X-rayed men and in 39 % of the X-rayed women. This difference was not significant. Fig. 10 presents the distribution of OA in different joints in men and women of different age groups. As in previous similar figures, the numbers of persons in each group in whom changes were noted in the respective joints are given.

It is evident from the figure that the OA changes increased with advancing age in both sexes (highly significant relationship).

No difference was found in the occurrence of OA changes among persons with and those without arthritis.

There were no significant relationships between the occurrence of OA and the studied variables expressing degree of severity or nature of the psoriasis.

Thus there was no evidence in this material of a close relationship between the occurrence or degree of severity of OA and the severity of the psoriasis.

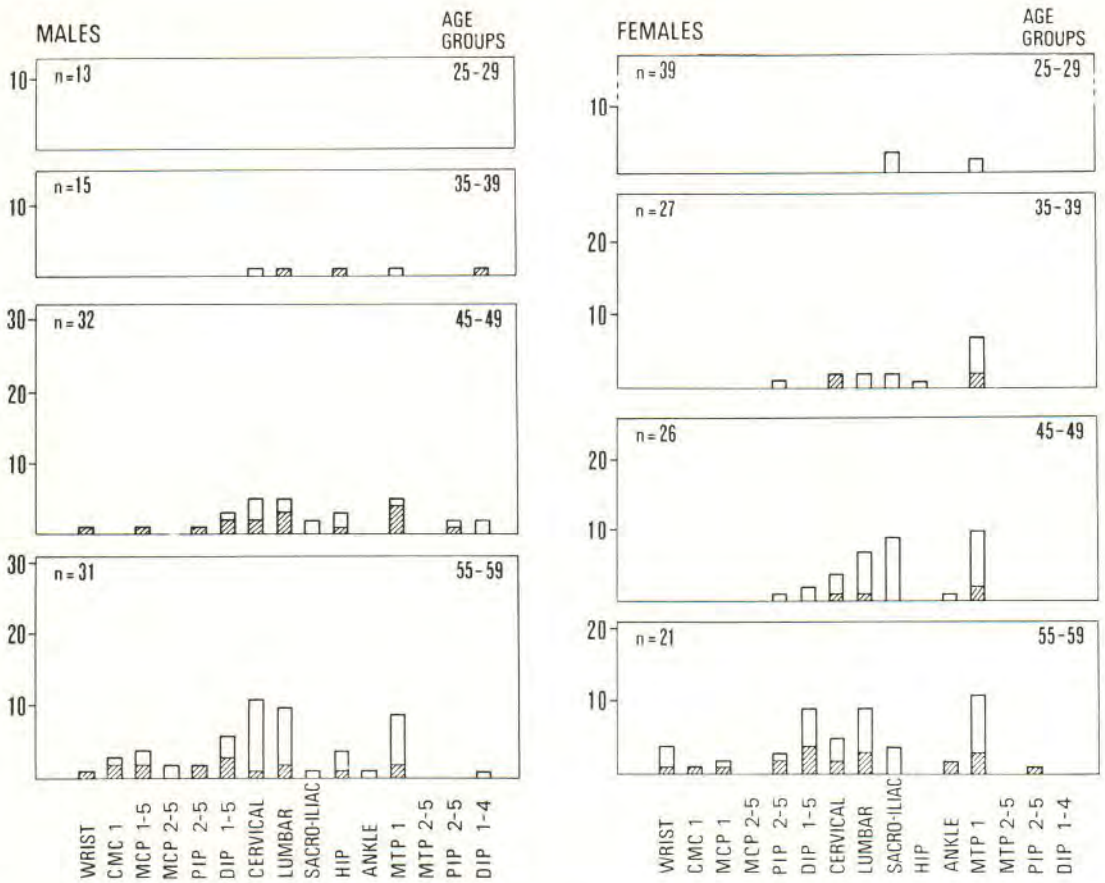


Fig. 10. Distribution of osteoarthrotic changes among male and female psoriatics with arthritis (hatched bars) and without (white bars) in the different age groups. The figure gives the number of persons with osteoarthrotic changes of grade 2 or more.

F. IS PSORIATIC ARTHRITIS A FORM OF RHEUMATOID ARTHRITIS?

Frequency

It is clearly evident from the previous discussion on nosological aspects of psoriatic arthritis that the prevalence figures based on clinical material, i.e. connected with health service establishments, differ from those obtained in population studies. The latter may be regarded as more representative. The discrepancies between population and clinical

materials are probably due to different selection factors.

Selection factors will be discussed in more detail in a later section. It is already evident, however, from the analysis of differences in the appearance and severity of psoriasis between men and women and between different age groups that selection factors had considerable influence in the present material. It is therefore not possible to draw any conclusions concerning the relationship between psoriatic arthritis and rheumatoid arthritis from

the frequency figures obtained in this investigation.

Clinical and roentgenological findings

Characteristic of the results of the clinical and roentgenological examinations of the peripheral joints was the strikingly frequent involvement of joints considered to be typically affected in rheumatoid arthritis (so called RA joints).

Thus, clinically the PIP joints of the hands were more often involved than the DIP joints, although qualitatively there was more frequent functional reduction of the DIP joints. Roentgenologically there were no significant differences between PIP and DIP of the hands, either qualitatively or quantitatively.

In Table XIV a comparison is presented between the clinical and roentgenological findings in the examined finger joints in the arthritis group and the corresponding findings in a large series of persons with rheumatoid arthritis (RA) recently studied by Allander (2); the latter were taken essentially from the same urban population from which the psoriatics were obtained. An important difference was that the persons with rheumatoid arthritis thus constituted an epidemiological population material and were not, for selection, connected with a hospital as in the case of the psoriatics. A comparison was nevertheless possible in that the psoriatics were not to be regarded as patients who had sought medical advice for joint complaints. The persons with rheumatoid arthritis were selected such as to fulfil epidemiological criteria for that disease, though some psoriatics were included among them.

The interesting finding in this comparison was the mutual relationship in the involvement of the three joint groups DIP, PIP and MCP. In the RA material the clinical findings were most common throughout in MCP, followed by PIP and DIP, in that order.

The RA material included a larger number of older persons than the PA group. Thus, when comparing the two, it must be taken into account that the frequency figures are based on materials with different age distributions.

As regards the erosive joint changes, in the RA material these were most frequent in MCP, followed by PIP, and were least frequent in DIP. This pattern was thus the same as in the clinical findings, but the differences were small. The erosions were, however, more severe in MCP and PIP than in DIP. In the PA group there was no difference between these three joint groups concerning the occurrence of erosions. Neither were there any differences in severity of the erosions between the three joint groups.

Thus certain differences are to be found in the pattern of peripheral involvement between the RA and PA materials. The most important would seem to be that in the PA group the DIP joints were relatively more frequently and more severely involved than in the RA material.

Even though in this investigation no isolated or advanced DIP changes were found of the kind that have been described as characteristic of PA (p. 38), the results obtained appear to indicate earlier involvement of the DIP joints in psoriasis than in rheumatoid arthritis. This would appear to support the view that PA is nosologically different from RA.

In the PA group there were two men and one woman with peripheral arthritic changes, mainly localized to PIP of the hands, MCP and the wrists, with no visible roentgenological changes but with a SCAT titre of 1/250 in the men and 1/64 in the woman. It was considered that these three persons probably had simultaneous psoriasis and RA.

No subcutaneous nodules were observed in any of the psoriatics of this investigation.

Serological findings

Apart from the three persons mentioned above, all persons in the PA group had low SCAT titres, according to the norms of the laboratory to be regarded as negative, regardless of whether the joint changes were localized to peripheral or sacro-iliac joints.

As shown previously, there were no differences in the distribution of SCAT titres between persons in the arthritis group, those with non-arthritic joint involvement and those with no apparent joint involvement.

When evaluating the serological findings in psoriasis and an absence of detectable RF, the changes in the immunoglobulin pattern that have been demonstrated in psoriasis should be kept in mind. Thus, a reduction of IgM has been found both in persons with "psoriatic arthropathy" and in persons with no joint involvement, in contrast to the conditions in RA, where IgM may be elevated (73, 96, 113, 114). In these psoriatics a simultaneous increase of IgG and IgA was found. How psoriatic arthropathy was defined and how joint involvement was excluded is not always clear from the studies cited above, however.

The immunoglobulin changes observed in psoriasis, and especially in psoriasis combined with joint involvement, imply that this may be a case of autoantibodies with antigammaglobulin activity, though not in the IgM class, for which conventional RF tests such as SCAT react, but in IgG. For these the current RF tests do not react (139). Psoriatic arthritis would thus resemble juvenile rheumatoid arthritis. Another possibility is that IgM, by the formation of a complex with IgG, may appear as a so called hidden rheumatoid factor. In this situation SCAT will not react either, and the result will be seronegativity according to conventional tests (22).

Summary

The clinical and roentgenological pictures of the peripheral joint involvement in psori-

atics with arthritis, with relatively marked involvement of the distal interphalangeal joints, absence of detectable rheumatoid factors and the clear relationship between severity of psoriasis and severity of joint involvement, constitute results in this investigation which may all be considered to support the view that nosologically the peripheral arthritis in psoriasis differs from rheumatoid arthritis as defined according to recommended criteria (18, 71).

G. IS PSORIATIC SACRO-ILIITIS A FORM OF PELVO-SPONDYLITIS?

Frequency

No prevalence figures for the occurrence of sacro-iliac joint changes of the arthritic type in psoriasis can be given on the basis of material connected with hospital services any more than for peripheral joint changes in psoriasis. Those authors who have studied sacro-iliac joint changes in persons with psoriasis and peripheral arthritis have reported frequencies for men of about 20 % (9, 32, 115, 152). This is a considerably higher frequency than is found for pelvo-spondylitis in population series, e.g. a figure of 6—9 % has been reported from England (51). In his population study from Holland, Cats (28) found a higher frequency of erosive changes in the sacro-iliac joints in persons with seronegative polyarthritis and psoriasis than in those without psoriasis, which indicates a relationship between sacro-iliac changes and psoriasis.

Detailed descriptions of the composition of different materials with respect to which joint symptoms are included are often lacking, which makes it difficult to compare them with the present psoriatic material, where a considerably higher frequency of sacro-iliac joint changes was found (Table XVII). It is

clear, however, that such changes occur in psoriasis considerably more frequently than has been previously reported.

The frequency of sacro-iliitis in the present material of psoriatics was 26 % for men. Whether this figure corresponds to the prevalence of sacro-iliitis among male psoriatics is impossible to decide from this investigation.

There was a remarkably high frequency of sacro-iliac joint changes among the women of the material. It was just as high as in the men, and as far as is known such equality has not been pointed out previously. It may have been due to the fact that the conditions in the women have not been examined closely, as pelvo-spondylitis is generally considered to be an essentially male syndrome, although it may probably occur more often among women than has been previously assumed (25).

As mentioned previously, there was a marked difference between the severity of the psoriasis between men and women in this material. If there were a close relationship between severity of psoriasis and occurrence of sacro-iliac joint changes, for which support was obtained in the male part of the material, this would mean that in reality there may be a higher frequency of sacro-iliitis among women with psoriasis than among men with psoriasis.

Clinical and roentgenological findings

Characteristic of the sacro-iliac joint changes were that they were accompanied by only mild back symptoms or none at all. This is in agreement with previous comments by Jajic (64).

The clinical symptoms were more often mild or completely absent among women than among men. It has been shown by Julkunen (69) and others, however, that women have milder symptoms than men in pelvo-spondylitis.

In only one case (a man) were sacro-iliac joint changes accompanied by changes in the cervical spine with a suggestion of "bamboo formation". Otherwise there were no roentgenological alterations in the cervical or lumbar spine either in the presence or absence of sacro-iliac joint changes. As mentioned previously, however, the cervical spine was only X-rayed in about one-third of the cases. All those who had clinical complaints from the cervical spine were included among persons who were X-rayed, however. Roentgenological changes in the cervical spine are considered to be associated with often pronounced clinical symptoms. It therefore seems improbable that at least more advanced changes would have been present among those who were not X-rayed.

Peripheral joint changes were common among psoriatics with erosive lesions in the sacro-iliac joints and, further, were more pronounced than among persons without such lesions.

Urogenital findings

The relationship has been pointed out, especially by Swedish authors, between infections in the urogenital system and pelvo-spondylitis in men (37, 97, 107, 118). The interest has been focused mainly here on the occurrence of prostato-vesiculitis.

Several authors have reported the occurrence of asymptomatic prostato-vesiculitis in 30—40 % of large male series, on the basis of both palpatory and cytological findings (37, 50, 107, 109, 118).

When establishing the presence of prostato-vesiculitis, apart from present symptoms of current infection there are three main factors of importance:

(i) information on the occurrence of gonorrhoeal or non-gonorrhoeal infection, possibly repeated, in the case history. Involvement of the male accessory sex glands has been shown

TABLE XXIV. Gradation of inflammatory changes on cytological examination of expressed prostatic secretion from male psoriatics with sacro-iliitis. Comparison between Professor Elisabeth Johannisson and the author.

Gradation according to Johannisson	Gradation according to the author				
	Normal	Doubtful	Moderate	Severe	Total
Normal	8	1	0	0	9
Doubtful	2	1	0	0	3
Moderate	0	0	2	0	2
Severe	0	0	2	2	4
Total	10	2	4	2	18

to take place in uncomplicated gonorrhoeal as well as non-gonorrhoeal urethritis (34, 42); (ii) palpatory findings on examination of the prostate and seminal vesicles; (iii) the cytological picture of prostatic secretion.

A history of gonorrhoea was found in a strikingly high frequency of the men in the present material of psoriatics, 21—25 % in the different age groups. Among the controls the frequency was 4—8 %. Other forms of urinary tract infections were stated to have occurred in 10—15 % of the psoriatics in the different age groups. In this case they did not differ from the controls (Chapter VII).

No higher frequency of gonorrhoeal or non-gonorrhoeal infections in the urogenital system was found among men with sacro-iliac joint changes and among men in the arthritis group as a whole, respectively, as compared with men with non-arthritic joint involvement and men with no apparent joint involvement. Neither was there any difference in the result of the palpatory examination of the prostate and seminal vesicles. At the follow-up only one man in the arthritis group was found with slight tenderness over the prostate, but this person showed no changes in the sacro-iliac joints.

Four men in the whole psoriasis material stated that they had been previously treated

for prostatovesiculitis. Three of them had joint symptoms, of whom two had both peripheral arthritis and sacro-iliitis. None of them exhibited signs of prostatovesiculitis at the time of the follow-up.

At a further examination 6 months to 1 year after the follow-up, those men (except one) who had definite sacro-iliac joint erosions were questioned again as to previous infections in the urogenital system and as to the occurrence of eye changes (iritis, conjunctivitis) and also underwent palpation of the prostate and seminal vesicles and expression of prostate secretion by massage. In only one man was there slight tenderness over one of the prostate lobes on massage.

Prostatic secretion was obtained from all except one of the examinees. The cytological findings were evaluated (after Papanicolaou staining) both by Professor Elisabeth Johannisson, Karolinska Sjukhuset, without knowledge of the clinical picture, and by the author, independently of one another. The results of the two evaluations are presented in Table XXIV. In 33 % (6 cases) of the 18 examinees the cytological picture was compatible with prostatovesiculitis.

No relationship was found either between pronounced clinical back symptoms or severe erosive changes in the sacro-iliac joints and pathological findings in the cytological picture of the prostatic secretion.

Thus no significant relationship was found in this psoriatic material between the presence of sacro-iliac joint erosions and pathological conditions in the male urogenital system.

As regards the female psoriatics, there was an equally high frequency of infections in the urogenital system among those who had sacro-iliac joint changes as among those with non-arthritic joint involvement or no apparent joint involvement. No gynaecological examination or urethroscopy (for disclosure of chronic urethritis) was performed. About 6 months to 1 year after the follow-up, those women who had sacro-iliac joint erosions underwent examination of the urine bacteriologically and for the presence of protein and examination of the urine sediment. In two (out of 24) cases a growth and sparse growth, respectively, of *E. coli* were found on culture.

Thus no evidence was found in the women, either, of a relationship between the presence of sacro-iliac joint erosions and of infections in the urogenital system.

A relationship between pelvo-spondylitis and pregnancy has been discussed (56, 111). However, of the psoriatic women, the frequency of those with children of their own was the same among those with sacro-iliac joint erosions as among those with no such changes, when consideration had been taken of age.

Intestinal findings

A high frequency of seronegative polyarthritis and sacro-iliitis has been reported in ulcerative colitis (93) and regional ileitis (7), in particular. Further, in both these conditions a clearly higher frequency of sacro-iliitis has been found among men than among women, which is in agreement with the general opinion on the distribution of pelvo-spondylitis between the sexes. It has been considered that pelvo-spondylitis occurs to a higher extent in these conditions than can be explained by chance alone.

The present investigation did not include a close analysis for the occurrence of ulcerative colitis or regional ileitis, which would have required roentgenological examination of the intestinal tract. As reported in more detail in Chapter VII, a study was made, however, of the occurrence of different disease manifestations, and this included questions concerning gastrointestinal symptoms. Although these questions had a relatively low degree of certainty, it was possible by comparisons in two control materials, who answered the same questions under similar conditions, to trace a higher frequency of intestinal symptoms among the psoriatics. No difference was found concerning these symptoms, however, between the psoriatics who had erosive changes in the sacro-iliac joints and those who had non-arthritic joint involvement or no apparent joint involvement.

Thus no anamnestic evidence was obtained for a relationship between the occurrence of sacro-iliac joint changes and intestinal diseases in the psoriatic material.

Summary

A relationship is considered to exist between pelvo-spondylitis, on the one hand, and urogenital infections, especially prostatovesiculitis and intestinal diseases such as ulcerative colitis and regional ileitis, on the other. These latter diseases have been believed to be of pathogenetic importance for the development of pelvo-spondylitis.

In the present investigation a relationship was found between psoriasis and sacro-iliitis, not only among men, which has been reported previously by other authors, but also among women to at least an equal extent. This means a considerable difference as compared with the situation in pelvo-spondylitis, which is regarded as an essentially male syndrome.

Approximately half of the psoriatics with sacro-iliitis also had peripheral joint involvement. Inversely, most of the psoriatics with

peripheral arthritis also had sacro-iliitis simultaneously.

To a large extent, psoriatics with sacro-iliitis had uncharacteristic or no clinical low back symptoms. This also means an important difference as compared with the situation in pelvo-spondylitis, where pain and stiffness are often predominant.

Basing the evaluation on the recommended criteria for the pelvo-spondylitis syndrome (18, 71), marked discrepancies between this disease and the changes observed in the psoriatics were thus evident. These discrepancies

were considered to support the view that sacro-iliitis in psoriasis differs nosologically from pelvo-spondylitis.

The question of whether these changes are typical for psoriasis cannot be answered without comparisons with pure population studies. The prevalence of sacro-iliitis and of spondylitis in women with and without psoriasis should be specially investigated.

It would seem justifiable to claim, however, that in psoriasis there is a high frequency of arthritic changes not only in peripheral but also in sacro-iliac joints.

VI. SOCIO-MEDICAL CONDITONS IN PSORIASIS

Among all the factors that are influenced by and also influence the social situation of the individual, the state of health, or rather its deficiencies, may be said to be one of the most important. During recent years, and especially in the last decade, increasing attention has been paid to this problem in Sweden, in different fields of medicine. No studies concerning the social conditions associated with psoriasis or other skin diseases have been made in this country, however, with the exception of Hellgren's investigation which included the prevalence of psoriasis in different occupational groups (58). As regards the other Scandinavian countries, certain social aspects were elucidated in Lomholt's study of psoriasis in the Faroe Islands (90), and from Denmark a report has been made of the home conditions of persons admitted to hospital for skin and venereal diseases (89).

The relationship between the psoriasis and the patient's socio-medical situation is of interest from two aspects. One of them is the importance of the occurrence and degree of severity of the disease, especially at a young age, for the adjustment of the affected person to society. The other aspect concerns the importance of the social situation for the development of the disease. The causal relationships between a disease and the social conditions are usually very difficult to determine, and as a rule studies of such problems have to be limited to demonstration of possible connections.

There are several reasons for assuming the existence of a relationship between psoriasis and the social situation. Psoriasis is a chronic

disease, it often has its onset at an early age, it is often localized to exposed parts of the body, and it may be accompanied by joint involvement.

In the present study of relationships with social factors, the following variables were used throughout as expressions of the psoriasis: age at onset, duration, severity of the course of the disease, subjective complaints from the psoriasis, the presence of joint symptoms in general and the number of clinically and roentgenologically (by erosions) involved joints.

A. FAMILY AND HOUSING SITUATIONS

Civil state

Previous investigations. In connection with prevalence studies of psoriasis, among other diseases, in certain parts of Sweden, Hellgren (58) found no difference in civil state between psoriatics and matched controls without psoriasis. How these controls were selected is not clear, however.

In his study from the Faroe Islands, Lomholt (90) found that psoriasis did not prevent women from marrying at the same age as women without psoriasis. He did not investigate the situation for men in this respect.

Present investigation.

The variables. In this study the civil state was divided into unmarried, married (inclu-

ding so called common-law marriage), widow/widower and divorced. The number of children (of their own) was also studied.

A comparison with the ILI controls (p. 11) was made.

Results and comments. The distribution of different civil states among age and sex groups is shown in Table XXV. In comparison with the ILI controls, a tendency was noted throughout the groups for a lower proportion of the psoriatics to be married and a higher proportion to be unmarried or divorced. The differences were not statistically significant, however.

The age at onset of the psoriasis was of great importance for the evaluation of the civil state. When the civil state was compared between those with an onset before and those with an onset after the age of 20 years, it was found that in the two oldest age groups (55—59 and 45—49 years) there were significantly fewer married persons — both men and women — among those with an early onset than among those with a late onset, while the reverse was noted for the age group 35—39 years. The youngest age group (25—29 years) was not included in this part of the analysis. Seen as a whole, men with an onset of psoriasis before the age of 20 years were almost significantly more seldom married than men with an onset after that age. In women the above-mentioned differences between the age groups were eliminated when the women were considered as a whole.

An early onset of psoriasis was apparently of more importance for the older than for the younger individuals as regards marriage. On direct questioning, however, only 7 % of the men and 6 % of the women with an early onset of psoriasis stated that they had experienced the disease as a hindrance to planned marriage, but here there was no age difference in the replies. Of those who gave this answer, half married later.

Concerning divorce, there was no difference between the age groups with respect to the

relationship between an early and late onset. Among divorced psoriatics, 18 % of the men and 7 % of the women stated that psoriasis had been a contributory reason for the divorce. There were no age differences here. The value of such information is of course relatively small when given in retrospect and as a reply to a direct question, as the degree of rationalization is not known.

There was no significant relationship between the severity of the psoriasis and the frequency of marriage or divorce. On the other hand, among the women there was a clear relationship between subjective complaints from the psoriasis and divorce (significant).

Neither the occurrence of joint symptoms in general nor the extent of the joint involvement were related certainly to the civil state.

As regards number of children, there was no difference between the psoriatics and the ILI controls of the same civil state and age.

Thus in this material of psoriatics there was a (non-significantly) lower frequency of married persons and a higher frequency of unmarried and divorced persons than in the control material. It was also found that among the older psoriatics an early onset of the disease was associated with a low marriage frequency.

Housing situation

Previous investigations. As far as is known, no studies of the housing situation of persons with psoriasis have been made previously. In consideration of the exfoliative nature of this disease, it is often of great importance that the housing standard is satisfactory. Furthermore, many psoriatics, by reason of their daily local therapy, need access to good possibilities for bathing and laundering.

Present investigation.

The variables. The presence of central heating, bath or shower and access to a washing

machine were used as expressions of the housing standard.

The term overcrowding was defined in two ways in accordance with Swedish official statistics (129). A household was considered to be overcrowded, according to alternative 1, if there were more than two persons per room, not including the kitchen, and according to alternative 2 if there were more than two persons per room, the kitchen and one room not included.

Comparisons were made with the ILI controls.

Results and comments. The housing standard among the psoriatics was good throughout. 94 % of the men and 98 % of the women lived in their own flat or house.

The men had a lower housing standard than the women (almost significant difference), however, when consideration was taken of the presence of central heating and a bath or shower. Access to a washing machine was found significantly more frequently among the women than among the men.

The psoriatics who had a lower housing standard (no central heating, no flat or house of their own, lodging with others) were all single (unmarried, widowers, divorced). The men were from all age groups but mainly from the oldest group, while the women were mainly from the youngest age group.

Of the single men in the two oldest age groups, 38 % did not have central heating, compared with 5 % of the single women in the same age groups (significant difference). Among the single persons in the two youngest age groups the corresponding figure for the men was 28 % and for the women 18 % (non-significant difference).

The housing standard of the male ILI controls was higher (almost significantly) than that of the male psoriatics, while that of the female ILI controls was the same as that of the female psoriatics, when age was taken into account.

Among the psoriatics, overcrowding according to alternative 1 was found in 2 % of the men and 1 % of the women, and according to alternative 2 in 20 % of the men and 28 % of the women. These sex differences were not significant.

The corresponding figures for households in Greater Stockholm (for 1965, i.e. the latest available population and housing census) were 6 % according to alternative 1 and 34 % according to alternative 2 (129). It must be taken into account that the Stockholm figures are derived from a population and refer to households and not individuals, and therefore the figures are not directly comparable, but they nevertheless give some idea of the situation. When the psoriatics who were lodging with others and those who did not own their flat or house were excluded, however, there was still a lower degree of overcrowding among the psoriatics than the average for the region.

There was no relationship between lower housing standard or higher degree of overcrowding among the psoriatics and a more severe course of the disease or more subjective complaints from the disease. Neither were joint symptoms more common among those with a low than with a high housing standard.

This may perhaps be regarded as a result of the assistance given by the local housing authorities. Of the psoriatics, 13 % of the men and 5 % of the women stated that they had obtained better homes in this way with the support of a medical certificate stating their need for improved housing because of their psoriasis. Such assistance is intended for more severe forms of diseases, and among the men the course of the disease was in fact significantly more severe in those who had been helped towards better housing in this way than in others.

Place of residence

The variables. In accordance with the selection criteria, the investigated psoriatics were

TABLE XXV. Civil state, school education, vocational training, degree of gainful employment and social class among psoriatics (P) in comparison with ILLI controls and matched controls (C) in the different sex and age groups. The figures are given in percent. For the number of persons in the different age and sex groups, see Tables I and II. The internal non-participation, i.e. information is lacking, is not indicated in the table.

Variables	MEN						WOMEN														
	25-29		35-39		45-49		55-59		Total		25-29		35-39		45-49		55-59		Total		
	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	
<i>Civil state</i>																					
never married	36	28	26	7	11	3	8	12	17	12	18	21	14	4	15	10	18	3	12	10	
married	52	72	65	86	84	86	67	76	70	80	73	76	66	82	69	78	61	63	69	75	
widow/widower	0	0	0	3	0	3	0	0	0	1	0	0	0	0	0	4	14	20	2	6	
divorced	8	0	9	3	4	9	21	12	11	7	9	3	21	14	15	8	7	13	13	9	
<i>School education</i>																					
elementary level	52	69	61	52	58	71	65	59	60	63	55	36	50	57	56	74	57	77	57	62	
middle level	36	13	30	34	24	11	27	19	28	19	31	42	30	39	33	18	36	20	32	28	
higher level	8	19	9	14	13	17	2	21	8	18	8	21	16	4	10	8	4	3	8	16	
<i>Vocational training</i>																					
< 2 yrs	12		30		9		10		14		29		32		31		21		29		
> 2 yrs / > 1 yrs	28	34 ^a	39	66 ^a	58	31 ^a	50	31 ^a	47	39 ^a	27	48 ^a	29	36 ^a	15	24 ^a	39	27 ^a	27	33 ^a	
<i>Gainful employment</i>																					
part-time work	4	16	0	7	7	0	8	10	6	8	22	39	39	46	28	34	32	33	29	38	
full-time work	72	72	91	93	73	86	69	74	75	81	44	18	37	25	59	42	43	37	45	32	
/ full-time + part-time	84 ^b		100 ^b		98 ^b		94 ^b		94 ^b		63 ^b		55 ^b		59 ^b		46 ^b		58 ^b		
<i>Social class</i>																					
I	10	16	0	21	17	26	2	29	8	23	5	21	23	22	5	12	7	20	9	17	
II	0 ^b		9 ^b		17 ^b		14 ^b		12 ^b		80	55	64	39	67	54	57	37	70	48	
III	40	31	45	41	46	40	36	29	42	35	15	24	13	39	28	34	32	43	20	35	
	60 ^b		55 ^b		54 ^b		41 ^b		50 ^b		40 ^b		36 ^b		45 ^b		38 ^b				
	50	53	55	38	37	34	61	42	50	42											
	40 ^b		36 ^b		29 ^b		29 ^b		38 ^b												

^a for ILLI controls vocational training of more than one year was recorded

^b indicates matched controls

resident (registered) in the City or County of Stockholm at the time of hospitalization. The places of residence of the persons in question were grouped into four zones: 1) the inner city, which corresponded to the area reported under the same designation in the official statistics, e.g. the Year- Book of Statistics for Stockholm (129), 2) the outer city, which partly comprised the area reported in the same statistics under this designation, but in addition the areas reported in these statistics as separate from the City of Stockholm itself but which for purposes of health services were considered equivalent in this investigation (e.g. Solna, Sundbyberg, Lidingö, Nacka, Danderyd, Djursholm, Täby, Järfälla); 3) the suburban zone, comprising the other areas included under the name Greater Stockholm, and 4) the rest of the County of Stockholm.

Thus the inner zone had a radius of about 2—3 km, the next zone a radius of about 10—15 km, and the third (the suburban zone) a radius of about 20—30 km, counted from the city centre.

Results and comments. Related to population figures for the different zones for the year 1960 (as a mean value of the time period to which the selection applied) in the respective age groups, the proportion of the population constituted by the studied psoriatics was calculated. Placing the relative proportion of studied psoriatics resident in the inner city at 1, the mutual relationships between the zones were as follows: for the outer city also 1, for the suburban zone 0.81 and for the rest of the county 0.38. This applied to all psoriatics in the material, including those who did not participate in the follow-up. There was no sex difference in this respect.

The place of residence showed no relationship to civil state. Neither was it related to the severity of the psoriasis or to the subjective complaints from the disease.

There was thus no difference as regards place of residence between the inner city and outer

city, while there was a somewhat (non-significantly) smaller proportion of psoriatics resident in the suburban zone and a significantly smaller proportion in the rest of the county.

There are no prevalence figures available for psoriasis in the four zones, but Hellgren found in his studies of psoriasis in certain areas of Sweden that there was no significant difference in prevalence between densely populated areas (such as the County of Skaraborg) and more sparsely populated areas (such as the County of Jämtland) (58). No study of typical city areas was included in his investigation, however, but there is no reason to assume that there are such large differences in the prevalence of psoriasis between the inner and outer zones as would correspond to the differences in the relative distribution of the psoriatics of the present study. The latter differences would thus seem to have other causes, e.g. differences in the utilization of health care resources due to such factors as longer distances and different attitudes to the health services in more rural areas than in the more central areas of the city.

Emigration

Previous investigations. The importance of skin diseases, and especially psoriasis, for emigration especially to warmer countries does not appear to have been studied previously.

Psoriasis has been reported to be more common in cooler and more temperate climates, however, than in warmer climates, and reports have also been made on improvements of the disease in warmer climates (14, 33, 63); this has been utilized therapeutically in recent years (101). Church (33) also expressed the idea that psoriatics should possibly be recommended to move to a warmer country.

For the sake of completeness it must be mentioned here that differences in the prevalence of psoriasis in different parts of the world have been considered to be associated more with racial differences and genetic factors than to differences in climate (14, 91).

Present investigation.

Results and comments. Of the 445 persons in the whole material, 10 had emigrated at the time of the follow-up, all during the last 5-year period. Three of these were men and 7 women. Two of the men and all of the women, all of whom had emigrated to southern European countries, belonged to the youngest age group (25—29 years), which corresponded to 7 % and 6 % of the men and women, respectively, of this age.

The emigration of psoriatics in the youngest age group was twice as large during this 5-year period than could have been expected from the emigration at a corresponding age to other European countries (outside Scandinavia) from Greater Stockholm in 1967 (as a mean value of the 5-year period) (129).

One of the men and 5 of the women (or their relatives) stated that the psoriasis had been a contributory reason for their emigration to a country with a more sunny climate than Sweden, although available information indicated that all of them had had a relatively mild form of the disease.

Although information of this kind, obtained retrospectively and especially in reply to a special question, is of limited value, it suggests that psoriasis even in a mild form can be an important contributory factor in the decision to break away from one's own country to live in a warmer climate.

B. EDUCATIONAL AND EMPLOYMENT SITUATIONS

School education

Previous investigations. To the author's knowledge, no previous study has been made of the possible effect of an early onset of psoriasis on the education of the afflicted person.

Present investigation.

The variables. School education was divided into three levels: the first (lowest) comprised elementary school, the second (middle) lower secondary school, girls' lower secondary school, folk high-school, and vocational schools, and the third (highest) different kinds of *gymnasia*, postgymnasial schools and university studies.

Comparisons with ILI controls were made.

Results and comments. The levels of school education for the respective age and sex groups are presented in Table XXV. Younger persons had a higher level of education than older persons, especially among the men, but this difference was not statistically significant. This was in agreement with the general tendency in Sweden, but the differences between older and younger persons were smaller than might have been expected in consideration of the successive educational developments. Older men with psoriasis had a somewhat lower educational level than women of corresponding ages.

There was no significant relationship between education and civil state in the psoriatic group.

Compared with the ILI controls, the psoriatics of both sexes had a somewhat lower school education (though not significantly).

The relatively high level of school education of both psoriatics and controls was considered to be due to the fact that the inhabitants of a big city area have, on the average, a higher education than a rural population. This assumption is supported by a comparison with the situation for the population of Sweden as a whole, where 74 % had undergone the first level, 20 % the second and 6 % the third (135).

An early onset of psoriasis (before the ages of 10 and 20 years, respectively) showed no significant relationship to the level of education in this investigation.

Thus the presence of psoriasis at an early age did not appear *per se* to have influenced

the education. The extent to which the disease nevertheless affected the choice of type of education will be discussed later.

The level of school education showed no significant relationship to severity of the course of the psoriasis, either in the case of an early or late onset of the disease. Neither was there any significant relationship between education and the occurrence of joint symptoms or the extent of joint involvement.

The Swedish Inquiry into Low Incomes showed a clear relationship between higher morbidity and lower education (135), a finding which has also been made for persons with rheumatic diseases in the Stockholm region, in a population study (2). No such relationship was found for psoriasis, however, in the present investigation.

Vocational training

Present investigation.

The variables. The psoriatics in question were grouped according to whether they had undergone vocational training, after their ordinary school education, for a maximum of two years, for more than two years, or not at all.

Comparison could be made to some extent with the ILI controls, for whom, however, only vocational training for more than one year had been recorded.

Results and comments. For the psoriatics, a longer vocational training was closely related to a higher school education, both among the men (significant) and among the women (almost significant). Vocational training was more common throughout in men than in women. A longer vocational training was more common among older than among younger persons (Table XXV).

There was no significant relationship between vocational training and civil state.

Because of differences in the possible variables, the comparison with the ILI controls was not complete. It was found, however,

that male psoriatics had had at least two years' vocational training more frequently (but not significantly so) than the controls had had at least one year. Both male and female psoriatics had undergone some form of vocational training, regardless of its duration, more frequently than the controls had undergone vocational training for one year or more (significant). This latter difference was most marked among the two oldest age groups.

The length of the vocational training was related to the age at onset of the psoriasis (almost significant). Those who were younger than 20 years at the onset of the disease had no or a shorter period of vocational training more often than those who were older than 20 years at the onset. This applied to both sexes when the age at follow-up was taken into account. (When this was not done, this relationship was statistically highly significant, which again showed the importance of taking the composition of the material into consideration (p. 25).

Among the men it was also found that there was a lower frequency of vocational training in persons with psoriasis in the family (parents, siblings) than among those with no familial occurrence. This finding was not made for the women. The relationship of low vocational training to familial occurrence of psoriasis was not unequivocal, however. Those who had reported psoriasis in the family had also reported an earlier onset of their disease than those without psoriasis in the family. Which was of the greatest importance for the vocational training — the early onset or the familial occurrence — could not be decided from this investigation.

There was no relationship between lack of or shorter vocational training and either a more severe course of the psoriasis or more subjective complaints from the disease.

Neither was any relationship found between vocational trainings and the occurrence of joint symptoms and extent of the joint involvement.

Thus just as little relationship was found between inferior vocational training and greater severity of psoriasis as with regard to school education.

Gainful employment

Previous investigations. The relationship of psoriasis to gainful employment as such has not been studied in detail previously. Lomholt (90) found, however, in his study in the Faroe Islands that the distribution of different occupations among the psoriatics was essentially the same as for the Danish population. In his very detailed investigation of the prevalence of psoriasis among representatives of different occupations in certain parts of Sweden, Hellgren (58) found a high prevalence of the disease in certain types of occupations. He was unable to find any common denominator for these occupations, however, that might explain a relationship.

Present investigation.

The variables. The degree of gainful employment was expressed as full-time and part-time work. The criterion for full-time work was at least 35 working hours per week (135). Shorter working hours were counted as part-time work.

A comparison was made with the ILI controls, for whom information on working hours was registered, and also with the matched controls, for whom, however, because of the form of registration, no division into full- and part-time work could be made.

No detailed analysis of the distribution of occupations among the psoriatics was made, apart from that included in the study of social grouping.

Results and comments. Of the psoriatic men, 81 % were gainfully employed. Most of them, 75 %, had full-time work. Of the women, 74 % were gainfully employed, but only 45 % had full-time work. There were no significant differences between the age groups as

regards the distribution of full- and part-time work (Table XXV).

Among the women, full-time work was more common in single persons, and part-time more common among the married (significant). Married men were gainfully employed to a somewhat higher extent (but not significantly) than single men.

Compared with the ILI controls, the frequency of gainful employment was somewhat (but not significantly) lower among male psoriatics. The female psoriatics showed a higher frequency of full-time employment than the female controls (almost significant); this was noted especially for the younger age groups.

In comparison with the matched controls, psoriatic men were gainfully employed (full- or part-time) to a clearly lower extent (highly significant); this was most pronounced among the older persons. Psoriatic women were gainfully employed to a clearly higher extent than the matched controls (highly significant), especially the older persons.

The number of housewives without gainful employment was the same among the psoriatics and the matched controls in the youngest age group (33-34 %), but then decreased among the psoriatics with increasing age to 14-15 % in the two oldest age groups, as compared with 36 % among the oldest controls.

An early onset of psoriasis showed no significant relationship to gainful employment. A more severe course of psoriasis was more common among those receiving a disablement pension and therefore not gainfully employed. Among the gainfully employed, on the other hand, there was no difference in the course of the disease between those with full-time and part-time work.

Gainfully employed female psoriatics, however, and especially those with full-time work, reported fewer subjective complaints from their skin disease than women not gainfully employed (significant difference).

Among the men, the occurrence of joint symptoms and of more extensive joint involvement were significantly related to a lower frequency of gainful employment; this was most marked among the older men. A combination of more extensive joint involvement and a more severe course of psoriasis was especially associated with a lower frequency of gainful employment (significant relationship).

Importance of psoriasis for choice of education and vocation

In the study of education and gainful employment among the psoriatics, the question naturally arose to what extent the skin disease had been of decisive importance for the choice of education and vocation.

Among psoriatics in whom the onset of the disease had occurred before the age of 20 years, 11 % of the men and 16 % of the women stated that the disease had influenced their choice of education — here no difference is made between school education and vocational training —, while 19 % of the men and 14 % of the women stated that it had influenced their choice of vocation. Among psoriatics with an onset after the age of 20 years, 12 % of the men and 6 % of the women stated that the disease had influenced their choice of vocation.

Seventeen percent of the men and 10 % of the women stated that the disease had been of importance for the choice of their present work. Whether the disease had had its onset before or after the age of 20 years played no role here.

Altogether about 30 % of the male and 20 % of the female psoriatics stated that their psoriasis had been of importance for their choice of education, vocation and/or present occupation. This was somewhat (but not significantly) more common among the older than among the younger psoriatics.

There was no statistically significant relationship between the information that psoriasis had influenced these choices and the severity of the course of the disease, but the former was related to the subjective complaints from the disease (significant). This was considered to support the value of subjective complaints as a variable.

A chronic skin disease may undoubtedly have great influence on the possibilities of managing one's work. However, it was only 11 % of the men and 8 % of the women who considered that the psoriasis had had a detrimental effect on their work. Reversely, 19 % of the men and 14 % of the women stated that their work had a negative effect on the disease. Sixty-one percent of the men and 74 % of the women did not consider that the disease had had any noteworthy effect on their work, or vice versa.

A change of occupation, mainly because of the psoriasis, was reported by 16 % of the men and 9 % of the women.

There was no significant relationship between severity of the course of the psoriasis and information on a negative effect of the psoriasis on the work or the reverse. Neither was the former related to change of occupation mainly because of psoriasis. On the other hand, localization of the psoriatic lesions to the hands, especially the nails, was more frequent (but not significantly) in these persons.

An analysis of the occupations of the studied psoriatics showed that there was no appreciable difference in occupational distribution between those who stated that the skin disease had been of importance for their choice of education and vocation and those who denied this. This may mean that the experience that the disease had influenced these choices had no true signification. It is also possible that certain occupations may have had greater attraction than others for persons with a skin disease such as psoriasis, e.g. occupations involving less direct contact with other people. This investigation could not give an answer

to that question, which would have required more extensive interviewing. The results indicate a need for further studies of this problem. These should include the question of what occupations are directly unsuitable for a psoriatic and what occupations can be recommended especially for younger persons with the disease so that they may avoid unnecessary problems in the future.

Social classes

Present investigation.

The variables. Division into social classes in Sweden was first used in connection with election statistics at the elections to the Second Chamber (the Lower House of Parliament) in 1911. No major changes in the classification have taken place since that time.

The primary dimension in the classification is the occupation of the person in question. Inherent in this concept are co-varying factors such as education and income. Social class I comprises mainly owners of large business enterprises and higher officials in the government sector, social class II lower officials and owners of small-scale enterprises, and social class III general workers (see Appendix III).

A married woman not gainfully employed (housewife) is classed according to her husband's occupation. If she is gainfully employed, she is classed according to her own occupation regardless of her husband's social class.

The whole division into social classes has been subjected to strong criticism on the grounds that many new occupational groups are excluded and that it may preserve older evaluations that have no place in a modern community (67). It is therefore now excluded from official Swedish statistics, but is used for many purposes where a variable for position in the structure of society is needed; its latest major use was in the Swedish Inquiry into Low Incomes (135).

In the present investigation the classification modified as in the Inquiry into Low Incomes (67, 135) was used.

Comparisons were made with ILI controls and with male matched controls. Information on the female matched controls in the registers of the Regional Social Insurance Offices was incomplete in this respect.

Results and comments. The distribution of social classes among the age and sex groups is given in Table XXV. Among the men, younger persons showed a slight tendency (not significant) towards a higher social class. This tendency was rather more pronounced in women (almost significant).

On comparison with the ILI controls, marked differences were found. The psoriatic men belonged to a lower social class than the controls (significant), while the psoriatic women belonged to a higher class (highly significant). This should be regarded in the light of the higher frequency of gainfully employed among the female psoriatics than among the controls, which thus meant that the social classification was based on the woman's own occupation, and not her husband's, to a higher extent among the psoriatics than among the controls.

Among the ILI controls a tendency (not significant) to a higher social class with increasing age was found for both sexes, which was the opposite of the tendency observed in the psoriatics.

Smaller differences were found on comparison with the matched controls, but here again the psoriatics (male) belonged to a lower social class than the controls (almost significant difference).

The differences between the ILI controls and the matched controls were also pronounced (significant) as regards social class, however; in particular there was a higher frequency of persons in social class I among the ILI controls. This was remarkable in consideration that the ILI controls were to comprise a representative selection of the population of the Stockholm region. It is true that among both the psoriatics and the matched controls there was a smaller number of persons from

the County of Stockholm outside Greater Stockholm, but the social classification of these persons did not affect the relationships mentioned above. Otherwise it would be reasonable to assume that there would be a higher frequency of higher social classes in the population of a big city than in a rural population, which assumption was supported by the fact that all three groups (the psoriatics and the controls) had higher social grouping than the average for the whole country (135). In considering the comparison with the ILI controls it must also be taken into account that persons with skin diseases (both psoriasis and other skin diseases) were first excluded. These (total 6 %) could not have influenced the relationships appreciably, however, even if all had belonged to one social class.

There was no significant relationship between the variables employed for expressing the psoriasis, such as age at onset, duration, severity of the course of or subjective complaints from the disease, and social class, either for men or women. There was an almost significant relationship, however, between lower social class and more extensive joint involvement in the men.

The analysis of the social class variable thus revealed signs of marked differences between the psoriatics and the controls. These differences could not, however, be related with certainty to the severity of the disease. It is conceivable, of course, that the mere presence of psoriasis, even in a mild form, may have a detrimental effect on the adaptation of the afflicted person in society. It was remarkable, however, that the women differed so distinctly from the men and showed clearly higher social grouping than their controls.

C. FINANCIAL SITUATION

Income

Previous investigations. The financial situation in relation to psoriasis or other skin diseases does not seem to have been studied previously. This factor is intimately connected with the possibilities for gainful employment.

Present investigation.

The variable. As an expression of income, sickness benefit was chosen. According to the regulations on general health insurance in Sweden, every Swedish citizen over 16 years is entitled to sickness benefit in the event of complete incapacity to work. About 20 % of the population are excepted from this rule, however. These mainly consist of students aged 16—19 years, persons over 67 years of age and persons receiving a disability pension (3, 135).

Placement in a sickness benefit class depends upon the income from gainful work which the insured person assumes he will receive until further notice, either as an employee in public or private service or from other gainful employment. The calculation of income from gainful work is based primarily on information given by the insured person himself or his employer (3).

The sickness benefit could thus be employed as a measure of income from gainful employment. However, owing to the formulation of the rules for placement in a sickness benefit class and deficiencies in reporting of changes in income, errors may arise in this procedure. These may appear in the form of under-insurance, i.e. when the true income of a number of individuals is higher than is represented by the sickness benefit, or in the form of over-insurance, when the true income is lower than is represented by the sickness benefit. These errors have been estimated to lie mainly in the direction of under-insurance, however (135).

TABLE XXVI. Sickness benefit in Swedish crowns (median, mean value and standard deviation) and disability pensions (DP) among psoriatics (total group) and matched controls (1 Jan. 1970).

Age at follow-up	Psoriatics (P)					Controls (C)					Difference P-C	
	n ^a	Median	Mean value	±SD	DP ^b	n	Median	Mean value	±SD	DP	Significance ^c	
<i>Men</i>												
25—29	29(3) ^d	37	35	12	0	30(2) ^d	43	39	13	0	— ^e	p < 0.05
35—39	27	40	36	13	4	31	43	42	8	0	—	
45—49	49	42	41	12	7	56	43	43	10	0	—	
55—59	53	39	40	25	15	65	42	47	24	3	—	
<i>Women</i>												
25—29	92	22	21	13	0	89(3) ^d	31	24	14	0	—	p < 0.05
35—39	46	22	21	13	2	48	22	21	16	0	—	
45—49	40	28	26	12	2	40	22	20	13	2	+	
55—59	35	28	25	11	4	33	21	21	15	6	+	

^a number of individuals with sickness benefit

^b number of individuals with disability pension

^c calculated on the difference in each matched pair

^d the figures in parentheses indicate number of students

^e a minus sign indicates a higher sickness benefit in controls than in psoriatics.

Sickness benefit is an uncertain variable from yet another aspect. For married women the husband's income or rather the total income of the family is of greater importance than the woman's own income. No study of the total family income was made in this investigation. To some extent the division into social classes discussed above will probably reflect some of the information that would have been obtained had this been done.

Information on sickness benefit was obtained from the registers of the Regional Social Insurance Offices. In this way the whole material of psoriatics could be studied, thus including those who did not take part in the follow-up.

Changes of income between 1965 and 1970 could be obtained from the difference in sickness benefit after correction for the difference in the sickness benefit scales on these two occasions. There was no noticeable change of

income in the highest sickness benefit class, however.

Comparison with the matched controls was made.

In the analysis of incomes persons receiving a disability pension were excluded, as they get no sickness benefit.

Results and comments. In psoriatics of both sexes a higher income with increasing age was found (though this was not significant) (Table XXVI).

On comparison with the matched controls, marked differences were noted. The psoriatic men had a lower income than their controls both in 1965 (non-significant) and in 1970 (significant), estimated on the difference in sickness benefit in each of the matched pairs. The psoriatic women had a higher income than their controls both in 1965 and in 1970 (non-significant).

When the situation was studied in the different age groups, it was found that the male psoriatics had a somewhat lower income throughout than the controls. The female psoriatics in the youngest age group had a lower income than the controls, and those in the two oldest groups had a higher income than the controls.

For the men, changes in income between 1965 and 1970 occurred to the same extent among both psoriatics and controls. The only difference was that in the oldest age group there were more controls than psoriatics in the highest sickness benefit class both in 1965 and 1970 (significant difference).

Among the women the only definite difference as regards change in income between 1965 and 1970 was that in the oldest age group the psoriatics had increased their income more than the controls (significant difference).

There was no significant relationship between the severity of the course of the psoriasis and income, with the exception that men who were in the highest sickness benefit class in both 1965 and 1970 had a milder form of the disease than other men (almost significant). Neither were subjective complaints from the disease related with certainty to income.

As regards the joint involvement among the psoriatics, for the men a lower income was found in those with reduced functional activity as classified according to Steinbrocker *et al.* (131) (significant). For the women a lower income was found in those who had reported joint symptoms than in those who had not (significant).

The picture of the financial situation as reflected by the sickness benefit was not unequivocal. For the men the psoriatics showed a somewhat lower level of income than the controls, and there was some relationship (though not significant) between lower income and more severe psoriasis, especially in combination with more joint symptoms. This tendency could be expected as the Inquiry into

Low Incomes had shown a relationship between lower income and greater morbidity (135). In contrast to the findings for the men, the psoriatic women showed a higher income than the female controls. The income level of the women was not related to the severity of the psoriasis, however.

Disability pension

Present investigation.

The variable. Disability pensions are given to persons whose capacity to work has been judged to be permanently reduced to at least half. This evaluation is based on extensive medical certificates.

Information on disability pensions and the lengths of time for which they had been received were obtained from the registers of the Regional Social Insurance Offices. The reasons for disability pensioning were obtained from the medical certificates, which were placed at disposal by the Regional Social Insurance Offices.

The study concerning disability pensions was made on the whole material of psoriatics, including those who did not take part in the follow-up.

Comparison was made with the matched controls.

Results and comments. In 1965 a disability pension was being received by 7 % of the psoriatic men and 2 % of the women, and in 1970 by 14 % of the men and 4 % of the women. Most of those receiving a disability pension belonged to the oldest age groups (Table XXVI). In comparison with the matched controls, there was a greater frequency of disability pensioners among the male psoriatics (significant), while there was no difference as regards the women.

There was no relationship between disability pension and civil state.

Men with a disability pension had had a significantly more severe course of psoriasis than those without. Both men and women

with a disability pension had had more subjective complaints from their skin disease (almost significant) than the other psoriatics.

As regards the reasons for disability pensions, it was found that for just under half (42 %) of the men psoriasis was the main diagnosis, in most cases combined with joint involvement (polyarthritis). An equally common reason, however, was psychological disorders, usually associated with alcoholism.

None of the psoriatic women receiving a disability pension had psoriasis as the main diagnosis. In all except one case the reason here was psychological disorders.

Of the matched controls, the reason for disability pensioning in the men was psychological disorders in all cases; in the women the reasons were rheumatoid arthritis, liver diseases and sequelae from physical injuries.

These findings may be considered in the light of information from the National Social Insurance Board (135) that for all disability pensioners in Sweden the dominating cause of disablement at all ages and for both sexes is the disease group consisting of mental diseases, psychoneuroses and pathological personality types, answering for 40 %, followed by diseases of the skeleton and organs of movement, answering for 17 %.

As joint involvement was common among the psoriatics receiving a disability pension, forming part of the main diagnosis in about one third of the cases and also occurring in many others, though to a lesser extent, a comparison was made with the persons with rheumatoid arthritis in the Stockholm region studied by Allander (2). A higher frequency of disability pensions was found among these latter than among the psoriatics of the present study; this despite the fact that the rheumatoid arthritics constituted a population material, in contrast to the psoriatics, who were taken from a hospital population and thus could be assumed to have a greater possibility of receiving disability pensions.

The mean age of the rheumatoid arthritics was higher than that of the psoriatics. This is of importance for the comparison, as disability pensioning is more common at higher ages.

The difference between psoriatics and rheumatoid arthritics could not be explained with certainty from the available information, as the reasons for disability pensioning of the latter were not given. It is conceivable, however, that rheumatoid arthritics get a disability pension more easily, as the functional reduction is often more obvious objectively in a case with joint involvement than in a skin disease. This possibility is in fact supported by the finding that it was mainly psoriatics with joint involvement who were given disability pensions. The difference between the two groups may also be an expression of varying attitudes in the evaluation of permanent reduction of the capacity to work. The often episodic course of the skin disease obviously plays a role here. An essentially continuous course dominated the picture in the psoriatics of this investigation, however.

D. SUMMARY AND DISCUSSION OF THE SOCIAL SITUATION

The factors expressing the social conditions among the psoriatics in the investigated material have hitherto been treated separately, but in order to obtain a more assembled picture of the social situation they must be seen in their proper context.

The men in the studied material were relatively somewhat older than expected in consideration of the age distribution in the city population from which they were obtained. They were more frequently unmarried, less frequently married and more frequently divorced than the controls. They had a lower housing standard, which would seem to be

associated with the higher frequency of single men among the psoriatics.

The men had a lower school education than the controls. On the other hand they had undergone vocational training to a higher extent. They were gainfully employed to a somewhat smaller extent and belonged to a lower social class than the controls, they showed a higher frequency of disability pensions and had a lower income from gainful work (as represented by sickness benefit).

The differences between the psoriatic men and the controls were small throughout and in many cases of low or no statistical significance. All variables used indicated a relatively uniform social pattern among the psoriatic men, a pattern that corresponded to the findings in other connections, e.g. in the Inquiry into Low Incomes, where increased morbidity was found to be related to a lower educational level, social class and income (68, 135).

The women of the psoriatic material exhibited a different social pattern. They were relatively younger than expected in consideration of the age distribution in the population, and were also considerably younger than the men. Like the men, they were somewhat more frequently unmarried, less frequently married and more frequently divorced than their controls. Their housing standard was of the same level as that of the controls and higher than that of the men.

The women's school education did not differ from that of the men, and again was somewhat lower than that of the controls. The women had a higher level of vocational training than the controls. They also showed a higher frequency of gainful employment, which was probably partly connected with the higher frequency of single women among the psoriatics than among the controls. The women belonged to a higher social class and had a higher income than the controls, but received disability pensions to the same extent.

Several of the differences between the psoriatic women and the controls were relatively large and of statistical significance, e.g. those concerning gainful employment and social class and, for the older persons, income.

Of great importance for the interpretation of the results was the extent to which relationships could be found with any of the factors expressing the psoriasis, and the strength of such relationships. In analysing this question the age at onset of the psoriasis was one of the main factors considered in an attempt to illustrate to what extent the presence of psoriasis during childhood and the early period of life may noticeably affect the conditions in later years. Further factors considered were the severity of the course of the disease as evaluated by the examining physician (the author) and the subjective complaints from the disease, i.e. as experienced by the psoriatics themselves. Among the men it was somewhat easier to find relationships between variables in the social pattern and the severity of the course of the disease, and in some cases also an early onset, but relationships with the subjective complaints were seldom found.

Among the women, on the other hand, the severity of the course of the psoriasis could seldom be related to the variables expressing the social situation. This was mainly connected with the fact that in the women the course of the disease was usually mild or moderate. The subjective complaints from the disease were more frequently related to the social variables, however.

Thus, if the social variables could not be related convincingly with the degree of severity of the skin disease, this may have been due to the fact that the variables used to reflect the psoriasis may have been too obtuse to result in significant relationships. It is possible, further, that the groups were too small for statistical significance to become evident, or that other factors than psoriasis *per se* were of greater importance. One factor which appears of interest and possibly of

much importance is the general morbidity of the psoriatics. Another is their need for health services or rather, perhaps, their possibilities

of having this need fulfilled. These factors will be elucidated to some extent in the following.

VII. GENERAL MORBIDITY

Two methods were used in evaluating the morbidity of the psoriatics. One involved a study of their sick leave from data filed at the Regional Social Insurance Office, with whose assistance controls matched for sex, age and place of residence were selected for comparison (see p. 11). The other involved a study of the previous and present state of health of the psoriatics as described in the questionnaire; for this part of the study participants in two earlier health screening projects were used as controls (see p. 11).

A. SICK LEAVE

General

To what extent the amount of sick leave accurately reflects a person's morbidity is a fundamental question. This question has several facets:

a) for short sick leaves (less than 8 days) the Regional Social Insurance Office requires only the sick person's own information on the reason for the sick leave. The reliability of these "diagnoses" must be regarded as relatively low. At times short periods of sick leave may even be an expression not of the person's own illness but of the illness of a relative, e.g. child;

b) for periods of sick leave exceeding 7 days, and in certain cases also for shorter periods, if these are repeated frequently, a doctor's certificate is required. Of importance then is whether the doctor's diagnosis has been medi-

cally correct, e.g. diagnosis of eczema in a person with psoriasis, and whether, if the patient has suffered from several diseases but the doctor has only reported one, this diagnosis was medically the most important for the sick leave. If a psoriatic person suffered from joint symptoms, it is possible that the latter was the predominant reason for incapacity to work but that the diagnosis given was nevertheless psoriasis;

c) of great importance is the extent to which the sick leave reflects true incapacity to work and in what way this incapacity has been evaluated. Here, for example, the working conditions play a decisive role. The patient's own evaluations may often be of greater importance than those of the doctor (87, 88);
d) for persons with a disability pension only the number of days for which the patient has been hospitalized is recorded, and no other form of illness, as this does not involve any sickness benefit for incapacity to work from the point of view of the Regional Social Insurance Office. Thus for disability pensioners the register cannot be used in the same way as for other persons;

e) there are also other groups of persons for whom the regulations in Sweden imply limitations in sick leave recorded by the Regional Social Insurance Office, *viz.* persons above and below a certain age, persons in military service and women during leave of absence for pregnancy;

f) before 1967 the principle of three "days off" was applied, and since that year there has been one "day off", for which no sickness benefit is paid. Since in the register of the

Regional Social Insurance Office only the number of days for which sickness benefit is paid, i.e. sickness benefit days, is finally entered, before 1967 sick leave of one to three days was not recorded, and after 1967 sick leave of one day.

Sick leave for psoriasis and for other diseases

Previous investigations. No studies concerning sick leave with special regard to psoriasis have been made previously.

Present investigation.

The variables. The sick days entered in the register of the Regional Social Insurance Office (sickness benefit days — see p. 22) were divided into so called psoriatic sick days, i.e. sick days where the reason for sick leave was stated to be psoriasis, and non-psoriatic sick days, where the reason given was another disease. Joint symptoms which were not associated with psoriasis in the diagnosis were counted as another disease. There was an uncertainty factor here, depending directly upon the accuracy of the diagnosis given by the doctor providing the medical certificate.

The purpose of this division of the sick days was to get an idea of the extent to which the sick leave of the psoriatics was due mainly to psoriasis or to other diseases.

In the study of the relationship between sick leave and psoriasis the following variables were used: age at onset, duration, severity of the course of the psoriasis, subjective complaints from the disease, the occurrence of joint symptoms in general and the extent of clinical and of roentgenological (by erosions) joint involvement.

As the information on sick leave was obtained from register data, the whole of the relevant material of psoriatics could be studied, i.e. including those persons who did not participate in the follow-up.

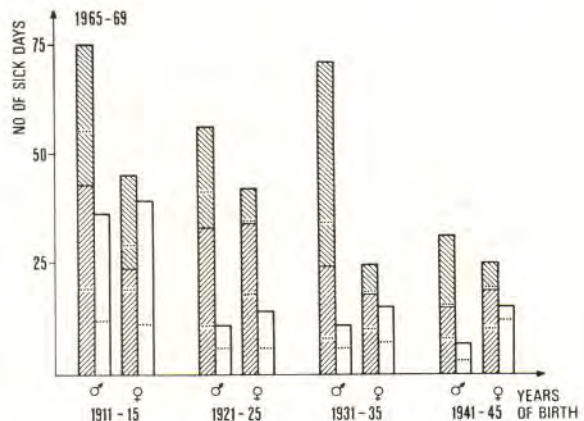
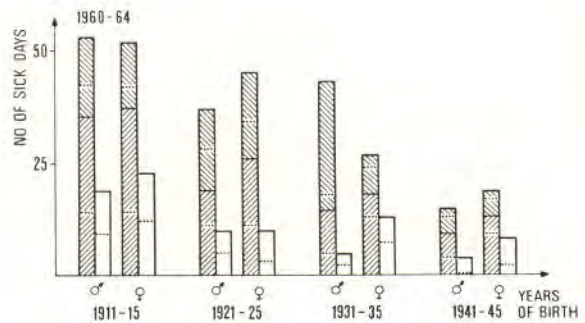
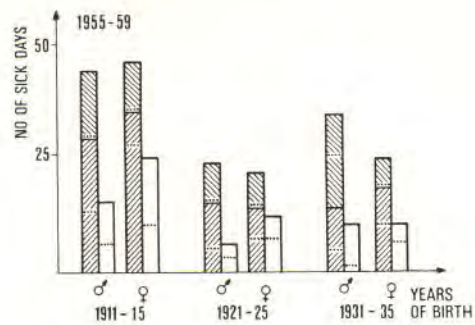


Fig. 11. The mean number of sick days per year during the five-year periods 1955-59, 1960-64 and 1965-69 (— mean value, . . . median) for psoriatics, divided into psoriatic sick days (▨) and non-psoriatic sick days (▩) and for matched controls (□).

TABLE XXVII. Differences in the mean number of sick days per year (mean values) during the five-year periods 1955-59, 1960-64 and 1965-69 between psoriatics (total group) and matched controls.

Age groups (yrs of birth)	1955-59					1960-64					1965-69				
	Non-psob			Pso + non-psoc		Non-pso			Pso + non-pso		Non-pso			Pso + non-pso	
	n ^a	\bar{d} ^d	s ^e	\bar{d}	s	n	\bar{d}	s	\bar{d}	s	n	\bar{d}	s	\bar{d}	s
<i>Men</i>															
1941-45						32	5	—	10	***	32	7	*	24	***
1931-35	30	7	—	28	**	29	7	—	40	***	29	13	—	62	***
1921-25	56	8	*	17	***	55	9	*	28	***	53	23	*	47	***
1911-15	66	14	*	29	***	64	16	—	34	***	60	4	—	36	**
<i>Women</i>															
1941-45						92	4	—	11	***	92	4	—	10	**
1931-35	47	9	*	14	***	47	6	—	15	**	47	3	—	7	—
1921-25	41	3	—	8	—	40	16	*	35	***	39	12	—	20	*
1911-15	39	9	—	20	*	38	15	—	27	**	36	17	—	5	—

^a number of persons with registered sick days

^b number of non-psoriatic sick days compared with total number of sick days of the controls

^c number of psoriatic sick days + non-psoriatic sick days compared with total number of sick days of the controls

^d mean value of the intraindividual differences in matched pairs

^e significance of the difference: — no significance, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Comparisons were made with the matched controls. For the latter only non-psoriatic days applied.

Results and comments. Fig. 11 presents the mean sick leave per year, expressed in sick days, for the period 1955-69 divided into three five-year periods. In the figure both the mean and median values are given for each sex and age group and for the respective matched controls.

The non-psoriatic sick leaves were longer throughout than the sick leaves due to psoriasis. This held for all three five-year periods and for all sex and age groups. An exception was made by the men of ages 35-39 years. These included some persons with severe psoriasis, who had had sick leave for long periods during different forms of work training. Had

they been older they would probably have been receiving a disability pension. The difference between psoriatic sick days and non-psoriatic sick days was significant for both sexes. For the women the difference was also significant in certain individual age groups.

The number of sick days increased with age in both sexes, both those due to psoriasis and those due to other diseases. The increase was greater for non-psoriatic sick days, however.

When age had been taken into account, the men had more sick days than the women, both those due to psoriasis (non-significant) and those due to other diseases (highly significant).

It was not found that persons with a large number of psoriatic sick days significantly

TABLE XXVIII. Relationship between sick leave and certain variables concerning psoriasis and joint involvement after the age factor had been taken into account.

Variable	Psoriatic sick days		Non-psoriatic sick days	
	♂	♀	♂	♀
Severity of course of psoriasis	***	***	—	—
Subjective complaints from psoriasis	**	***	—	**
Age at onset	—	**	—	—
Duration of psoriasis	—	—	—	—
Joint symptoms in general	—	***	—	*
Extent of clinical joint involvement	**	—	—	**
Extent of roentgenological joint involvement	***	—	—	—
Functional capacity according to Steinbrocker <i>et al.</i>	***	—	—	—
Subjective complaints from joint involvement	**	***	—	—

Significance limits: — no significance, * $p < 0.05$, ** $p < 0.001$, *** $p < 0.001$.

more often had a large number of non-psoriatic sick days than persons with a smaller number of psoriatic sick days.

In the comparisons with the matched controls the number of non-psoriatic sick days was found to be larger throughout in the psoriatics than the total number of sick days in the controls. This difference was significant for the men and almost significant for the women. The difference was also almost significant in certain individual age groups (Table XXVII). When the total number of sick days of the psoriatics was compared with the sick days of the controls the difference was highly significant for both sexes: a highly significant difference was also found in most age groups.

The controls also showed an increase in sick days with increasing age, to the same extent as the non-psoriatic sick days of the psoriatics.

The relationship between sick days and variables expressing the degree of severity of the psoriasis and joint involvement is presented in Table XXVIII.

The psoriatic sick days were highly significantly related to the severity of the course of the psoriasis both in men and women — the more severe the course the greater the

number of sick days, which was natural. The number of non-psoriatic sick days, on the other hand, was not significantly related to the severity of the course of the disease.

The subjective complaints from the psoriasis were more strongly related to the number of psoriatic sick days among the women (highly significant) than among the men (significant). Among the women there was also a relationship (significant) between more subjective complaints from the psoriasis and a larger number of non-psoriatic sick days; this was most marked in the two age groups 25—29 and 55—59 years. No such relationship was found for the men.

This relationship between degree of severity of the psoriasis and sick days was somewhat remarkable in view of the marked difference in the severity of the psoriasis between men and women (p. 28). It is probable that in reality the women had sick leave for considerably milder forms of psoriasis than the men. That the women experienced more trouble from their skin disease than the men, at the same degree of severity, as has been shown previously (p. 31), also fitted into the pattern since, as has also been mentioned earlier, the

patient's own evaluations are often more decisive for sick leave than those of the doctor concerned.

As regards joint symptoms, a stronger relationship between the expressions of joint involvement and the psoriatic sick days was found throughout for the men than for the women. For the women a relationship was also found between joint involvement and non-psoriatic sick days, which was not observed for the men.

This sex difference might be an expression of differences in the recording of joint symptoms, i.e. in the diagnosis given as the reason for sick leave. It is possible that in persons with severe forms of psoriasis the doctor giving the medical certificate may associate joint symptoms with the skin disease and give psoriasis as the diagnosis with no information on joint symptoms. For persons with milder forms of psoriasis he may possibly do the opposite, i.e. give joint symptoms as the diagnosis without mentioning the psoriasis. The recording system did not allow a retrospective evaluation of the correctness of the diagnosis.

Sick leave and social conditions

Previous investigations. The relationship between sick leave and social conditions has not been studied previously with special regard to psoriasis. In other connections, however, clear relationships have been shown between sick leave and social conditions of the kind treated here. The situation was investigated thoroughly, for example, in the Inquiry into Low Incomes (135). Although criticized on certain points, the results of this investigation well elucidated the relation between morbidity (represented by sick leave data) and social conditions in Sweden in the middle of the 1960's.

In the Inquiry into Low Incomes it was shown that at a given age the civil state was more strongly related to morbidity than was

the sex. Single men had a considerably higher morbidity than married men, which was in line with the finding that single men showed a lower frequency of gainful employment and similarly a lower income from gainful employment, even for full-time work, than married men. In women, however, a higher morbidity among single persons was not accompanied by a lower frequency of gainful employment or a lower income from gainful employment in relation to married persons.

At ages below 45 years the women had a higher morbidity than the men, while at ages above 45 years the men, regardless of civil state, had a higher morbidity than the women. The morbidity increased successively with increasing age. This increase was relatively greater below the age of 45 years than above, but it was about the same in both sexes.

A marked relationship was found between morbidity and education. This was strongest for men of ages 25—44 years, where persons with an elementary education had a 3 1/3 times higher morbidity than those with a university education. For women, and also for men over 45 years, this ratio was 2:1. It was suggested that these findings might be due to the effect of different living conditions, types of occupation and work place conditions between persons with different levels of education.

The relationship between higher morbidity and lower frequency of gainful employment was also clearly apparent. It was found that with long periods of illness a large number of the health-insured gainfully employed persons left their jobs to change to non-gainful or part-time gainful employment. A larger proportion of persons with long periods of illness were found among part-time than among full-time workers. This difference between full-time and part-time workers was considered to be connected with the greater difficulties of persons of poor health to get full-time work than persons in good health. The observed difference in morbidity between

TABLE XXIX. Relationship of sick leave and state of health to variables concerning social conditions after the age factor had been taken into account.

Variable	Sick days		Previous state of health		Present state of health	
	♂	♀	♂	♀	♂	♀
Civil state	—	—	**	**	**	**
School education	—	—	—	—	**	**
Gainful employment	**	—	—	—	***	*
Social class	*	—	—	—	**	—
Sickness benefit	**	—	—	—	—	—

Significance limits: — no significance, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

full-time and part-time gainfully employed persons was most pronounced among older men; it was negligible among the women. Assuming that part-time gainful employment was an expression of higher morbidity and that the men's connection with the labour market was firmer than that of the women, this accentuated the differences in morbidity between full-time and part-time workers among the men. In the event of a high degree of morbidity the women changed to a greater extent to non-gainful employment, mainly as housewives.

As regards income, in the Inquiry into Low Incomes the definite conclusion was drawn that the higher the income the lower the morbidity. Different variables for income were used here than in the present study, but in principle this does not change the comparisons.

Further, a distinctly lower morbidity with higher social class was observed. This was not studied from the aspect of sick leave, however, but with respect to the occurrence of different signs of disease (68).

It must be added here that these relationships referred to conditions that were considered representative for the whole country, and not to big cities alone.

Present investigation.

Results and comments. In the present material of psoriatics the relationships between the studied social variables and the morbidity as reflected by the sick days (actually sickness benefit days) during the five-year period 1965—69 were as follows (psoriatic sick days and non-psoriatic sick days combined) (Table XXIX): The men had a higher morbidity than the women. Civil state was related relatively weakly to morbidity, and for a given age sex was of greater importance for the morbidity than the civil state, in contrast to what was expected in view of the findings described above; as pointed out, however, these referred to the whole country. Single men had a somewhat (but not significantly) higher morbidity than married men and followed the general morbidity pattern mentioned above by having a somewhat lower degree of gainful employment and a lower income from gainful employment (represented by sickness benefit) than married men; these latter relationships were not statistically significant either, however. Also among the women, single persons had a somewhat (but not significantly) higher morbidity than married persons, but they had a higher degree of gainful employment and a higher income from gainful employment

than married women, which thus differed from the pattern described above.

Both younger and older men had a higher morbidity than the women, which deviated from the expected finding, namely that younger women (under 45 years) would have a higher morbidity than the men. Further, the increase in morbidity with increasing age was somewhat greater among men than among women; this was evaluated here as the increase in sick days during the three studied five-year periods for each of the age groups.

A higher morbidity was found to be only slightly related (and without significance) to a lower education, in both sexes. This is in contrast to the strong relationship between higher morbidity and lower education found in the Inquiry into Low Incomes, and which has also been observed in other investigations, e. g. for patients with rheumatic diseases both in Sweden (2) and in the U. S. A. (44). This was of interest in consideration of the high frequency of joint symptoms among the psoriatics of the present study.

The relationship between higher morbidity and lower degree of gainful employment was clearly evident among the men (significant). The few men with part-time work did not have a higher morbidity than those with full-time work, however. In women, on the other hand, there was no relationship between morbidity and frequency of gainful employment.

There was a relationship (almost significant) between lower social class and higher morbidity among the men, while among the women social class and morbidity were not related.

Finally, among the psoriatic men there was a clear (significant) relationship between higher morbidity and lower income from gainful employment (represented by sickness benefit). No relationship between morbidity and income was found among the women.

The pattern found for the men thus corresponded essentially to what could be expected in the light of the relationships found

previously between morbidity and social variables for the country in general. The women, on the other hand, deviated from the general pattern in essential points, and the picture of the social conditions among the studied psoriatics was therefore not a uniform one.

It should perhaps be pointed out again here that these relationships of different social variables to the morbidity in general and to the expressions of the severity of the psoriasis do not say anything in themselves on causal relationships. A low education and a low income are both conceivable causes of higher morbidity and of deteriorations in the psoriasis as a consequence of poorer working conditions and fewer possibilities of rehabilitation after illness. On the other hand, a higher morbidity or more severe forms of psoriasis may contribute to preventing the person concerned from acquiring a higher education or getting more qualified (better paid) work.

B. PREVIOUS AND PRESENT STATE OF HEALTH

General

The source of information used with regard to the previous and present state of health was the answers given by the examinees themselves in the questionnaires. The previous state of health concerned mainly previous care for different diseases and may thus be regarded as some measure of the utilization of health services for other causes than psoriasis. The present state of health constituted a report of symptoms occurring at the time of the follow-up. Some considerations on the validity of utilizing auto-anamnestic data would seem to be appropriate here, even though this has been discussed to some extent in earlier chapters (pp. 15 and 31).

Remarkably few studies have been made concerning the reliability of auto-anamnestic

data (4), but those reported show the importance of penetrating this subject further. Linder (86), for example, in an investigation from the U. S. A., found that mild symptoms of different kinds were forgotten within four weeks in 75 % of the cases, while symptoms requiring contact with a doctor or limitation of activities were remembered for a considerably longer period. Westrin (145) showed recently how single periods of sick leave due to back symptoms were forgotten by one person out of four, while symptoms with a tendency to recurrence were forgotten to a considerably smaller extent. This points to a serious risk of undervaluation of the occurrence of disease manifestations in auto-anamnestic retrospective studies, a situation which has received much too little attention in the medical literature as a whole.

When it comes to the collection of information, the choice lies between questionnaires and interviews. As previously mentioned, the questionnaire method has advantages over interviews in its lower cost and its possibilities of eliminating the sometimes marked interview effects. However, it involves less flexibility — no possibility of helping the respondent who has misunderstood a question. Also, one cannot be certain that the intended person has given the answers. The non-participation increases, furthermore, and there is less possibility of dealing with sensitive and complex subjects. The greatest advantage lies in the ability to standardize the questions and thus allow comparisons between different investigations.

It has been mainly the development of health investigations and of computer storage of health records that has led to greater standardization of auto-anamnestic information (30, 31, 48, 54, 99). As mentioned previously, Collen *et al.* (31) and Mellner (99) have reported good results from studies of the reliability of standardized questions. Mellner's study comprised in fact most of the questions concerning previous and present state of health

given in the questionnaire section of the present investigation.

Among the possible sources of error in the collection of auto-anamnestic information through standardized questionnaires, purely linguistic factors are of great importance, in view of the variations in the use and understanding of a language in different parts of a country and among population groups with different educational levels. Among the preliminary studies preceding this investigation, a study was made of the reading habits of hospitalized dermatological patients. The majority were psoriatics, of whom about one-fourth were included in the present material. They were found to be greatly accustomed to reading newspapers and books, as compared with the estimated average reading habits of the population (100). It was concluded from this preliminary study that the psoriatics to be investigated, all of whom had been hospitalized according to the selection criteria, were probably accustomed to reading and had a degree of contact with the language which was not appreciably inferior to the supposed degree in the state employees, whose answers to the same questions were to be used for comparison. It was assumed here that the state employees, though selected from the approximately 80,000 state employees in the Stockholm region and thus representing all possible categories in government service, had, on the average, a relatively extensive linguistic capacity.

Furthermore, the psoriatics and the groups used for comparison in this part of the study were resident in the same region of the country, which was also considered to reduce the risk of wide variations in language.

The different questions in the questionnaire had to be written simply and had to consist of single questions. The number of subsequent questions had to be kept low so that the total volume of questions should not be too large. Thus, a study of the answers to these questions alone could only be of a general

orientational nature. The findings, i.e. the positive answers, had to be followed up by new questions and complemented by physical examinations and laboratory tests before their validity could be established. A comparison of these answers between different groups of persons therefore had to be considered in regard to the low reliability of the method. The standardization of the questions and the answer situation justified its use in the present investigation, however. Marked differences between the studied groups could therefore be of importance, while the absence of or smaller differences were of little informational value.

Previous state of health

Results. The number of answers concerning previous state of health increased with increasing age (significant) (Table XXX). There was no sex difference, on the other hand.

In Table XXXI those questions are presented for which significantly different answers were given by the psoriatics and the participants in the two health surveys, together with the frequency of positive answers given by the psoriatics. The frequency figures for questions which were answered similarly by the psoriatics and the controls are not given here.

Of especial interest were answers concerning:

- nervous symptoms, which were more common in the psoriatics than in the controls, especially the HSCC controls,
- joint and back symptoms, which were more common both in male and female psoriatics of the two oldest age groups than in the controls,
- physical injuries, which were more common in psoriatic men than in both types of controls,
- infections in the upper respiratory tract, which were somewhat more common in the psoriatics. Infections that had been treated in hospital were reported more frequently by psoriatics and infections treated outside hospital more frequently by HSSE controls,

TABLE XXX. Previous and present state of health of psoriatics in different age and sex groups. The mean values, standard deviations and medians of the number of affirmative answers are given. The highest possible number of affirmative answers concerning the previous state of health is 55 for men and 59 for women, and concerning the present state of health 117 for men and 122 for women.

Age	Number of "yes" answers concerning					
	Previous state of health			Present state of health		
	Mean value	±SD	Median	Mean value	±SD	Median
<i>Men</i>						
25—29	3	2	2	5	5	3
35—39	5	3	5	7	7	3
45—49	6	3	5	10	9	8
55—59	6	3	5	12	11	9
<i>Women</i>						
25—29	5	3	4	11	7	9
35—39	5	3	4	10	8	8
45—49	6	4	6	14	11	12
55—59	8	5	8	17	12	14

e) gonorrhoea, which had occurred more frequently among male psoriatics than among the controls,

f) reactions to drugs ("hypersensitivity"), which had occurred more frequently in the psoriatics than in the controls, especially the HSCC controls.

Comments. Several authors have considered nervous problems and psoriasis to be related, and the former have been especially mentioned as provoking factors both for the onset and for exacerbation of the disease (16, 65, 90, 106, 126, 133, 146). This is a complicated question, however. The fact that many patients who seek medical advice for exacerbation of their psoriasis, for example, also state that they have nervous troubles, may mean that persons with nervous troubles, when they have an exacerbation of their skin disease and possibly increased nervous symptoms, more often seek medical aid than persons without

TABLE XXXI. Questions concerning previous state of health, in the questionnaire. The degrees of significance in "yes" answers between psoriatics (P) and HSSC controls in different age and sex groups are given. The frequency of "yes" answers is given for psoriatics in cases where the difference in "yes" answers has any degree of significance. For the complete questionnaire, see Appendix II.

Question number	Question	Age, sex	Frequency of "yes" answers	Differences between	
				P — HSSE	P — HSSC
<i>Previous state of health</i>					
26	gallstones	D m ^a	19 %	**b	
28	nephritis	D w	15		*
535	gonorrhoea	A m	25	nt ^c	*
		B m	21	**	**
		C m	23	*	**
		D m	21	**	*
		B m	36		**
33	nervous troubles	D m	34		**
		D w	41		*
		C m	34	***	
36	lumbago, sciatica	C w	28	***	
		D m	53	***	
		D w	41	***	
<i>Previous hospitalization</i>					
604	physical injury after accident	B m	23	*	
		C m	48		**
		C w	23		*
		D m	40	***	*
60	diseases of nose, throat	B m	32		***
		C w	23	**	*
<i>Previous treatment by doctor (not hospitalized)</i>					
71	ear disease	C m	32		**
72	diseases of nose, throat	B w	18	-*d	
		C m	25	-*	
		D m	21	-*	
		D w	44		*
75	gastrointestinal disease	B w	25	*	*
		D m	19	*	
607	rheumatic symptoms	C m	25		***
606	nervous troubles	D w	37		**
		B m	32	**	*
		B w	23		*
		D m	23	**	*
		D w	41		**
549	urinary tract infection	D w	30		*
79	hypersensitivity to drugs	B w	30	**	***
		C m	18		*
		C w	31		*

a age groups: A 25-29 years, B 35-39 years, C 45-49 years, D 55-59 years

b degree of significance: p<0.05, p<0.01, p<0.001

c not tested

d the minus sign indicates a higher frequency of "yes" answers among controls than among psoriatics.

nervous troubles but with otherwise the same psoriatic situation.

Nervous symptoms are also common in chronic diseases in general. Many persons with alcoholic troubles often describe these as nervous symptoms. The symptom group comprising nervous symptoms is large and heterogeneous and has only been touched upon briefly here. It is clear, however, that a detailed study of these problems from a psychiatric aspect would be of great value; such a study should not only be concerned with psoriatics associated with hospital services but should pay special attention to those who are seldom or never hospitalized.

That rheumatic symptoms were reported more often by the psoriatics than by the controls corresponded with the high frequency of joint symptoms found among the psoriatics of this study (Chapter V).

Infections of the upper respiratory tract have been considered to occur more frequently in psoriatics than in other persons, and such infections induced by streptococci, in particular, have long been associated especially with acute guttate psoriatic eruptions (38, 59, 76, 103, 105, 156).

Higher figures for previous infections among the psoriatics were expected, but the frequency figures for upper respiratory tract infections in particular would seem to be more unreliable than most of the others in this section.

The high frequency of previous gonorrhoeal infection is worthy of note. This has been discussed earlier in the section concerning prostatic-vesiculitis (p. 65).

A relationship between psoriasis and allergic conditions has been greatly discussed (126), but will not be treated at length here. The high frequency of drug reactions reported by the psoriatics was probably not only an expression of a tendency to allergic reactions but should also be considered in the light of the higher consumption of drugs (see below).

The higher frequency of physical injuries among psoriatic men was noteworthy. This may be associated with such factors as type of occupation and working conditions, as well as alcohol consumption. Those psoriatics who reported physical injuries all had manual work. An analysis of the distribution of occupations among the controls was not possible, but in general there was a considerably higher frequency of desk-work among the state employees than among the psoriatics. The psoriatics who reported physical injuries had, on the average, mentioned a somewhat higher alcohol consumption than those who did not report such injuries, but as the internal non-participation concerning the questions on alcohol consumption in the questionnaire was considerable, the importance of this factor could not be analysed in detail. Further, no information was available on the alcohol consumption of the controls.

Present state of health

Results. The number of answers concerning the present state of health (symptoms) increased with increasing age (significant) (Table XXX). On the average the women reported more symptoms than the men, when age had been taken into account.

Questions to which significantly different answers were given by psoriatics and controls are presented in Table XXXII. In the same way as in Table XXXI, only frequencies of answers for the psoriatics are given, and only for the questions where there were significant differences between them and the controls. The following questions were of particular interest:

- a) again, rheumatic symptoms were reported more frequently by the psoriatics than by the controls,
- b) drugs such as analgesics and sedatives were reported to be consumed regularly more frequently by the psoriatics than by the controls, and in general regular drug consumption was more common among the psoriatics than

TABLE XXXII. Questions concerning present state of health, in the questionnaire. The degrees of significance of "yes" answers between psoriatics (P) and HSSE and HSCC controls in different age and sex groups are given. The frequency of "yes" answers is given for psoriatics in cases where the difference in "yes" answers has any degree of significance. For the complete questionnaire, see Appendix II.

Question number	Question	Age, sex	Frequency of "yes" answers	Differences between	
				P-HSSE	P-HSCC
<i>Present state of health</i>					
3	rheumatic joint complaints	C m ^a	18	nt ^c	**b
		D w	23	nt	**
4	high blood pressure	D w	22	nt	*
7	gastrointestinal diseases	D w	15	nt	*
<i>Medicines taken at present</i>					
24	analgesics	D m	17	nt	**
		D w	26	nt	*
26	tranquillisers	C w	23	nt	*
		D m	23	nt	*
39	regular medicines	D w	33	nt	**
		B m	41	***	***
		B w	34	***	
		C m	36	**	*
		C w	39	***	
		D m	32	***	
		D w	56	*	*
<i>Present symptoms</i>					
40	headache	A m	16	nt	-***
		B m	23	_-***d	-***
		B w	41	_-**	*
		C m	16	_-***	_-***
		D m	17	_-***	_-***
54	dizziness, blackening before the eyes	D w	29	_-**	_-***
		B w	41	**	***
		C m	21	*	**
		C w	38	***	
63	heartburn	D m	26	**	**
		D m	17	*	
70	discomfort or pain in the chest: on exertion	C m	21	**	
		D m	17		*
		D w	33	*	***
71	: when excited	D w	37	*	***
72	: when it is cold	D w	26	*	*
73	: when going uphill or upstairs	D m	26	**	**
76	this disappears when resting	C m	30	**	***
		D m	28	*	***
		D w	37	*	***
84	breathlessness when going upstairs or uphill	A m	28	nt	***
		A w	36	nt	***
		B m	46	***	***
		B w	48	***	***
		C m	46	***	***
		C w	72	***	***
		D m	60	***	***
		D w	78	***	***
86	attacks of palpitations	C m	21	***	***
		D m	23		**
103	pain in the arms	C m	18	***	***
		D m	23	**	***
104	pain in the legs	D w	37	***	***
		C m	27	***	***
		C w	23	*	
		D m	23	*	***
		D w	48	***	***

Question number	Question	Age, sex	Frequency of "yes" answers	Differences between	
				P-HSSE	P-HSCC
109	swelling of lower legs, ankles	B w	34	***	**
		C w	36	*	**
		D w	48		**
120	aching, pain in the sides of the abdomen	A m	24	nt	***
		A w	20	nt	***
		C w	21	*	*
122	pain in pit of stomach	A w	22	nt	*
		B w	23	*	
		C w	21	*	
		D m	28	**	***
126	pain below right lower rib	D w	26	*	***
		A w	16	nt	**
131	change in stools	A m	24	nt	**
		B w	27	***	***
		D m	17		**
132	loose stools	C m	18	**	**
141	frequent cystitis	C w	18	*	*
165	night sweats	B w	21	**	*
		C w	31	**	
		D m	21		**
167	feel the cold much more easily than before	D w	48		*
		A w	21	nt	**
		B w	21	*	
		C m	27	***	***
		C w	28	**	*
		D m	26	***	**

^a age groups: A 25—29 years, B 35—39 years, C 45—49 years, D 55—59 years

^b degree of significance: $p < 0.05$, $p < 0.01$, $p < 0.001$

^c not tested

^d the minus sign indicates a higher frequency of "yes" answers among controls than among psoriatics.

among the controls. This result did not include the local preparations which the psoriatics naturally used to a large extent,

c) headache was the only symptom which was reported significantly less frequently by the psoriatics than by both the HSCC and HSSE controls,

d) pain in the chest, specified as occurring on exertion, on emotional disturbance and when climbing stairs and walking uphill, which disappeared at rest, was more common among the psoriatics than among the controls of both kinds,

e) the psoriatics also reported the occurrence of breathlessness more frequently than the controls,

f) acid regurgitation and pain in the pit of the stomach were more frequent among the female psoriatics and also among the oldest male psoriatics than among the corresponding controls,

g) intestinal symptoms such as changes in the frequency and appearance of the stools were also reported more often by psoriatics than by controls, especially among the men,

h) urinary tract infections occurred more frequently among psoriatic women in the age group 45—49 years than in the corresponding controls,

i) night sweats and also chills were more common among psoriatics of both sexes than among the controls.

Comments. The higher consumption of drugs, especially with regard to analgesics and sedatives, was probably associated with the higher frequency of rheumatic and nervous complaints reported by the psoriatics.

It was an interesting finding that headache was so markedly less frequently reported by the psoriatics than by either the HSSE or HSCC controls. No explanation can be given for this. A high consumption of analgesics on account of joint symptoms could of course reduce headache.

The questions on pain in the chest were constructed in accordance with those introduced by Rose (121) and later used in many connections for screening of cardiovascular symptoms (122). They may, however, also constitute an expression of chronic bronchitis, for example. No relationship between psoriasis and cardiovascular disease has been shown in previous studies. It has been found, on the other hand, that in extensive psoriasis (erythroderma) the blood volume is increased (125), but this is hardly of importance as regards the group of psoriatics of the present investigation.

It is conceivable that psoriasis, by reducing the afflicted person's contacts with other people, which was an experience of many of the psoriatics of this study, may lead to isolation resulting in a combination of physical inactivity, increased smoking and increased alcohol consumption, all of which factors are believed to increase the risk of cardiovascular disorders. It was not within the frame of this investigation to elucidate this problem. It may be stated, however, that there was less obesity among the psoriatics than among the HSSE controls.

The intestinal symptoms were of interest in the light of the discussion concerning dermatogenic enteropathy. It has been shown that malabsorption occurs and is clearly associated with extensive skin involvement (erythroderma) in both psoriasis and eczema (125).

There was another interesting aspect of the intestinal symptoms, namely that both ulcerative colitis and terminal ileitis have been found to be related to arthritic manifestations, especially in the sacro-iliac joints (7,93) (p.67).

The questions concerning gastrointestinal complaints, which the psoriatics answered affirmatively more often than the controls, were given a general formulation. They cannot therefore be used directly as a basis of any diagnoses. Furthermore, several of them may be associated with nervous disturbances. Some of the symptoms may possibly be explained by consumption of drugs.

Associations between psoriasis and endocrine disturbances have been greatly discussed. The sex differences that have been found as regards the age at onset of psoriasis (p. 25) have been considered by some authors to be due to hormonal differences.

Relationships between psoriasis and thyroid disorders, especially hypothyroidism, and diabetes mellitus have been claimed and also questioned (125, 126).

There was an equal frequency of diabetes mellitus among psoriatics and controls in this study.

The questions concerning nocturnal sweats and an increased feeling of cold may, despite their uncertainty, be related to disturbances of the thyroid gland as an expression of possible hyper- and hypoactivity, respectively. From these questions, combined with the information on treatment of thyroid disease — both hyper- and hypoactivity and goitre — which was somewhat more common in the psoriatics than in the HSSE controls, it was concluded that there was possibly a higher frequency of thyroid disease in the former than in the latter.

Relationship with psoriasis

The answers given by the psoriatics concerning their previous and present state of health, both with respect to the number of

affirmative answers and to the occurrence of answers where the psoriatics differed significantly from the controls, were studied regarding the relationship to the severity of the course of the psoriasis and to the subjective complaints from this disease.

It was not found that there was a higher number of answers expressing either previous illnesses or present symptoms in persons with more severe forms of psoriasis than in those with milder forms. A relationship (almost significant) was noted, however, between a higher number of affirmative answers to questions concerning present state of health, and more subjective complaints from the psoriasis, in both sexes.

The questions that were significantly more often answered in the affirmative by psoriatics than by controls were not more frequently answered with "yes" by persons with a more severe form of psoriasis than by those with a milder form. Only certain questions on gastrointestinal complaints were answered in the affirmative more frequently by women with more subjective complaints from their psoriasis than by women with fewer subjective complaints from the disease.

Thus no definite relationship was found between more severe psoriasis and either a greater number of "yes" answers concerning previous or present state of health or any of the questions that had been answered in the affirmative significantly more frequently by the psoriatics than by the controls.

From these findings it was concluded that the morbidity in general, as reflected by the answers given in these sections of the questionnaire, were related to other factors than the psoriasis as such.

Relationship with social conditions

Previous investigations. As part of the Swedish State Commission of Inquiry into Low Incomes, an investigation of the state of health of the adult Swedish population was

made on the basis of interviews comprising a number of questions on different disease manifestations and symptoms (68). The results were not analysed with respect to age and sex. The answers to the different questions were only related to social class. Distinct discrepancies were found between different social classes. For almost all symptoms, a higher frequency of persons in lower classes than in higher classes reported their occurrence.

In their analysis of health care consumption in Sweden and the U.S.A., Smedby *et al.* (5, 6, 127) found that age, sex and civil state were more strongly related to reporting of symptoms (based on an interview investigation) than were education, social class and income. These latter variables were of greater importance, on the other hand, with respect to the tendency to seek medical advice.

Present investigation.

Results and comments. In this material of psoriatics there was a clear relationship between a greater number of reported symptoms ("yes" answers concerning present state of health) and increasing age, for both sexes (Table XXX). With regard to civil state, single persons, especially divorcees and widows or widowers, reported a greater number of symptoms than married persons (Table XXIX). A lower degree of gainful employment and a lower social class also meant a greater number of reported symptoms among the men, which corresponded with the lower degree of gainful employment among the single men. In the women the relationship between a greater number of symptoms and a lower degree of gainful employment was weaker, and the relationship with social class was not significant. There was no relationship between education or income and reporting of symptoms.

As regards the questions concerning the previous state of health, which to some extent could be taken as an expression of the ten-

dency to seek medical advice, as these questions mainly dealt with different forms of previous treatment, the number of affirmative answers increased with increasing age (Table XXX). Further, there was a (non-significantly) greater number of "yes" answers from single persons, especially divorcees and widowers, than from married persons. There was no sex difference here. No relationship was found, however, between previous treatments and the social variables school education, degree of gainful employment, social class or income (Table XXIX).

The pattern that thus emerged from the relationships studied here among this group of psoriatics corresponded in certain respects to the pattern observed in the comparison of health care consumption in Sweden and the U.S.A. (5), i.e. that reported symptoms increased with increasing age, that women reported more symptoms than men, and that single persons, especially divorcees and widows or widowers, reported more symptoms than married persons. These latter relationships are age-dependent, but were still observed in the psoriatic material even when consideration had been taken of age. The pattern did not correspond, on the other hand, with regard to previous ambulatory and hospital care, where a relationship with the studied social variables might have been expected in the light of Smedby's findings that the tendency to seek medical advice was related to these particular factors (5, 127).

C. DO PSORIATICS HAVE A HIGHER MORBIDITY THAN OTHER PERSONS?

A general opinion that has been expressed in many different contexts is that psoriasis is a "disease of the healthy", i.e. that psoriatics have fewer other diseases than people in general. No systematic studies of this question have been made however. Hellgren (59) studied a number of psoriatic patients in relation to matched controls and found a higher frequency of urticaria, rheumatoid arthritis and lumbar pain, mental diseases and different infections such as influenza, bronchitis and skin infections. The data were based, however, on a combination of case record information and interviews, and the method of selection of the matched controls was not stated, so that his results are difficult to evaluate.

In the present investigation comparisons between the psoriatics and different types of controls indicated that there was a higher morbidity in both male and female psoriatics, both when the results were based on sick leave and when they were based on the number of occasions of previous medical care, and its form, and reported symptoms.

The analysis of previous care and reported symptoms did not reveal, however, that the psoriatics had a greater tendency to diseases of any special organs or following any special pattern of reaction. The "hypermorbidity", in comparison with the controls, covered greatly differing parts of the disease panorama. This would seem to suggest that the psoriatics had a tendency to greater morbidity in general.

The important question that remains is to what extent one is justified in generalizing this result to apply, if not to psoriatics in general, at least to psoriatics in a city region.

VII. GENERAL DISCUSSION

A. ASPECTS OF SELECTION FACTORS

It has been pointed out several times in the foregoing how the composition of the material became increasingly important for the evaluation of the results, and how it became more and more doubtful to what extent the findings could be generalized to apply to other psoriatics than those studied here. The hypothesis may therefore be put forward that differences observed between the psoriatics and the controls and between male and female psoriatics, as well as between different age groups, may have been due more to the selection of the studied group than to the psoriasis.

In order to shed light on some aspects of this question, it was chosen to study the number of occasions of hospitalization for psoriasis.

The length of time from the onset of the psoriasis to the first time of hospitalization was found to be the same for men and women in the same age group. On the other hand, considerably more of the younger than of the older psoriatics had been admitted to hospital during the calendar year of onset of the disease or the following calendar year (Table XXXIII). This may be interpreted as an expression of a lower degree of access and a different attitude to hospital care for psoriasis some decades ago.

Further, a study was made of the number of times the psoriatics in question had been treated in hospital for their skin disease since its onset. The number of occasions of hospitalization was chosen for the following reasons. The alternative was the number of days

in hospital for psoriasis, either during a certain time period or totally since the onset. The number of days in hospital is a better measure of the extent of hospital care consumption than the number of occasions of hospitalization but would seem to offer no advantages in a study of the selection mechanisms.

It seems to be more important to study factors of significance for evaluating the indication for admission than the length of the resulting hospital care. Furthermore, the length of the hospital care may be influenced by factors of minor importance for the problem in hand. One important factor regarding the number of occasions of hospitalization was that when a patient had "leave" from hospital for longer than two days, e.g. at holiday times, he was recorded as being discharged from hospital and then entered as readmitted. For this reason readmissions immediately following holidays such as Christmas, New Year and Easter were not included in the calculation of hospitalization occasions.

The mean numbers of occasions of hospitalization for persons with different durations of psoriasis in the different age groups are given in Table XXXIV. It was found consistently that persons with a longer duration of the disease had been admitted to hospital more frequently than those with a shorter duration. The same applied with respect to the duration of joint symptoms in the psoriatics. This in itself seemed natural, but is nevertheless of interest in the light of Allander's findings (1) for persons with rheumatoid arthritis, namely that the number of occasions of hospitalization did not increase with the du-

TABLE XXXIII. Length of time between onset of psoriasis and first occasion of hospitalization for psoriasis in the different sex and age groups. The figures are given in percent.

Age	Within same or following calendar year	Within 2-4 yrs	Within 5-9 yrs	After more than 10 yrs	Information lacking	Total
<i>Men</i>						
25-29	52	11	7	28	2	100
35-39	0	17	34	41	8	100
45-49	13	2	19	58	8	100
55-59	21	10	6	57	6	100
<i>Women</i>						
25-29	39	23	10	16	12	100
35-39	27	16	5	52	0	100
45-49	18	10	10	57	5	100
55-59	22	7	11	41	19	100

TABLE XXXIV. Mean number of occasions of hospitalization for psoriasis since the onset of the disease related to duration and severity of the course of the psoriasis, in the different sex and age groups.

Age	Mean number of occasions of hospitalization for psoriasis						Total
	Duration of psoriasis		Course of psoriasis				
	≤ 9 yrs	≥ 10 yrs	mild	moderate	severe	very severe	
<i>Men</i>							
25-29	1.5	2.5	1.2	2.0	10.0	5.0	2.4
35-39	2.0	4.0	2.9	1.0	5.3	13.0	4.0
45-49	0	3.1	2.0	3.0	5.4	3.5	2.9
55-59	1.7	4.6	1.4	4.7	15.0	0	8.8
<i>Women</i>							
25-29	1.2	1.7	1.6	1.6	2.0	0	1.7
35-39	0	1.3	1.3	1.2	0	0	1.3
45-49	1.5	1.7	1.7	1.0	2.0	5.0	1.8
55-59	2.0	2.7	1.9	2.7	0	23	2.8

ration of the disease. His results were obtained from a population study, however, and not from a selection of previously hospitalized persons alone.

It can also be seen in Table XXXIV that the number of occasions of hospitalization increased with increasing severity of the course of the psoriasis. This again was natural in

itself, but it deviated from Allander's finding (1) in persons with rheumatoid arthritis that there was no increase in the number of hospitalization occasions with increasing severity of that disease.

The interpretation of the result for the rheumatoid arthritis persons that admission to hospital for that disease was not related

to the severity or duration of the disease, and that this expressed a certain degree of resignation concerning the therapeutic possibilities offered, analogous to the findings for persons with degenerative joint diseases (4), could not be applied to the psoriatics of the present investigation. This difference may be due to a different attitude and greater faith in the therapeutic possibilities among psoriatics than among persons with rheumatic diseases.

What factors are of greatest importance for the selection of hospital-treated psoriatics?

This question was elucidated by a stepwise regression analysis with the number of occasions of hospitalization as the dependent variable. The independent variables were those used for

the nature of the psoriasis (age at onset, duration, severity of the course, subjective complaints from the disease),

joint involvement (occurrence of joint symptoms in general, number of clinically involved joints, severity of peripheral arthritis, functional capacity according to Steinbrocker *et al.*, subjective evaluation of joint complaints),

the socio-medical conditions (civil state: never married, married, divorced, widow/widower; place of residence, school education, degree of gainful employment, social class, income (represented by sickness benefit), and

morbidity (sick days for psoriasis and for other illness, previous and present state of health)

(Appendix IV).

Table XXXV shows the order of sequence of the five independent variables with the strongest relationship for men and women separately. Despite the fact that the women had a considerably milder form of psoriasis, in both men and women the two variables with the strongest relationship to the number

TABLE XXXV. The relative importance of different factors for the number of occasions of hospitalization for psoriasis since the onset of the disease in men and women according to a stepwise regression analysis.

Relative importance of different factors for number of occasions of hospitalization for psoriasis

MEN	WOMEN
1. Severity of course of psoriasis	1. Number of psoriatic sick days
2. Number of psoriatic sick days	2. Severity of course of psoriasis
3. Subjective complaints from psoriasis	3. Widow
4. Degree of gainful employment	4. Arthritis score, peripheral joints
5. Duration of psoriasis	5. Number of non-psoriatic sick days

of occasions of hospitalization were the severity of the course of the disease and the number of psoriatic sick days, though they were in opposite orders of sequence in the two sexes. The other variables were different, however. Subjective complaints from psoriasis were markedly related to the times of hospitalization in the men, but, remarkably enough, not in the women. Obviously in the case of the female psoriatics the subjective complaints were of greater importance for obtaining hospital care on a particular occasion than for the number of times this hospital care was later repeated.

Joint involvement, on the other hand, had a more prominent place in the women than in the men, which may be a result of importance in the evaluation of the arthrites among the studied female psoriatics. In the women the non-psoriatic sick days were also included among the five variables with the strongest relationship to number of hospitalization occasions, which would seem to be connected with the higher general morbidity noted in the women than in the men.

This analysis of factors related to the number of occasions of hospitalization constitutes,

TABLE XXXVI. Summary of results concerning age at onset, duration, course and subjective complaints in psoriasis. Mean values and standard deviations are given.

Age	Age at onset	Duration yrs	Course of psoriasis ^a	Subjective complaints from psoriasis ^a
<i>Men</i>				
25—29	13 ± 5	15 ± 5	1.6 ± 0.9	2.1 ± 1.1
35—39	18 ± 6	19 ± 6	2.2 ± 1.0	2.4 ± 1.0
45—49	23 ± 8	25 ± 8	2.0 ± 0.8	2.3 ± 1.1
55—59	32 ± 12	26 ± 13	1.8 ± 0.6	2.4 ± 1.1
<i>Women</i>				
25—29	13 ± 4	15 ± 5	1.3 ± 0.4	2.0 ± 0.9
35—39	17 ± 8	21 ± 7	1.1 ± 0.3	2.1 ± 1.0
45—49	23 ± 11	25 ± 11	1.3 ± 0.7	2.1 ± 1.0
55—59	29 ± 15	29 ± 15	1.3 ± 0.8	2.2 ± 0.9

^a according to a four-graded scale, Appendix IV

however, only a limited part of the study of the selection mechanisms. In order to study these more thoroughly, and at the same time to shed further light on the problems treated in this investigation, a study of psoriatics randomly selected from a larger population is necessary. Only when such a study has been made can the presented hypothesis on the importance of selection factors for the results obtained in this investigation be supported or confirmed.

B. INTERPRETATION OF THE RESULTS

The aim of this investigation was to study the occurrence of joint involvement and its nature, the socio-medical conditions and the general morbidity in psoriasis. In order to achieve a more differentiated picture of the relationships to the skin disease, certain variables were formulated as expressions of the nature and severity of the disease. For the

purpose of the investigation a group of psoriatics who had been previously treated in hospital (a dermatological ward) for their skin disease were followed up.

The results obtained thus reflect first and foremost the conditions in a material of psoriatics who have at some time been treated for their skin disease in a department of dermatology in a city region. Of great importance is, of course, the question of whether the results may be regarded as valid for other psoriatics also, e.g. those who have been treated in another type of clinic or who have never been treated in hospital for their skin disease.

Some of the results reported in previous chapters are summarized in Table XXXVI.

Age at onset

It is seen that the age at the onset of the disease was the same in both sexes, but differed considerably between persons in different age groups. These differences were especially marked on account of the choice of age groups, which was made particularly to accentuate age differences.

Is this difference in the age at onset between the age groups a true one? If so, this means that the disease started later in persons who were older at the follow-up than in those who were younger. This seems unreasonable, unless a considerable change has taken place in the nature of the disease, a change towards an increasingly early onset during the last decades. This is not supported by earlier observations, where the disease often is reported to have had its onset before the age of 20—30 years. Thus it must be asked whether this difference between the age groups is caused by other factors, in particular the composition of the material, which depended upon its hospital-based character. The pattern concerning the age at onset of the disease cannot therefore be considered representative of that for psoriatics on the whole, and the result cannot be generalized.

Course

The course of the psoriasis was evaluated on a four-graded scale. The men had consistently had a more severe course of the disease than the women. The youngest and oldest men had had milder courses than the men of the intervening ages. Among the women the course was of the same degree of severity at all ages.

Do men have more severe psoriasis than women? Is psoriasis more severe in middle-age than before and later in men but not in women? It would seem quite possible that in many cases the disease will be mild at a young age and will become more severe with time — this period then usually coinciding with middle-age after perhaps 10—20 years' duration — and then again change to a calmer and milder phase. This has never been shown, however, which is due partly to the lack of generally accepted expressions of the degree of severity, and partly to the fact that no longitudinal investigations with the aim of elucidating these aspects have been performed.

The question remains, however, whether men have more severe psoriasis than women. This has not been claimed previously. On the contrary, Lomholt (90) found in his study from the Faroe Islands that women rather had more severe psoriasis than men. It is of course conceivable that the situation in the Faroe Islands is of a special nature, i.e. that genetic factors in this relatively isolated island population have resulted in a characteristic disease pattern that is not necessarily the same in other populations with different genetic features. The results of genetic studies of other populations have not, however, differed appreciably from those in the Faroe study. Further, if there were a true sex difference in the severity of psoriasis, it would seem remarkable that this has not been pointed out earlier in the voluminous literature on the clinical conditions in this disease.

Therefore, for this question also it must be asked whether the observed difference between men and women regarding the severity of the disease was not due chiefly to the composition of the material. The pattern of the degree of severity of the disease cannot therefore be considered representative for psoriatics in general.

Subjective complaints

The subjective evaluation of troubles caused by the psoriasis was a very heterogeneous variable. It was mainly coloured by the situation of the last few years and was regarded as a good complement to the more descriptive course variable, especially in consideration of the completely different evaluation norms involved — in the one case the evaluation of the examiner and in the other that of the psoriatics themselves. This variable showed relatively small differences between the sexes and between the different age groups.

Do women experience psoriasis as more troublesome than do men? The result indicates this, as the women had milder forms of

psoriasis from a purely medical aspect but nevertheless experienced their symptoms to the same degree as the men. It is possible that this also applies generally among psoriatics. This could be one of the reasons that the female proportion of the material was greater than the male, and agrees with the view that experience of disease is of great importance for the consumption of health care (98).

Joint involvement

The joint involvement in psoriasis is somewhat difficult to analyse because of the lack of agreement that still prevails in the nosological classification of arthritis in psoriatics.

The number of affected joints (or joint groups) was somewhat greater in male than in female psoriatics. It was greater in older than in younger psoriatics and in persons with more severe psoriasis than in those with a milder form. This held regardless of whether the joint involvement was considered to be arthritis or not.

Do male psoriatics have more joint complaints than female? Do persons with severe psoriasis have more joint complaints than persons with milder psoriasis? Many authors from various places have drawn attention to the fact that older persons have more joint symptoms than younger persons, and it is improbable that psoriatics differ from other people in this respect. It is possible that persons with a more severe course of psoriasis have greater joint involvement, and this has in fact been pointed out by other authors. Interpretation of the relationship between the male and female psoriatics as regards joint involvement is complicated both by the sex difference in the severity of the psoriasis and by differences in a social respect, reflected, among other things, by social class — it was found that the men in the material were in a lower social class than their controls and the women in a higher class, and thus it could be assumed that a relatively greater number of

the men had had heavy manual work with strain on the joints. The pattern of joint symptoms in psoriasis observed in this investigation cannot therefore be generalized to refer to psoriatics in general.

The functional capacity, seen from a joint aspect and evaluated according to Steinbrocker *et al.*, and the subjective symptoms from the joint involvement showed the same distributions within the material. There was some reduction of the functional capacity and some increase of the subjective joint symptoms with increasing age, but no sex difference. On the whole, however, the reduction of the functional capacity and the subjective symptoms were of a small extent. The results indicate, however, that women experience joint involvement as more troublesome than do men, as the subjective symptoms were about equal among men and women, while women had a milder form of joint involvement. This is not especially characteristic of psoriasis, however.

Peripheral arthritis

Roentgenological erosions in peripheral joints were more common in men than in women, in older than in younger persons and in persons with more severe than with milder psoriasis.

Do male psoriatics have more peripheral arthritic changes than female psoriatics? Do older psoriatics have more peripheral arthritic changes than younger ones? And do persons with severe psoriasis have more peripheral arthritic changes than persons with a milder form of the disease? The results indicate that older psoriatics have more peripheral arthritic changes than younger ones, and that those with severe psoriasis have a greater number than those with milder psoriasis. It is possible that these findings express true relationships. The interpretation is complicated, however, by the fact that in this material the men, on the average, were both older than the women and had more severe psoriasis than they did.

The finding, therefore, that the male psoriatics had more numerous and more severe peripheral arthritic changes than the female may be given the interpretation that persons with more severe psoriasis also have more peripheral arthritic changes, regardless of sex. If women develop arthritis more readily than men (which applies to rheumatoid arthritis and is possible also for psoriatic arthritis), this would mean a strengthening of the relationship between severity of psoriasis and peripheral arthritis. Another interpretation, however, is that male psoriatics develop peripheral arthritis more easily than female, in contrast to the situation reported for rheumatoid arthritis (p. 37). If this were true, the relationship between severity of psoriasis and peripheral arthritis could be illusory. It has been claimed by rheumatologists, further, that persons with severe psoriatic arthritis often have particularly mild skin changes (45, 108). The pattern of peripheral arthritic changes in this material of psoriatics is thus not clear-cut, and cannot be generalized to refer to persons with psoriasis as a whole.

Sacro-iliitis

The roentgenological involvement of the sacro-iliac joints (by erosion) differed from that of the peripheral joints by being the same in both sexes and also in the different age groups, but more frequent in persons with severe than in those with mild psoriasis.

Do female psoriatics have sacro-iliitis as often as male? Do younger psoriatics have sacro-iliitis as often as older ones? Do persons with severe psoriasis have sacro-iliitis more often than persons with milder forms of the disease?

Age does not appear to be decisive for the occurrence of sacro-iliitis. The results suggest, on the other hand, that there is a relationship between sacro-iliitis and the severity of the psoriasis. If this is a true relationship, the finding of the same frequency of sacro-iliitis

among the men and women may be given the interpretation that in reality female psoriatics have sacro-iliitis more frequently than male, in view of the fact that the women in the material had a milder form of psoriasis than the men. Is this really so? The investigation gave no answer to this question.

Socio-medical conditions

There was a considerable age difference between the men and women of this material, which was particularly marked in the light of the mutual relationships between the age groups in question within the population in the region (Fig. 1). It is extremely improbable that this sex and age pattern in the studied material of psoriatics corresponds with the sex and age prevalence of psoriatics in the population and is considered instead to support the view that the material constituted a distorted selection of the population.

Further, it was found that there was an overrepresentation, within the material, of psoriatics resident near to hospitals. There was also some overrepresentation of older persons among those resident near to hospitals (Table XXXVII).

Is psoriasis more common in persons resident in an urban area than in those residing in suburbs and rural areas? If this were really so, several reasons could be discussed. For instance it could offer support for the assumption of the importance of stress for the disease, if not as an aetiological factor, at least as a factor provoking its manifestation. A relationship between the disease and various exogenous factors in the environment could also be brought into the discussion. It is of course quite possible that the pattern as regards place of residence represents a true prevalence pattern. This question can neither be answered positively nor negatively without an investigation of the prevalence pattern in a region such as this. It would seem more reasonable, however, to interpret the results as

TABLE XXXVII. Summary of results concerning area of residence, school education, gainful employment and social class in psoriatics of the different sex and age groups. Mean values and standard deviations are given.

Age	Area of residence ^a	School education ^a	Gainful employment ^a	Social class ^a
<i>Men</i>				
25—29	2.2 ± 0.9	1.6 ± 0.7	2.7 ± 0.7	2.4 ± 0.7
35—39	1.8 ± 0.7	1.5 ± 0.7	2.8 ± 0.6	2.5 ± 0.5
45—49	2.1 ± 0.7	1.5 ± 0.7	2.6 ± 0.8	2.2 ± 0.7
55—59	1.7 ± 0.7	1.3 ± 0.5	2.6 ± 0.8	2.6 ± 0.5
<i>Women</i>				
25—29	1.9 ± 0.7	1.5 ± 0.7	2.2 ± 0.9	2.2 ± 0.4
35—39	1.9 ± 0.9	1.7 ± 0.8	2.2 ± 0.7	1.9 ± 0.6
45—49	1.8 ± 0.6	1.5 ± 0.7	2.5 ± 0.7	2.2 ± 0.5
55—59	1.6 ± 0.6	1.4 ± 0.6	2.1 ± 0.8	2.2 ± 0.6

^a according to a four-graded scale, Appendix IV

an expression of the selection — that for different reasons persons with a long distance to a hospital, especially older persons, have more difficulty in utilizing hospital care than those who live nearer.

The extent of school education showed a minor difference between older and younger persons, a difference that was smaller than expected. No appreciable relationship between psoriasis and school education was found.

The male psoriatics showed a lower degree of gainful employment than their controls, while that of the female psoriatics was higher. The finding of a lower degree of gainful employment among the male psoriatics compared with "healthy" controls was to be expected, but the higher degree of gainful employment in the women, compared with their controls, was surprising.

Do female psoriatics have gainful employment to a greater extent than other women? If so, this may be interpreted in several ways. A higher frequency of women with psoriasis than other women may be single (never married, divorced). It was in fact a consistent finding that a somewhat lower frequency of the psoriatics were married and a somewhat

higher frequency were single, as compared with the controls, though the differences were small and did not correspond to the differences in gainful employment. Further, it is possible that psoriatics may have fewer children than others, and it may therefore be easier for the women to have gainful employment outside the home. In the present study no difference in the number of children was found, however, between the female psoriatics and their controls of the same civil state and same age. It seems improbable, however, that the extent of gainful employment in the female part of the material reflected a true pattern of gainful employment among certain female psoriatics in general. More probable is that the findings expressed a greater need of hospital care for psoriasis among women. If a greater extent of gainful employment was combined with a higher capacity to convert this need to consumption, then this would lead to hospital care for relatively milder forms of the disease.

The same reasoning can be applied to social class. The men were found to belong to a lower and the women to a higher social class than their controls. The same held for income

from gainful employment, as expressed by sickness benefit (Table XXVI), the men having a lower and the women a higher income than their controls.

Morbidity

Finally, with regard to the different factors used to express morbidity, the women were found to have fewer sick days due to psoriasis than the men, corresponding to the considerably milder nature of the disease in the former sex. On the other hand, the women had a somewhat larger number of sick days caused by other illness than psoriasis, compared with the men, and further, in the psoriatics of both sexes the number of sick days due to illnesses other than psoriasis was greater than the total number of sick days of the controls.

Do psoriatics have greater morbidity than other persons? Do female psoriatics have greater morbidity than male psoriatics? Do persons with severe psoriasis have greater morbidity in general than persons with milder psoriasis? Do persons with greater morbidity in general have a more severe form of psoriasis than those with low morbidity in general?

These questions are difficult to answer, partly because the concept of morbidity is not homogeneous and comprises different levels of evaluation, both that of the individual himself and that of the examining physician; further, it is strongly related to factors in the environment of the person concerned, e.g. the nature of his work.

No significant relationship was found between higher morbidity and more severe psoriasis. Female psoriatics reported more symp-

toms than male psoriatics, which in the light of the milder psoriasis in the women would seem to contradict the view that severe psoriasis is more common in persons with a high morbidity from other causes.

The result indicated, however, that the investigated psoriatics had higher morbidity than the controls; this was suggested not only from evaluation of the sick leave but also from the number of reported symptoms. If this is a true result, it may be interpreted as meaning that psoriasis is more common in persons with high morbidity. Neither in this investigation nor in previously reported studies was psoriasis found to be associated with any special disease or disease group, nor to diseases in any special organ or organs. However, certain changes in different organs have been found in psoriasis, which have been related to a variable representing the severity of the skin disease (102, 125).

When evaluating the results of the comparison with controls, due consideration must be taken of the fact that the psoriatics of this study had been previously hospitalized, while the control groups consisted mainly of people who had not been treated in hospital. One possible interpretation of the higher general morbidity of the psoriatics is that persons with a certain disease (in this case psoriasis) will have a greater chance of having hospital care for this disease if they also have other diseases. This was in fact first pointed out by Berkson in 1945 in a study which has received much too little attention by clinicians (20), and has since been confirmed in other studies, including studies in Sweden (47, 84, 85, 94, 95). This means that no conclusions concerning the morbidity of psoriatics in general can be drawn from the morbidity observed in the psoriatics of this investigation.

IX. SUMMARY AND CONCLUSIONS

The purpose of this investigation was to study the possibility of grading the severity of psoriasis, and the occurrence and nature of joint involvement, the socio-medical circumstances and the general morbidity in this disease. In order to accomplish these aims, 408 psoriatics previously treated for their affection on hospital dermatological wards were investigated. Three hundred of them were examined personally.

The control material consisted of subjects from previous health screening projects and from the Swedish State Commission of Inquiry into Low Incomes as well as subjects from the files of the Regional Social Insurance Offices, matched with the psoriatics by sex and age.

Psoriatics and controls were in the 25-29, 35-39, 45-49 or 55-59 year age groups at the respective investigations. They were all living in the Stockholm region.

In order to express the severity of the psoriasis, several variables were used, all of them devised on a four-graded scale: the severity of the course of the psoriasis over the years as evaluated by the examining physician (the author); the psoriatics' own subjective assessments of their complaints from the skin disease during this period; the extent and intensity of the psoriatic lesions at follow-up; the extent according to the percentage involvement of the body surface; and the intensity according to the palpable infiltration.

A number of other variables were used to express joint involvement, socio-medical circumstances, and general morbidity.

MAIN CONCLUSIONS

I. In the psoriatic material studied there was a marked sex difference in the severity of the psoriasis. The men were more severely afflicted than the women when both the severity of the course and the extent and intensity were considered. The subjective complaints from the psoriasis, however, were assessed almost equal in men and women. This meant that the women experienced even mild psoriasis as causing greater discomfort than did the men. This finding is probably a reflection of the preponderance of females in the material.

It must be questioned whether this sex difference in the severity of the psoriasis is representative of psoriatics in general. It is more probably an expression of the differing needs of male and female psoriatics in the question of health care. The subjective assessment of complaints due to the skin disease thus seems to be more closely related to the need and utilization of hospital-based medical treatment than more descriptive medical expressions of the severity of the disease.

II. Arthritis was found both in peripheral and in sacro-iliac joints. Peripheral arthritis was more common in male than in female psoriatics, and more common in subjects with more severe forms of psoriasis than in those with milder forms. The clinical and roentgenological pattern of the peripheral joint involvement in psoriatics with arthritis, and particularly the relatively more frequent involvement of distal phalangeal joints, plus

the lack of detectable rheumatoid factors, as well as the strong relationship between the severity of psoriasis and of joint involvement, were all considered to support the concept of peripheral arthritis in psoriasis as being entirely separate from rheumatoid arthritis, seen from a nosological point of view.

III. Sacro-iliitis was as common in male as in female psoriatics, and equally common in younger and older persons. This was thus in clear contrast to the situation in pelvo-spondylitis (ankylosing spondylitis), which is looked upon as a mainly male syndrome.

In psoriatics with sacro-iliitis, involvement of peripheral joints was found in roughly half of the cases. Most of the psoriatics with peripheral arthritis also had concomitant sacro-iliitis.

In the main, psoriatics with sacro-iliitis had no or only slight and untypical low back symptoms. This is also in sharp contrast to the situation in pelvo-spondylitis, where pain and tenderness are often manifest.

The findings in the psoriatics were considered to lend support to the opinion that sacro-iliitis in psoriasis is nosologically distinct from pelvo-spondylitis.

IV. From a socio-medical point of view, different patterns were seen in male and female psoriatics. The men had had an inferior school education, were less often gainfully employed, belonged to a lower social class, and had lower incomes than their controls. The differences were mostly small, however. The women, on the other hand, had had a longer vocational education, were more often gainfully employed, belonged to a higher social class, and had higher incomes than their controls. The differences were relatively large and were of statistical significance. Nevertheless, the social variables studied could not be convincingly related to the severity of psoriasis or to the subjective complaints from

the skin disease. Thus the interpretation was that factors other than psoriasis *per se* were more significant, especially the varying ability amongst psoriatics to utilize the available medical facilities.

V. A higher degree of morbidity (apart from psoriasis itself) was found in male as well as in female psoriatics in comparison with their controls. This result applied both to sick leave, previous treatment for other diseases, and the number of symptoms reported.

In the psoriatics, the number of sick days due to other diseases was consistently higher than the total due to the psoriasis itself. The total sick leave due to psoriasis was closely related to the severity of the course of the affliction, whereas the number of sick days due to other diseases was not.

On the other hand, neither the number of previous treatments for other diseases nor the number of reported symptoms could be related to the severity of psoriasis. Nor were the treatments or the symptoms reported concentrated to any particular organ.

The interpretation of the greater morbidity in psoriatics found in the present study was that psoriatics were more likely to seek hospital treatment for psoriasis if they had other diseases in addition.

VI. The composition of the present case material of psoriatics has been shown to be of great importance in the process of drawing more broad-based conclusions from the results. In this respect, various selection factors involved in the composition of a hospital material of this type are of vital significance. In order to shed further light on the problems treated in this investigation and to be able to evaluate the importance of various selection factors for the results of the study, an investigation of psoriatics randomly selected from a larger population should be made.

APPENDIX 1. ABBREVIATIONS

DIP	Distal interphalangeal joints	PA	Psoriatic arthritis
HSCC	Health survey Stockholm County controls	PIP	Proximal interphalangeal joints
HSSE	Health survey state employees	RA	Rheumatoid arthritis
ILI	Inquiry into Low Incomes (Swedish State Commission of Inquiry into Incomes of Swedish people)	RA joints	Joints typically affected in rheumatoid arthritis
MCP	Metacarpophalangeal joints	non-RA joints	Joints not typically affected in rheumatoid arthritis
MTP	Metatarsophalangeal joints	RF	Rheumatoid factor
OA	Osteoarthritis	SCAT	Sheep Cell Agglutination Test, Rose Waaler Test

APPENDIX II. THE QUESTIONNAIRE

A. PREVIOUS STATE OF HEALTH

PREVIOUS ILLNESSES

Have you had

- 14 joint pain as a child (rheumatic fever)
- 16 St. Vitus's dance as a child
- 17 coronary thrombosis (infarct)
- 18 angina pectoris
- 21 asthma
- 25 gastric ulcer
- 26 gallstone disease
- 27 kidney stones
- 28 inflammation of the kidneys (nephritis)
- 535 gonorrhoea
- 30 jaundice
- 31 toxic goitre
- 36 hernia of intervertebral disc (lumbago, sciatica)
- 452 cancer
- 33 nervous symptoms
- 980 if you have had any other diseases, name them here

PREVIOUS OPERATIONS

Have you been operated on for

- 41 goitre
- 44 heart disease
- 45 gastric ulcer
- 46 appendicitis
- 47 gallbladder diseases
- 48 kidney diseases
- 49 prostate disease¹
- 52 growth (nodule, cyst) in the uterus or ovaries (not cancer)²
- 542 growth (nodule, cyst) in the breast (not cancer)²
- 53 cancer of the uterus or ovaries²
- 54 cancer of the breast²
- 981 if you have been operated on for any other ailments name them here

¹ to be answered only by men

² to be answered only by women

PREVIOUS STAYS IN HOSPITAL

Have you been in hospital for

- 604 bodily injury after accident
- 603 organic nervous or muscle disease
- 543 mental disease
- 545 eye disease
- 59 ear disease
- 60 disease of nose or throat
- 61 lung disease
- 62 heart disease
- 546 gastric ulcer
- 63 disease of the digestive tract other than gastric ulcer
- 547 gallbladder or liver disease
- 548 kidney disease
- 455 urinary tract infection
- 454 prostate disease¹
- 393 urogenital disease²
- 982 any other ailments; if so, name them here

PREVIOUS TREATMENT BY A DOCTOR (which has not meant a stay in hospital)

Have you been treated by a doctor for

- 605 organic nervous or muscle disease
- 69 disease of the brain
- 70 eye disease
- 71 ear disease
- 72 disease of nose or throat
- 73 lung disease
- 74 heart disease
- 75 disease of digestive tract
- 77 gallbladder or liver disease
- 78 kidney disease
- 607 rheumatic symptoms
- 606 nervous symptoms
- 549 urinary tract infection
- 76 venereal disease
- 396 urogenital disease²
- 79 have you proved allergic to drugs, i.e. have you ever had a rash, itching, fever, swollen face, swollen hands etc. after taking medicine?
- 983 if you have been treated by a doctor for any other ailments, name them here

B. PRESENT STATE OF HEALTH

PRESENT STATE OF HEALTH, GENERAL

Have you got

- 2 diabetes
- 3 rheumatic joint symptoms
- 4 high blood pressure
- 5 angina pectoris
- 6 lung disease
- 7 disease of the digestive tract
- 8 gallbladder or liver disease
- 9 kidney disease
- 10 cancer
- 19 if you are being treated for any other ailment, name it here

MEDICINES

Are you taking

- 20 medicines to lower your blood pressure; if so, which
- 21 diuretics (medicines to help you lose water); if so, which
- 22 digitalis in any form
- 23 laxatives
- 24 pain-relieving drugs
- 25 medicine to lose weight
- 26 tranquillizers
- 27 sleeping pills
- 28 insulin
- 29 AP tablets
- 30 cortisone (tablets or injections)
- 31 regular contraceptive pills (P-pills)
- 39 if you take medicines regularly or often, state which

PRESENT SYMPTOMS

- 40 do you often have headaches
- 41 are the headaches usually in the forehead
- 42 are the headaches usually on both sides of the head
- 43 are the headaches very severe
- 44 are the headaches usually accompanied by nausea or vomiting
- 45 do you usually see spots or flickering lights before the headaches start
- 46 do you take headache tablets daily or almost daily
- 47 have you ever had a severe blow on the head
- 48 if so, do you still have symptoms from it
- 49 if you have any other head or facial symptoms, name them here
- 50 has your sight deteriorated rapidly on one side
- 51 have you had to change to stronger glasses several times recently
- 52 have you ever seen double
- 53 is your vision often blurred
- 54 do you become dizzy or does it become black in front of your eyes when you stand up
- 55 does one or both of your eyelids hang down
- 56 do you have pain or aching in one eye
- 59 if you have any other eye troubles, name them here
- 60 do you ever have a troublesome burning sensation on the tongue
- 61 do you ever have difficulty in chewing or swallowing when you have been eating for a time

- 62 do you have difficulty in swallowing your food
- 63 have you had heartburn recently
- 64 are your gums swollen
- 65 is your mouth very dry
- 66 have your salivary glands been swollen for a few days
- 67 do you have pain in the jaw joint
- 69 if you have any other ailments of the mouth or throat, state them here

Do you get discomfort or pain in the chest

- 70 on exertion
- 71 if you get excited
- 72 when it is cold
- 73 when walking uphill or up steps
- 74 when resting

when you have discomfort or pain in the chest

- 75 does it disappear if you exert yourself
- 76 does it disappear if you rest
- 77 does it become worse if you breathe deeply
- 78 does it become worse if you rest

when you have discomfort or pain in the chest

- 80 does it radiate into the left arm
- 81 does it radiate up to the neck
- 82 does it radiate out to the back
- 83 does it radiate out to the fingers
- 84 have you noticed that you are more short of breath now than before when you walk uphill or up steps
- 85 have you noticed that you are more short of breath even when you are resting
- 86 do you have attacks of heart palpitation when the heart seems to be beating twice as fast as usual
- 87 does the heart palpitation start and stop abruptly
- 88 do you cough up reddish slime
- 89 is there a wheezing or whistling sound in your chest when you breathe
- 90 do you sometimes have to sit up in bed at night because of cough or shortness of breath
- 100 has one or both hands become weak or clumsy
- 101 do you often have tingling or numbness of the toes
- 102 do you have difficulty in walking steadily in the dark
- 103 do you have pain in the arms
- 104 do you have pain in the legs
- 105 do you have pain in the legs when out walking
- 106 do you have cramp-like pain in one or both calves when you have walked for a short distance, so that you have to stop and rest a while
- 107 does the pain in the legs disappear if you stop
- 108 have your arms become weak
- 109 do you have swelling of the lower legs, ankles or feet in the evening
- 110 do you get cold feet now more easily than before
- 119 if you have any other ailments of the arms or legs, state them here
- 120 have you had aching or pain around both sides of the abdomen
- 121 do you have pain in the pit of the stomach mostly in the autumn and spring
- 122 do you have such pain mostly when you are hungry, and does it become better if you eat a little
- 123 do you have continuous pain in the stomach
- 124 does such pain occur after meals

125 do you have attacks of stomach pain accompanied by sweating, anxiety or feeling of panic (especially after meals)

126 do you have pain on the right side of the abdomen, just under the right lower rib

127 have you had severe pain (attacks) in the right upper part of the abdomen

128 have you had abdominal pain radiating out into the back and up to the right shoulder-blade

129 have you often had a sharp pain in the stomach recently, and always in the same place

130 have your stools always been rather loose

131 are your stools different from what they used to be

132 have your previously normal stools become hard

133 do you have loose or watery stools a few times daily

134 have your stools become pale and greyish white, like clay

135 are your stools loose and bubbly as if they were fermenting

136 is the desire to go to the toilet often sudden and uncontrollable

137 have you noticed any worms in your stools

139 if you have any other stomach or intestinal complaints, state them here

140 is your urine sometimes reddish

141 do you often have cystitis

142 do you have to pass urine often, say once an hour

143 do you have get up several times at night to pass urine

144 have you recently had sexual intercourse with anybody who might have had venereal disease

145 when urinating, do you find it difficult to start the stream

146 is the stream thin and weak

149 if you have any other complaints from the urinary or genital organs, state them here

150 do you have foul-smelling discharge from the vagina²

151 do you have any reddish discharge from the vagina between menstrual periods²

152 do you have any bleeding from the vagina during or immediately after sexual intercourse²

153 does anything protrude through the vagina during exertion²

154 if you have had children, have you ever had convulsions during delivery²

160 are you troubled by giddiness

161 do you have attacks of giddiness when everything spins round

162 have you had any fits

163 do you have any tingling or numbness on one side of the body, which disappears after about a minute

164 do you have difficulty in talking because your speech is slurred

165 have you started to sweat at nights

166 are you more thirsty than you used to be

167 do you feel the cold much more than you used to do

C. PSORIASIS

1 how old were you when your psoriasis started: age in years

did the outbreak of psoriasis start on the

2 elbows, knees

3 arms, legs (except elbows, knees)

4 trunk, chest, back

5 scalp

6 on or around the genital organs

7 hands, feet (except nails)

8 nails

9 extensive eruptions over large parts of the body

did the psoriasis start

10 as small lesions (smaller than a 10 öre piece)

11 as lesions the size of a larger coin

12 as large confluent patches

were the lesions at first

13 single

14 moderate in number

15 numerous

has yours psoriasis occurred

16 only once

17 with mild lesions at times and none in between

18 with severe lesions at times and none in between

19 with more or less continuous mild lesions

20 with more or less continuous severe lesions

have you had an outbreak of psoriasis

on the elbows

21 more or less continuously

22 sometimes

on the knees

23 more or less continuously

24 sometimes

on the arms (except the elbows)

25 more or less continuously

26 sometimes

on the legs (except the knees)

27 more or less continuously

28 sometimes

on the hands (except the nails)

29 more or less continuously

30 sometimes

on the nails

31 more or less continuously

32 sometimes

on the feet (except the nails)

33 more or less continuously

34 sometimes

in the scalp

35 more or less continuously

36 sometimes

on the face

37 more or less continuously

38 sometimes

on the chest, back

39 more or less continuously

40 sometimes

in the navel

41 more or less continuously

42 sometimes

on the rest of the abdomen

43 more or less continuously

44 sometimes

in the small of the back, the buttocks

45 more or less continuously

46 sometimes

in the groins

47 more or less continuously

48 sometimes

on the genital organs

- 49 more or less continuously
 50 sometimes
 under the breasts (women)
 51 more or less continuously
 52 sometimes
 in the armpits
 53 more or less continuously
 54 sometimes
- have you had blisters (pustules)
 55 on the palms of the hands
 56 on the soles of the feet
 57 on the body
- when your psoriasis was at its MOST EXTENSIVE,
 what areas were affected at that time
 58 arms
 59 palms of hands
 60 legs
 61 soles of feet
 62 scalp
 63 face
 64 chest
 65 back
 66 abdomen
 67 small of back, buttocks
 68 groins, genital organs
- what were the lesions like then
 69 small (smaller than a 10 öre piece)
 70 the size of a larger coin
 71 large, confluent patches
 72 covering the larger part of the body (erythro-
 derma)
 73 have you had such extensive psoriasis on several
 occasions
 74 if so, about how many times
- do you usually have the eruptions
 75 mostly on the right side
 76 mostly on the left side
 77 almost symmetrically (the same on both sides)
- since your psoriasis started, have you been COMPLET-
 ELY FREE from eruptions
 78 at any time
 79 if so, how long was the longest time you were
 free from eruptions
- are you FREE from eruptions
 80 at the moment
 81 if so, how long have you been free
 82 if you have eruptions at the moment, how long is
 it since you were free from eruptions
- do you think that during the years your psoriasis
 86 has become worse
 87 has become less severe
 88 has remained about the same the whole time
- do you think that during the years the periods when
 you are FREE from psoriasis
 89 have become longer
 90 have become shorter
 91 have remained about the same
- do you think that during the years the periods when
 you HAVE psoriasis
 92 have become longer
 93 have become shorter
 94 have remained about the same
- do you think that your psoriasis is better during the
 95 winter
- 96 spring
 97 summer
 98 autumn
- do you think that your psoriasis is worse during the
 99 winter
 100 spring
 101 summer
 102 autumn
 103 have you noticed anything particular that makes
 your psoriasis worse
 104 e.g. infections
 105 mental stress, shock
 106 anything else, and if so, what
- 107 do you have itching when you have psoriatic
 eruptions
 108 do you have itching even when you are free
 from eruptions
 109 do you have itching sometimes when you have
 psoriatic eruptions
 110 do you have itching more or less constantly when
 you have eruptions
- is the itching usually worst
 111 when the eruptions break out
 112 when the eruptions are healing
- is the itching usually
 113 slight
 114 rather troublesome
 115 very severe
- is the itching usually worst during
 116 the day
 117 the evening
 118 the night
- 142 have you / have you had trouble with your
 joints
- in which joint/joints did the trouble begin
 143 outer joints of the fingers
 144 middle joints of the fingers
 145 knuckle joints
 146 wrists
 147 elbows, shoulders
 148 toe joints
 149 foot joints
 150 knees, hips
 151 lower part of spine
 152 rest of spine, neck
- how did the joint troubles start
 153 stiffness in the mornings
 154 tenderness over the joint
 155 fleeting pains in the joint
 156 constant pain in the joint
 157 pain on movement
 158 swelling of the joint
 159 did the eruption of psoriasis start first
 160 did the joint troubles start first
 161 did the psoriasis and the joint troubles start at
 about the same time
 162 if the psoriasis started before the joint troubles,
 approximately how long before
 163 if the joint troubles started before the psoriasis,
 approximately how long before
- have you since had trouble in the
 164 finger joints
 165 wrists

- 166 elbows, shoulders
- 167 toe joints
- 168 foot joints
- 169 knee joints, hips
- 170 lower part of spine
- 171 rest of spine, neck

- what symptoms have you had in the joints
- 172 stiffness in the mornings
- 173 tenderness over the joint
- 174 fleeting pains in the joint
- 175 constant pain in the joint
- 176 pain on movement
- 177 swelling of the joint
- 178 deformity of the joint
- 179 do the joint symptoms get worse if the psoriasis becomes worse
- 180 do the joint symptoms get better if the psoriasis improves

D. SOCIAL CONDITIONS

- 6 do you have any brothers or sisters
- 7 are you unmarried
- 8 are you married
- 9 are you cohabiting with a partner without being married
- 10 are you separated
- 11 have you been married previously
- 12 are you divorced
- 13 are you a widow/widower
- 14 are you related to your husband/wife
- 15 your husband's/wife's name:
date of birth: yr mth day
- 16 have you any children
- 17 if so, how many

- has there been any psoriasis in your
- 18 father
- 19 mother
- 20 brothers or sisters
- 21 husband/wife or the person with whom you are cohabiting
- 22 your own children
- 26 do you consider that your psoriasis has been a hindrance to a planned marriage
- 27 if you have been divorced, do you consider that your psoriasis has played a part in this divorce
- 33 are you without a place to five
- 34 do you live in a rented flat
- 35 do you live in your own flat
- 36 do you live in a house
- 37 are you living as a boarder
- 38 are you living in a collective home (e.g. batchelors' hotel, student hostel, etc.)
state which:

- does your home have
- 40 hot and cold water
- 39 only cold water
- 41 drainage system
- 42 central heating
- 43 wc
- 44 bath or shower
- 45 do you have access to a washing machine

- does your home consist of
- 46 1 room
- 47 1 room and kitchen (kitchenette)
- 48 2 rooms and kitchen
- 49 3 or more rooms and kitchen
- 52 is there a lift to your flat
- 53 do you live alone
- 54 if not, state the number of persons living in your flat/house:
- 60 have you had a medical certificate stating that you need a better place to live in (e.g. for the local housing authority)
- 61 if so, was this on account of psoriasis
- 62 if not psoriasis, state which disease
- 63 have you a final certificate from elementary school (grundskola) or equivalent
- 64 have you a final certificate from vocational training school (fackskola) or equivalent
- 65 do you lack a final certificate from elementary school or equivalent
- 66 have you completed training at a vocational school (yrkesskola)
- 67 have you a final certificate from gymnasium
- 68 have you a final certificate from a junior secondary school (realskola, flickskola)
- 69 have you undergone vocational training
- 70 state for what vocation/vocations:
- 71 have you undergone vocational training for a total of more than 2 years/less than 2 years
- 72 are you gainfully employed
- 73 state the nature of the employment (title and description of work as detailed as possible)
- 74 do you study (full-time or part-time)
- 75 are you gainfully employed full-time (more than 35 hours per week)
- 76 are you gainfully employed part-time or half-time (less than 35 hours per week)
- 77 are you self-employed
- 78 what education does your husband/wife have:
- 79 is your husband wife gainfully employed
- 80 at what work (as detailed as possible)

- has your psoriasis influenced your choice of:
- 81 education
- 82 vocation
- 83 present work
can you describe in what way:
- 84 do you think that your psoriasis affects your present work (e.g. poorer possibilities of work because of the scaling if one is a cook)
can you describe in what way
- 85 do you think that your work affects your psoriasis (e.g. worsening from dirty work)
can you describe in what way
- 86 how long have you had your present work
- 87 how many jobs (employers) have you had in the last 12 months
- 88 have you had to change your work mainly on account of psoriasis since you started gainful employment
- 89 if so, how many times:
- has your change of work led to
- 90 an improvement of your psoriasis
- 91 worsening of your psoriasis
- 92 better working conditions
- 93 poorer working conditions
- 94 a longer distance to work
- 95 a worse financial situation

APPENDIX III. DIVISION INTO SOCIAL CLASSES

SOCIAL CLASS I

Landowners and tenants of large farms
 Proprietors and managers of large businesses and industries, wholesale dealers
 High officials in private and public service
 Free occupations I
 Property owners etc.
 Others I (including university students)
 Pensioners (with previous social class I occupation)
 Housewives (husbands with social class I occupation)

SOCIAL CLASS II

Farmer etc. (25 acres)
 Tenant farmers and farm managers
 Craftsmen
 Sons and sons-in-law of farmers, living at home
 Small business proprietors
 Foremen (private service)
 Clerical workers
 Sales workers etc.
 Officials of lower grade II (public service)

Sea captains etc.
 Higher domestic service
 Free occupations
 Other business men
 Others II (including pupils at gymnasia)
 Pensioners (with previous social class II occupation)
 Housewives (husbands with social class II occupation)

SOCIAL CLASS III

(Farm) foremen etc.
 Smallholders etc.
 Other farm workers
 Seamen etc.
 Fishermen
 Forestry workers and timber floaters
 Industrial workers
 Officials and workers in public service
 Lower domestic service
 Others III
 Pensioners (with previous social class III occupation)
 Pensioners (not placeable in a social class)
 Housewives (husbands with social class III occupation)

APPENDIX IV. NUMERICAL VALUES OF VARIABLES IN THE STATISTICAL ANALYSIS

Severity of course of psoriasis	1. mild 2. moderate 3. severe 4. very severe	Civil state	unmarried married divorced widow/widower	1. no 1. no 1. no 1. no	2. yes 2. yes 2. yes 2. yes
Subjective complaints from psoriasis	1. none or slight 2. moderate 3. great 4. very great	Area of residence		1. inner city (Stockholm) 2. outer city 3. suburban zone 4. rest of county	
Extent of psoriatic eruption	1. — 5 % 2. 5—30 % 3. 30—75 % 4. 75— %	School education		1. elementary school (lower level) 2. lower secondary school (middle level) 3. gymnasium (higher level)	
Intensity of psoriatic eruptions	1. minimal (doubtful) 2. mild 3. moderate 4. severe	Vocational training		1. none 2. less than 2 years 3. more than 2 years	
Joint symptoms in general	1. no 2. yes	Gainful employment		1. none 2. half-time, part- -time 3. full-time	
Functional joint capacity according to Steinbrocker <i>et al.</i>	1. complete 2. adequate 3. reduced 4. incapacity	Social class		1. social class I 2. II 3. III	
Subjective complaints from joint symptoms	1. none or slight 2. moderate 3. great 4. very great				

APPENDIX V. NON-PARTICIPATION ANALYSIS

Importance of non-participation

The importance of non-participation for the significance of the results of an investigation may be illustrated by the following example.

The observed occurrence of a phenomenon, e.g. severe course of psoriasis (grade 3+4) among the men in the participant group was 18 % (p 29), i.e.

$$p = \frac{\text{number of observed cases of grade (3+4)}}{\text{number of cases in participant group}} = 18 \%$$

The hypothetical extremes can be calculated, either that no-one in the non-participant group had a severity of 3 or 4, thus the minimal estimate

$$p_{\min} = \frac{\text{number of observed cases of grade (3+4)}}{\text{number of cases in whole material}} = 13 \%$$

or that all persons in the non-participant group had a severity of 3 or 4, thus the maximal estimate

$$p_{\max} = \frac{\text{number of observed cases of grade (3+4)} + \text{of cases in non-participant group}}{\text{number of cases in whole material}} = 40 \%$$

Usually it is estimated hypothetically that the distributions of studied variables in the participant and non-participant groups are the same. This is probably seldom correct, however, as the non-participation usually has a tendency, sometimes a strong tendency, to distort the results. The non-participation usually takes place selectively, i.e. it consists largely of elements for which the observations, if they could have been made, would either have lain markedly above or markedly below the mean value.

By evaluating the available information, in this case mainly through file data, or by random tests of the non-participation, estimates can partly be made, however, for variables that cannot thus be observed.

Extent of non-participation

The non-participation took place in two steps, a first step comprising dead (27 in number) and emigrated (10 in number) persons, and a second step, the actual non-participation, i.e. those persons of the available material — alive and resident in Sweden — who did not participate in the follow-up investigation (79 persons: 46 men and 33 women).

The age and sex distributions of these 79 persons are presented in Table I. The non-participation was greatest among older persons, and was greater in men than in women.

Half of them, 40 persons (22 men and 18 women), definitely refused the request that they take part in the follow-up, even after an attempt to persuade them, while the rest, 39 persons (24 men and 15 women), did not answer at all or could not be reached.

Psoriasis

For both sexes the age at onset of the psoriasis was the same in those who took part in the follow-up (the participant group) as in those who did not (the non-participant group).

By the fact that there were more older persons among the men in the non-participant group, the average duration of the disease was relatively somewhat longer in men of the non-participant group than in men of the participant group, but was the same in the women of the two groups.

The severity of the psoriasis in the non-participant group could not be evaluated. In many cases the last occasion of hospitalization was much too long ago (10 years or more in 26 % of the men and 48 % of the women) for the case records from these occasions to give adequate information.

For the same reason the occurrence of joint symptoms, especially of arthritis, could not be evaluated either, and furthermore the information given in the case records was often much too vague to be used as the basis of an evaluation. At least three men and one woman had pronounced joint symptoms, however, denoted as psoriatic arthritis in the discharge diagnosis.

Socio-medical conditions

Information of the civil state was obtained from the files of the Regional Social Insurance Offices, though these were sometimes incomplete, and from care records from previous occasions of hospitalization. Changes of the civil state during the last years preceding the follow-up could not be evaluated with certainty, however. For the men it was estimated that there were more single persons (never married, divorced) and fewer married persons in the non-participant group than in the participant group, while for the women it was estimated that there were more married persons and fewer single persons in the former group (Table XXXVIII, cf. Table XXV).

The area of residence at the times of hospitalization was studied on the basis of the classification into zones (p. 71). For the non-participant group the ratio of residence in the four zones was 1:0.75:0.75:0.38, with no sex difference. There was thus no difference as regards place of residence and the distance to a hospital between those who later participated in the follow-up and those who did not.

At the time of the follow-up two men and five women of the non-participant group were resident in another county, compared with six men and ten women in the participant group.

The education could not be evaluated, either school education or vocational training.

The extent of gainful employment was evaluated on the basis of sickness benefit class and information on disability pensioning. In the men it was the same in the non-participant groups, but in the women it was considerably lower in the former group (Table XXXIX). This was especially true for the youngest women; in the non-participant group only 42 % of these had any degree of gainful employment, as against 64 % in the participant group (cf. Table XXV).

The social classification was estimated from available information on occupation in the registers of the Regional Social Insurance Offices. This was possible for the men but not for the women, as no information had been recorded concerning their husband's occupations. There was no difference in social class between the men in the non-participant and participant groups.

TABLE XXXVIII. Civil state in the non-participant group. The figures are given in percent.

	n	Never married	Married	Widow/ widower	Divorced
Men	46	35	39	2	19
Women	33	9	85	0	6

TABLE XXXIX. Gainful employment, disability pension and social class in the non-participant group. The figures are given in percent.

	Gainful employment	Disability pension	Social class		
			I	II	III
Men	81	19	2	39	57
Women	48	9			

TABLE XL. Mean number of occasions of hospitalization for psoriasis since the onset of the disease in the non-participant group and the participant group.

Age	Mean number of occasions of hospitalization for psoriasis			
	Men		Women	
	Non-participant group	Participant group	Non-participant group	Participant group
25—29	2.0	2.4	2.1	1.7
35—39	3.0	4.0	1.5	1.3
45—49	3.2	2.9	4.0	1.8
55—59	2.5	8.8	1.3	2.8

The income from gainful employment was estimated from the sickness benefit. The men in the non-participant group had, on the average, somewhat lower sickness benefit than the men in the participant group, both in 1965 and in 1970 (non-significant). Compared with their matched controls the men in the non-participant group had somewhat lower sickness benefit in 1965 and significantly lower sickness benefit in 1970, which corresponded with the findings for the men in the participant group. As regards the women, there were no differences between the non-participant and participant groups.

Disability pensioning was somewhat more frequent in both men and women of the non-participant group (19 % and 9 %, respectively) than in the participant group (12 % and 3 %). In the men, the main reasons for disability pensioning, according to the medical certificates, were psoriasis and arthritis combined with depression in one case, hemiplegia in two cases

and mental disorders (pathological personality types, chronic alcoholism with mental disturbances) in the other six cases, and in the women mental disorders in all three cases.

Morbidity

The morbidity was evaluated from the number of sick days (actually the number of sickness benefit days) in 1965-1969. As regards psoriatic sick days, both the men (non-significant) and the women (almost significant) of the non-participant group had a larger number than those in the participant group. Concerning non-psoriatic sick days, on the other hand, the men of the non-participant group had a considerably larger number (highly significant) and the women of that group a somewhat larger number (non-significant) than those of the participant group.

There was no possibility of evaluating the morbidity in the form of previous or present state of health, in the same way as for the participant group. The higher frequency of disability pensioning, however, especially among the men, supported the assumption of a higher general morbidity in the non-participant group, at least in the men, than in the participant group.

The number of occasions of hospitalization in the men of the non-participant group was smaller, however (especially among the older persons), but in the women the same (among the younger women slightly larger) than in the participant group (Table XL).

Importance of non-participation for the results

For the men, it was estimated that the distribution of the severity of the course of the psoriasis was not appreciably affected by the non-participation as judged by the available data on sick leave and times of hospitalization for psoriasis. For the women it was estimated that the course of the psoriasis was somewhat more severe in the non-participant than in the participant group, which might have altered the distribution among the women to some extent.

It was estimated that for the men the social situation was affected to a minor extent by the non-participation, with respect to degree of gainful employment and social class. In view of the higher frequency of single persons and the somewhat lower income, however, it was considered that the housing standard might have been somewhat lower in the non-participant group. For the women it was estimated that inclusion of the non-participant group might have caused a decrease of the remarkably high degree of gainful employment by an increase of the frequency of housewives. The influence of the non-participation on the social classification of the women was difficult to evaluate because of the large number of housewives, whose social class depended upon the class of their husbands, but as the average sickness benefit lay on the same level as in the participant group, the gainfully employed women in the non-participant group must have had a relatively higher income from their own work than the women in the participant group, which could suggest a relatively high social class.

The higher non-psoriatic morbidity, especially among the men in the non-participant group, accentuated the high general morbidity in the psoriatics which was already clearly apparent in the participant group.

From the results of this analysis it was thus concluded that the non-participation, though relatively large, did not appreciably alter the results of the investigation.

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