criticised because it may change prescribing habits. The latest one to appear is the Prescription Event Monitoring scheme, which has been devised and will be run by the Drug Surveillance Research Unit, an independent, non-governmental, non-regulatory body that is part of the faculty of medicine in Southampton. Its director is Dr W H N Inman, who when he worked with the Committee on Safety of Medicines helped to devise the yellow-card system.

Prescription Event Monitoring, for which money is already available, will work in three phases and will start as soon as possible. In the first phase copies of prescriptions for the new drug being studied and a control drug will be obtained from the Prescription Pricing Authority (PPA), which deals with some 300 million prescriptions a year. In the second phase several months later simple questionnaires will be sent to doctors who have prescribed the drugs and they will be asked to record any new events (that is, any new diagnosis, unexpected deterioration, accident, or new symptoms) that have happened to the patient since starting to take the drugs. No fee will be paid, and as no medical opinion will be wanted it is possible that a non-medical person could fill in the form. In the third phase all events associated with the drug being studied

and with the control drug will be analysed; events that are linked with the drug will be investigated further.

The unit will decide for itself which drugs to study, and at first will be testing the scheme as much as the drugs chosen. These will be single-agent drugs that are prescribed medium to long term in sufficient quantities for about 10 000 patients to be collected in one year. Prescription habits will not be altered; collaboration will be voluntary; confidentiality is guaranteed (Dr Inman points out proudly that in 16 years of the yellow-card system with 30 000 doctors submitting 90 000 reports there was not one breach of confidentiality); and the scheme should not be expensive. Adverse reactions that occur with an incidence of about one in a 1000 should be detected, but, as Dr Inman emphasises, the yellow-card system must continue: using any different system to detect very rare adverse reactions would be prohibitively expensive.

Dr Inman thinks that this scheme would have been able to detect early the adverse reactions of practolol, but it must be remembered that the scheme's advantages are as yet theoretical. Indeed, no serious adverse reactions have yet been detected by any of these schemes, and it will be an interesting day when that happens.

Regular Review

Psoriasis and its treatment

R H CHAMPION

To the unthoughtful, psoriasis might seem to be a harmless enough condition of little but cosmetic importance and requiring only simple reassurance and advice that it is a fluctuating disease which cannot be cured and must therefore be lived with. All that is partly true; but the distressing symptoms and the huge numbers of patients regularly attending for treatment (costing \$250 million per year in the United States¹) testify that such a negative attitude is misplaced. Large research interests¹ and budgets ensure a continuous stream of publications, yearly providing more and more information but still no definitive answers. Two international conferences^{2,3} on psoriasis have been held at Stanford with another due later this year.

The cosmetic problem is indeed of great importance—and has been from time immemorial. Despite the emphasis in much undergraduate teaching that lack of itching is a simple way to distinguish psoriasis from eczema, psoriasis does frequently itch and causes other symptoms. Severe psoriasis may be a socially crippling, even life-threatening disorder.

This article will not attempt to review the well-known and varied clinical features of the disease⁴⁻⁷ but will discuss some of the new work on the complex aetiology and in particular the now numerous treatments for more severe cases.

Aetiology—Central to an understanding of psoriasis and its treatment is the too rapid turnover of cells in the epidermis, particularly in the lesions but to some extent also in the

clinically normal skin of psoriatics. The approximation that epidermal turnover is normally about 25 days, reduced to two to five days in psoriasis, has had to be modified^{8,9} by the uncertainties about how much the increased turnover is due to frequent mitosis in the dividing basal cells and how much to recruitment of epidermal cells that would normally be resting rather than dividing.

But what is the cause of this rapid turnover? A genetic factor, with HLA associations, is undisputed.^{4,10} The underlying chemical changes have been eagerly sought and very many candidates have been found. So many of them, however, are the result of the rapid epidermal turnover and not its cause.^{4,11} Changes in cyclic adenosine monophosphate and cyclic guanosine monophosphate have claimed attention for many years; more recently there has been interest in polyamines such as putrescine and spermidine.^{12,13} Migration of polymorphs into the skin is a cardinal feature of psoriasis, and changes in chemotaxis are demonstrable, both due to substances in the epidermis which attract polymorphs and to changes in the leucocytes themselves, notably in basophils.¹⁴⁻¹⁶ This is one of several findings which takes psoriasis away from being a purely cutaneous disorder into the realms of a systemic disease.^{17,18} Immunological changes may also be shown, but again which of these underlie the pathogenesis and which are secondary remains uncertain.^{4,18-20} Of both theoretical and practical interest is the ability of such drugs

as antimalarials and lithium^{21 22} to exacerbate psoriasis, as are also the eruptions clinically rather resembling psoriasis which are provoked by beta-blockers, notably practolol.

On the credit side, perhaps, for psoriatics is the suggestion, still only tentative, that one reason for the persistence of the psoriatic gene in the population is that those affected have a lower than normal incidence of cancer—with a possible mechanism available, reduced aryl hydrocarbon hydroxylase activity.²³ In addition to all these clues to the basic mechanisms are trigger factors—trauma and infections, seasonal changes, hormonal changes, and the vexed and hard-to-quantify influence of emotional stress.²⁴

From the point of view of management psoriasis is best seen as being due to a too rapid turnover in the epidermis, genetically determined but triggered by factors known and more often unknown. Treatment is aimed at reducing that rapid turnover.

The momentum of psoriasis—The severity and clinical course of psoriasis are enormously variable, from occasional insignificant scaling on the knees to a continual life-ruining generalised cutaneous disorder.²⁵ In a large series Farber and Nall²⁶ found that only about 40% of patients had achieved complete remissions over several years.

Planning long-term treatment for any individual must be based on an assessment of how the disease is likely to behave with or without treatment. A useful, if naive, analogy for psoriatic skin is a car. Psoriatic patients are born with potentially fast and unruly cars whose engines are not necessarily running all the time. When the engine is running fast the psoriasis will be active unless the brakes are applied. Persistence of the eruption does not, however, necessarily mean that the engine is still running fast. The car may be kept going for a long time by its own momentum. In clinical terms this means that any treatment which powerfully and temporarily slows down the epidermis may be followed by prompt relapse when the treatment is stopped; or it may be followed by a prolonged remission—until the engine starts up again. Some patients therefore need long-term maintenance treatment; in others intermittent courses of more intensive therapy may be more appropriate.

General measures—Even with the advent of more powerful topical and systemic treatments general measures remain important: adequate explanation, where possible avoidance of stress and fatigue, rest for severely inflamed eruptions, and the advantages of a good holiday. The benefits of joining the Psoriasis Association, of group therapy, of tranquillisers, and of other supportive measures vary with individual temperaments. Dietary advice has virtually nothing to offer, except in the obese. (The Psoriasis Association: 7 Milton Street, Northampton NN2 7JG.)

Topical treatment—For most patients topical treatment is the most logical and safe way to slow down the overactive epidermis without slowing down other tissues. Unfortunately, the more effective remedies may be messy, but even simple measures like petroleum jelly may be of some help. There is also a general misguided feeling among patients, less prevalent in Britain than in some countries, that topical remedies are less effective than oral, which are less effective than injections or enemas.

Topical corticosteroids²⁷ are prescribed—and overprescribed—for psoriasis in enormous quantities. Stronger steroids are obviously more effective but more likely to produce atrophy and systemic absorption. They may sometimes have a more subtle long-term deleterious effect on the course of the psoriasis, making these drugs less valuable in the very long-

term management of psoriasis of any considerable extent. They are, nevertheless, useful especially in the management of psoriasis which is inflamed or has mixed features of eczema; in flexural psoriasis, when even more watch must be kept for atrophy; and for localised psoriasis on the scalp, face, and perhaps hands.

Occasionally a short course of a topical steroid will clear psoriasis and not be followed by a relapse; but such remissions seem more ephemeral than those induced by other means.

Hydrocortisone, though virtually harmless, is virtually inactive in psoriasis. Now that very strong topical steroids have become available polyethylene occlusion is much less often used to increase absorption.

Tar remains an empirical treatment, though it does have a demonstrable antimetabolic effect. Attempts to purify out the active ingredients have been unsuccessful. Numerous preparations are available with varying degrees of elegance, cost, and efficacy. Tar is useful for mild or average psoriasis and is one of the main ingredients of the Goeckerman regimen of intensive, usually inpatient treatment.^{28 29}

Dithranol is perhaps the most effective topical remedy available, but its tendency to cause staining of clothes and skin and to cause inflammation somewhat restricts its use—but it provokes sufficient interest to have been the subject of a recent two-day symposium.³⁰ Among other actions dithranol will suppress mitotic activity.³¹ Together with tar baths and ultraviolet radiation it is the mainstay in the Ingram³² or Leeds regimen so popular with British dermatologists. Dithranol works best for inpatients, in combination with the advantages of the rest and relaxation of hospital life and the all-important skilled nursing and attention to detail. Intensive courses of outpatient treatment are possible.

The need for an average of two to three weeks of inpatient care makes dithranol an expensive treatment but, nevertheless, one of the most quickly effective. The Lassar's paste preparations in varying strengths, usually from 0.05–0.5%, have much to recommend them for inpatient care, but more acceptable cream bases for dithranol may be more convenient for outpatient use. Dithranol may be used as a long-term maintenance treatment but is more often valuable for intensive courses. The remissions so achieved may last for weeks, months, or years (depending on how fast "the car's engine" is running), and are, perhaps, more lasting than those achieved by topical steroids.

Ultraviolet radiation and PUVA—The sunburn wavelengths of ultraviolet radiation (UV-B) have been used in the treatment of psoriasis for many decades—in, for example, the Ingram and Goeckerman regimens. The fact that these wavelengths do also cause sunburn imposes a need for care in their use. With the advent of treatment with psoralens and ultraviolet A (PUVA), UV-B suffered a temporary set-back. Nevertheless, PUVA has stimulated a vast interest in the photobiology of the skin, and with current concern about the safety of PUVA the value of UV-B is being more carefully and again more enthusiastically appraised.³³ For prolonged treatment the uncontrolled use by patients themselves of more and more powerful sources of UV-B must give rise to some misgivings. Nevertheless, the doses of ultraviolet given therapeutically seldom compare with those received by outdoor workers in the normal course of their work.³⁴

Long-wave ultraviolet radiation (UV-A) in reasonable doses has virtually no effect on psoriasis but when combined with oral or topical psoralens (PUVA) it becomes an extremely powerful remedy in many types of psoriasis where UV-B might not be tolerated.^{35–37} Apart from the problems of

setting up the necessary expensive equipment, and of patients having to travel to use it, PUVA has much immediate appeal. The treatment is clean and easy, effective, and the patient develops what is often considered a gorgeous tan.

Serious reservations about the long-term safety of PUVA still exist, however; the drug itself still has no product licence in Britain and is prescribed on a named-patient basis. Aging changes may undoubtedly occur. PUVA is likely also to cause certain neoplasms, squamous carcinoma and basal-cell carcinoma in particular. One study³⁸ has certainly indicated this possibility even after a few years, but other studies have not unless other carcinogens such as arsenic have also been used.³⁹ The more serious risks of melanoma and systemic malignancies must be considered as still under investigation and may remain so for several years yet—as must also the question whether PUVA acts as a carcinogen or as a promoting agent.⁴⁰

Current opinion suggests that PUVA may be relatively but not absolutely safe, and that the risks may be less than those of the other treatments in use for very severe cases. Lower doses of UV-A and intermittent courses of treatment are now being used rather than long-term maintenance aimed at keeping all patients 100% clear.

Patients who fail to respond to PUVA may be helped by studying the pharmacokinetics of the drug and how quickly it is absorbed, with suitable adjustment of timing.⁴¹ Other psoralens, natural or synthetic, may possibly be effective yet may lack some of the less desirable attributes of 8-methoxypsoralen.^{42 43} PUVA using topical psoralens plus UV-A has its enthusiasts and is clearly safer⁴⁴ but is also less easy to control.

Much has still to be learned about how PUVA can be most effectively and most safely used and how it may be used to advantage in combination with other treatments such as dithranol, topical steroids, and oral drugs such as aromatic retinoids, all aimed at reducing the amount of radiation required.

Very recently ultrasound has been shown to influence psoriasis.⁴⁵

Systemic drugs—A number of powerful drugs^{4 46} can control psoriasis. All have very real problems and hazards in their use, and can therefore be recommended only for the few patients with very severe disease. They are all contraindicated in pregnancy.

Systemic corticosteroids, especially the stronger (often but not necessarily fluorinated) ones, can be dramatically effective in clearing psoriasis in the short run but in general are strongly contraindicated because of an adverse effect on the long-term course of the disease. They have a very occasional place in some cases of erythrodermic psoriasis, pustular psoriasis, or perhaps psoriatic arthritis.

For over 20 years methotrexate has been an extremely effective and useful drug in the management of very severe psoriasis.⁴⁷ A single-dose weekly regimen is now most often adopted and has much less toxicity than daily dosage schedules.⁴ Nevertheless, even with most careful attention the problem of long-term hepatic toxicity looms large. Blood tests for hepatic function are inadequate to pick up early hepatic fibrosis and cirrhosis, and serial liver biopsies, perhaps annually, are necessary for patients on prolonged treatment. Possibly liver scans may allow fewer liver biopsies.⁴⁸ Estimates of the incidence of hepatic damage vary considerably,^{4 49–51} but fibrosis may be considered likely in 10% of cases having long-term treatment and frank cirrhosis in 5%. Watch must also be kept for evidence of toxicity affecting the blood, lungs,

and other organs. Small doses of methotrexate may be useful in the elderly, since long-term toxicity is less of a problem.

Hydroxyurea is also a useful drug, less effective than methotrexate, lacking the tendency to cause liver damage or gastric disturbances, but able to cause reversible bone marrow suppression.

The antimitotic drug razoxane is not currently recommended by the manufacturers for use in psoriasis. Early trials show that it is effective,⁵² also perhaps in psoriatic arthritis, but has a fairly definite tendency to cause marrow suppression though probably not hepatic damage. Currently it can be considered a useful third-line drug. Azathioprine, azaribine, mycophenolic acid, nitrogen mustard, and other antimitotic drugs have also been used for psoriasis with varying success and enthusiasm.⁴⁶

In Europe retinoic acid derivatives—the oral retinoids—have been available for some years but in Britain are still available only for clinical trials, though a product licence is expected shortly. They promise well.^{53 54} Undoubtedly effective, they do, nevertheless, cause side effects, especially on the skin and mucous membranes, but they also include the possibility of teratogenicity. Serious more life-threatening side effects have not been reported so far. The retinoid which promises to be valuable in the treatment of acne is somewhat different from the derivative used in psoriasis.⁵⁵ At this stage the retinoids seem safer than the other drugs so far discussed but somewhat less effective. It is too early to judge what part these and related compounds will come to play.

Problems with special types of psoriasis—Psoriatic erythroderma and generalised pustular psoriasis present special problems in management and nearly always require inpatient care, often urgent. Localised pustular psoriasis remains an intractable disease. Inflamed psoriasis does not tolerate stronger topical remedies and initially may need topical treatment more like that for eczema.

In general psoriatic arthritis is more benign than rheumatoid arthritis, but it may be of great severity.^{56 57} The arthritis is often best managed by rheumatologist and dermatologist together. Most cases do respond to simple measures. Corticosteroids are somewhat but not totally contraindicated. Control of the psoriasis by any means (dithranol, PUVA, antimitotic drugs, or retinoid) may help the arthritis in some cases, but this seems to run an independent course⁵⁸ especially in patients with sacroiliac or spinal lesions.

Summing-up—Most patients with psoriasis are best treated with topical remedies, aided perhaps by natural sunlight or UV-B. Such topical treatments can be intermittent or on a long-term basis. Results with long-term topical steroids may be disappointing.

For really severe cases PUVA has much to recommend it, if available, especially for patients over the age of 50 and provided that due watch is kept on the dose of UV-A. Pending the results of long-term follow-up studies, the choice of intermittent courses not aimed at 100% clearance of all lesions seems a reasonable compromise. The choice of other drugs might currently be methotrexate → hydroxyurea → razoxane but this pecking order will need to be adjusted to include the oral retinoids, which may well come higher. The permutations and combinations of all these remedies must be considered still to belong to the art rather than to the science of treatment.

R H CHAMPION

Consultant dermatologist,
Addenbrooke's Hospital,
Cambridge

- ¹ Weinstein GB, Lazarus GS, Karasek M, Roenigk HH, Stoughton RB, Vorhees JJ. Research needs in 11 major areas in dermatology. I. Psoriasis. *J Invest Dermatol* 1979;**73**:402-13.
- ² Farber EM, Cox AJ, eds. *Psoriasis: proceedings of the international symposium. Stanford University 1971*. Stanford: Stanford University Press, 1971.
- ³ Farber EM, Cox AJ, eds. *Proceedings of the 2nd international symposium. Stanford*. New York: Yorke Medical Books, 1977.
- ⁴ Baker H, Wilkinson DS. Psoriasis. In: Rook AJ, Wilkinson DS, Ebling FJ, eds. *Textbook of dermatology*. 3rd ed. Oxford: Blackwell, 1979:1315-61.
- ⁵ Baker H. Psoriasis—clinical features. *Br Med J* 1971;iii:231-3.
- ⁶ Hardie RA, Hunter JAA. Psoriasis. *Br J Hosp Med* 1978;**20**:13-23.
- ⁷ Champion RH. *Eczema and psoriasis*. 2nd ed. Fort Lee: Update Publishing International, 1980:4-34.
- ⁸ Grove GL. Epidermal cell kinetics in psoriasis. *Int J Dermatol* 1979;**18**:111-22.
- ⁹ Wright N. The kinetics of human epidermal cell populations in health and disease. In: Rook A, Savin J, eds. *Recent advances in dermatology* 5. Edinburgh: Churchill Livingstone, 1980:317-43.
- ¹⁰ Dobson RL. The inheritance of psoriasis. *Arch Dermatol* 1980;**116**:657.
- ¹¹ Baker H. Psoriasis. A review, parts I and II. *Dermatologica* 1975;**150**:16-25, 136-53.
- ¹² Voorhees JJ. Polyamines and psoriasis. *Arch Dermatol* 1979;**115**:943-4.
- ¹³ Lesiewicz J, Goldsmith LA. Ornithine decarboxylase in skin. *J Invest Dermatol* 1980;**75**:207-10.
- ¹⁴ Dahl MV, Lindroos WE, Nelson RD. Chemokinetic and chemotactic factors in psoriasis scale extracts. *J Invest Dermatol* 1978;**71**:402-6.
- ¹⁵ Wahba A, Cohen HA, Bar-Eli M, Gallily R. Enhanced chemotactic and phagocytic activities of leukocytes in psoriasis vulgaris. *J Invest Dermatol* 1978;**71**:186-8.
- ¹⁶ Michaëlsson G. Increased chemotactic activity of neutrophil leukocytes in psoriasis. *Br J Dermatol* 1980;**103**:351-6.
- ¹⁷ Mali JWH. Psoriasis: a dynamic disease. *Br J Dermatol* 1979;**101**:725-30.
- ¹⁸ Mier PD, Gommans JM, Roelfzema H. On the aetiology of psoriasis. *Br J Dermatol* 1980;**103**:457-60.
- ¹⁹ Sauder DN, Bailin PL, Sundeen J, Krakauer RS. Suppressor cell function in psoriasis. *Arch Dermatol* 1980;**116**:51-5.
- ²⁰ Wahba A. Immunological alterations in psoriasis. *Int J Dermatol* 1980;**19**:124-9.
- ²¹ Lazarus GS, Gilgor RS. Psoriasis, polymorphonuclear leukocytes and lithium carbonate. *Arch Dermatol* 1979;**115**:1183-4.
- ²² Skoven I, Thormann J. Lithium compounds and treatment of psoriasis. *Arch Dermatol* 1979;**115**:1185-7.
- ²³ Shuster S, Chapman PH, Rawlins MD. Psoriasis and cancer. *Br Med J* 1979;i:941-2.
- ²⁴ Anonymous. Psoriasis and stress. *Br Med J* 1978;ii:530-1.
- ²⁵ Anonymous. Outlook in psoriasis. *Br Med J* 1974;iv:365.
- ²⁶ Farber EM, Nall ML. The natural history of psoriasis in 5600 patients. *Dermatologica* 1974;**148**:1-18.
- ²⁷ Anonymous. Topical corticosteroids and relapses of psoriasis. *Br Med J* 1977;ii:988.
- ²⁸ Goeckerman WH. The treatment of psoriasis. *Northwest Medicine* 1925;**24**:229-31.
- ²⁹ Petroski JW, Barton JO, Kaidbey KK, Kligman AM. Updating the Goeckerman regimen for psoriasis. *Br J Dermatol* 1978;**98**:437-44.
- ³⁰ Shroet B. Symposium on dithranol. *Br J Dermatol* (to be published).
- ³¹ Fisher LB, Maibach HI. The effect of anthralin and its derivatives on epidermal cell kinetics. *J Invest Dermatol* 1975;**64**:338-41.
- ³² Ingram JT. The significance and management of psoriasis. *Br Med J* 1954;iii:823-8.
- ³³ van Weelden H, Young E, van der Leun JC. Therapy of psoriasis: comparison of photochemotherapy and several variants of phototherapy. *Br J Dermatol* 1980;**103**:1-9.
- ³⁴ Summer W. Photo-carcinogenicity: the physical basis of its exogenous causes. *Br J Dermatol* 1980;**102**:611-9.
- ³⁵ Parrish JA, Fitzpatrick TB, Tanenbaum L, Pathak MA. Photochemotherapy of psoriasis with oral methoxsalen and longwave ultraviolet light. *N Engl J Med* 1974;**291**:1207-11.
- ³⁶ Wolff K, Fitzpatrick TB, Parrish JA, et al. Photochemotherapy for psoriasis with orally administered methoxsalen. *Arch Dermatol* 1976;**112**:943-50.
- ³⁷ Briffa DV, Warin AP. Photochemotherapy in psoriasis: a review. *J R Soc Med* 1979;**72**:440-6.
- ³⁸ Stern RS, Thibodeau LA, Kleinerman RA, et al. Risk of cutaneous carcinoma in patients treated with oral methoxsalen photochemotherapy for psoriasis. *N Engl J Med* 1979;**300**:809-13.
- ³⁹ Hönigsmann H, Wolff K, Gschnait F, Brenner W, Jaschke E. Keratoses and long-term photochemotherapy. *J Am Acad Dermatol* 1980;**3**:406-14.
- ⁴⁰ Bridges B, Strauss G. Possible hazards of photochemotherapy for psoriasis. *Nature* 1980;**283**:523-4.
- ⁴¹ Stevenson IH, Kenicer KJA, Johnson BE, Frain-Bell W. Plasma 8-methoxypsoralen concentrations in photochemotherapy for psoriasis. *Br J Dermatol* 1981;**104**:57.
- ⁴² Hönigsmann H, Jaschke E, Gschnait F, Brenner W, Fritsch P, Wolff K. 5-Methoxypsoralen (Bergapten) in photochemotherapy of psoriasis. *Br J Dermatol* 1979;**101**:369-78.
- ⁴³ Dubertret L, Averbek D, Zajdela F, et al. Photochemotherapy (PUVA) of psoriasis using 3-carbethoxypsoralen, a non-carcinogenic compound in mice. *Br J Dermatol* 1979;**101**:379-89.
- ⁴⁴ Weber G. *Photochemotherapy. Information for doctors and patients*. London: Year Book Medical Publishers Ltd, 1980.
- ⁴⁵ Orenberg EK, Deneau DG, Farber EM. Response of chronic psoriatic plaques to localized heating induced by ultrasound. *Arch Dermatol* 1980;**116**:893-7.
- ⁴⁶ Farber EM, Perlman D, Abel EA. An appraisal of current systemic chemotherapy for psoriasis. *Arch Dermatol* 1976;**112**:1679-88.
- ⁴⁷ Weinstein GD. Methotrexate. *Ann Intern Med* 1977;**86**:199-204.
- ⁴⁸ Kersey PJ, Dahl MGC. Comparison of liver scan and liver biopsy in patients with psoriasis. *Br J Dermatol* 1980;**103**, suppl 18:15-6.
- ⁴⁹ Dahl MGC, Gregory MM, Scheuer PJ. Liver damage due to methotrexate in patients with psoriasis. *Br Med J* 1971;ii:625-30.
- ⁵⁰ Dahl MGC, Gregory MM, Scheuer PJ. Methotrexate hepatotoxicity in psoriasis—comparison of different dose regimens. *Br Med J* 1972;ii:654-6.
- ⁵¹ Robinson JK, Baughman RD, Auerbach R, Cimisi RJ. Methotrexate hepatotoxicity in psoriasis: consideration of liver biopsies at regular intervals. *Arch Dermatol* 1980;**116**:413-5.
- ⁵² Atherton DJ, Wells RS, Laurent MR, Williams YF. Razoxane (ICRF 159) in the treatment of psoriasis. *Br J Dermatol* 1980;**102**:307-17.
- ⁵³ Orfanos CE. Oral retinoids—present status. *Br J Dermatol* 1980;**103**:473-81.
- ⁵⁴ Peck GL. Retinoids in dermatology: an interim report. *Arch Dermatol* 1980;**116**:283-4.
- ⁵⁵ Peck GL, Olsen TG, Yoder FW, et al. Prolonged remissions of cystic and conglobate acne with 13-cis-retinoic acid. *N Engl J Med* 1979;**300**:329-33.
- ⁵⁶ Wright V, Moll JM, eds. *Seronegative polyarthritis*. Amsterdam: North Holland Publishing Co, 1976.
- ⁵⁷ Anonymous. Treatment of arthritis associated with psoriasis. *Br Med J* 1978;ii:262-3.
- ⁵⁸ Perlman SG, Gerber LH, Roberts M, Nigra TP, Barth WF. Photochemotherapy and psoriatic arthritis: a prospective study. *Ann Intern Med* 1979;**91**:717-22.