SOME ASPECTS OF THE TREATMENT OF SKIN DISEASES*

BY

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All dermatological affairs assume an importance greater than appears on the surface because they are a reflection of the same problems as concern medicine as a whole. They are a little complicated by external influences, but the fundamental principles which apply to medicine apply to the skin and are there made manifest. So it is with the problems of treatment, which more seriously test the ability of the physician as a healer of the sick than do most other departments of medical practice. It is an aspect of practice which each one of us should bring under review from time to time in a broad way, and this is perhaps more than ever necessary when therapeutic advances proceed as rapidly as has been the case in the past few decades.

There are certain fundamental principles which have guided the wise physician through the ages. They have a basis in careful clinical observation and are built upon sound experience. They have stood the test of time and satisfy the simple demands of common sense, and should form the basis of all our treatment. To these principles are attached in fashionable abundance a number of therapies, sometimes empirical, sometimes founded upon interesting and valuable scientific discovery, and sometimes mere fads, but there is ever present the danger that these accretions may obscure the sound principles in the hurly-burly of medical practice.

Some General Principles in Treatment

A first essential in treatment is to make an accurate diagnosis, to grasp the full significance of that diagnosis, and often to convey that significance to the patient. Diagnosis is not covered by a tabulated series of labels and the attachment of a particular label to a particular manifestation. Treatment does not consist merely in the administration of a certain drug filed under the heading of such a label. Diagnosis, and therefore treatment, rests almost entirely upon a careful history and a complete examination of the patient, including his whole skin. Special tests necessitating elaborate technical facilities are of very secondary importance and need not concern us here. In a considerable proportion of cases effective treatment demands no more than this taking of a history and clinical examination except that it shall be shared and understood by the patient.

The "Organic" Group of Skin Diseases

We find in dermatology that diseases fall broadly into two distinct groups. The first may be described by the old-fashioned term "organic." These are structural changes with little disturbance of function and include congenital abnormalities, infective diseases, and neoplasms. This constitutes the smaller group of dermatological ills seen by the doctor, and for each disease in this group there is a more

or less specific line of treatment, to be modified according to the characters and circumstances of the patient. In this field the physician may claim that it is he who treats the patient and that success depends almost entirely upon his knowledge and ability.

One or two examples may make my point clear. The diagnosis of erythema nodosum is not difficult. It is a reaction in a sensitized individual to organisms which have recently gained access to the blood stream from some focus of infection. Those are two very significant points. It is recognized that in this country more than 70% of those who suffer from erythema nodosum under the age of puberty do so by reason of a tuberculous infection. That, then, is one major aspect of the problem, and if treatment goes no further than a careful overhaul for active tuberculous disease in the patient and in those around him it has been to some purpose. Warty tuberculosis of the skin results from external contact with the tubercle bacillus. But again, though it may do no more than point to the occupation of the patient, it may on the other hand mean that the patient himself or someone in his family or in a wider circle of contact is the subject of open pulmonary tuberculosis and is the source of the organism. If the lesion is on the buttock it is almost certain that the patient is himself infected in lung or bowel or ischio-rectal region.

Erysipeloid is a common infection of the hand in those who handle pork, fish, game, rabbits, etc., and is due to *B. rhusiopathiae suis*. It does not cause abscess formation, lymphangitis, or adenitis, and is responsive to penicillin therapy. To make an error of diagnosis and diagnose pyoderma or cellulitis and to incise may lead to sepsis and unfortunate sequelae.

So simple an affection as impetigo is not just a matter of a label and specific treatment. Its presence about the head and face often indicates an underlying pediculosis capitis or a focal infection such as a fissure or aural, nasal, or dental sepsis. Furthermore, those in greasy or wet trades and those with greasy and wet skins are known to be particularly prone to sepsis, and treatment should be guided by these facts. Whatever the medication, a first indication is to keep the parts dry and avoid greasy applications.

These illustrations in the field of organic disease demonstrate the importance of an accurate diagnosis and all that it means in effective treatment.

The Functional Group

In the second group of dermatological ills, comprising perhaps 70% of all skin diseases, the stress is upon function, and structural changes play a minor part. In the first group we can almost imagine the disease pursuing its course independently of the patient. In the second group the disease is the patient, is essentially individual, and merely expresses the functional response of that individual to the particular circumstances in which he finds himself.

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We attach a number of labels to certain patterns of functional reaction which bear certain features, labels like eczema and urticaria, seborrhoeic dermatitis and psoriasis, but it is a grave error to imagine that the label is the disease and carries with it the implication of a definite course of treatment. To make a diagnosis here it is necessary to know something of the patient's background and inheritance, something of his health and temperament, his circumstances, his home and work, and to consider all those environmental influences which may bear upon and affect his reactions. To carry that diagnosis through to effective treatment it is necessary to convey to the patient an understanding of all these factors so as to enable him, with appropriate assistance, to achieve an adjustment and stability in relation to his environment. It is indeed the patient who treats himself.

Infantile eczema is an illustration of this type of disorder. The child has a sensitive skin provoked to functional disturbance—itching—by external factors such as exposure, or by internal disturbances such as teething, which would not annoy the normal child. Protective and antipruritic applications such as tar paste are employed, and sedative measures are prescribed internally. But the problem is not quite so simple. There is not only a sensitive skin or even a sensitive ectoderm, but a sensitive patient manifest in all his emotional and nervous reactions. This calls not only for great care and understanding in management immediately, but for consideration in relation to the training and rearing of the child and choice of school and career.

Such a child will generally be the offspring of a parent or parents of similar temperament, a likely aggravation for the patient and often responsible for an atmosphere of unrest and anxiety round the child. It may be necessary to remove the child, at least for a period, from the atmosphere during his early life. In any case success in treatment must be difficult if the parent cannot be brought to understand the nature of the disturbance.

Rosacea is another label that is entirely inadequate unless the significance of the reaction is appreciated by doctor and patient. A variant of blushing, it is clearly subject to emotional and endocrine imbalance such as occurs at puberty or the menopause. Not only the psychological but all those influences external and internal which can bear upon blushing and flushing must be brought under review, and the possibility of hypertension as another expression of vasomotor instability must not be overlooked, for, if present, it will be the major symptom. Fortunately this very embarrassing symptom, rosacea, is readily responsive to simple measures—small fractional doses of x rays with a mild sulphur and salicylic ointment locally and phenobarbitone internally. But success will be short-lived if the wider psychological and environmental aspects of each case are not dealt with and the patient given insight into them.

So it is with all affections in this large group of ills. The label of industrial dermatitis or psoriasis, of sycosis barbae, pruritus ani, or eczema, is not sufficient to indicate treatment. The same treatment may upon occasion be applicable to all, for the cause of the disturbance may turn upon a question of domestic harmony, malnutrition, or endocrine dysfunction, or other endogenous influences of greater importance than the apparent external factor. All aspects of the problem must receive careful assessment in each case, for it is this integrity in diagnosis that is essential to treatment. This was, often unconsciously, appreciated by the wise physician of old, the good family practitioner. It is something which in the face of rapid scientific progress we are apt to lose, and it is something which cannot easily be reconciled with an ordered, scientific, and regimented medical service. At the same time its recognition in a big

way rather than on the individual plane constitutes one of the major advances in treatment through the development of psychological and social medicine.

An Important Point

A second point of major importance in treatment is to remember that the disease affects a human being and not a laboratory apparatus; that the disease has a natural history and tends to run a natural course of its own; further, that its presence automatically sets in action a variety of defence mechanisms about some of which we may understand a little but about many of which we certainly know nothing. It is undoubtedly these defence mechanisms which ultimately effect a cure, and we must be careful not to interfere with or harm their activities, and must cut across them only with caution. In short, even with the most modern and scientific weapons it is still the patient and not the disease that must be treated.

In this regard it is pertinent to mention the value of rest, to stress the harm caused by interference, and to encourage a masterly inactivity. There is every inducement to practise the reverse. The patient urges us to do something, and to do something different. We are encouraged by a spate of medical literature not always based on a broad clinical experience. Such a wealth of medical preparations is placed at our disposal and so many are the diseases of uncertain aetiology that there is ever present the temptation to try one of the new drugs which seem to exercise magical powers. Sometimes the magic works, sometimes it does obvious harm, but how often it does unseen harm it is not possible to tell.

If dermatology reflects what happens in other spheres of medical practice—and I do not doubt that it does—this ability of the physician to create harmful disease should be stressed. The dermatologist constantly sees, and himself often produces, extensive dermatoses or disabling illnesses that have their origin in little or nothing and are literally created by an excess of treatment and misdirected zeal. We are ourselves in large part responsible for this—encouraging patient and worker to attack with treatment the most trivial of lesions, forgetful of or having lost faith in the healing powers of nature and particularly of the skin, and unmindful of the fact that this is the age of therapeutic danger. Antiseptics, sulphonamides, penicillin, and adhesive plasters readily convert a harmless abrasion into an area of eczematous dermatitis, and immediately a serious offence is created.

These problems are all too familiar. I may quote three cases. The first is that of an old lady of 84 who had never suffered from her skin in her life. Six months previously she was burnt by a poultice applied to relieve pain in her chest. This burn was treated with penicillin and sulphonamides locally. The resulting sulphonamide dermatitis was treated with tar, to which she was sensitive, and now after six months she is distracted with a widespread eczema and intolerable itching.

The second case is that of a man of 48 who scratched his leg two months ago. This was treated with sulphonamides and penicillin in the ambulance room at his works, and now he must be admitted to hospital for at least six weeks to treat the dermatitis and oedema of the leg and the generalized spread resulting from treatment.

If nothing had been done in these cases it is probable that the patients would have recovered rapidly.

The third case, that of a middle-aged woman with a widespread dermatitis from the use of a liniment to relieve pain in a joint, is less unreasonable perhaps, but we should always be alive to the harm that may result from interference.

The skin is slow to forgive, eczema begets eczema, and what is produced in a few days may take months or years to subdue. The inherent sensitiveness of the skin, the powerful sensitizing properties of the metabolites which such reactions evoke, the effects upon the blood chemistry and upon the mind, to mention only a few of the major influences which are set in motion, are profound, and we understand very little about them.

In dermatology, and no doubt in other spheres, it is of importance to be able to recognize the ill-effects of treatment as opposed to the evidences of the disease itself. I try to remember in practice to suspend all treatment in a case that is getting worse under seemingly rational treatment and especially in a case that is getting out of hand. It is always instructive to watch the effects of no treatment at all, and one's measure of success should always be gauged against that yardstick. It may be wise for the inactivity to take the form of some bland medicament, and there are still many to be obtained, even though this is not as easy as in the days before the war, for "austerity" substitutes are apt to masquerade under the guise of old labels, especially in relation to oils and fats.

Very many of the dermatological ills of which I have been speaking are themselves the expression of a patient's loss of confidence in himself. Whether or not that is the case, it is very easy for the subject of a functional disorder of the skin, as eczema or psoriasis, to become anxious and feel insecure and doubtful of the future, more particularly if his disease seems to be a mystery to himself and his doctor.

Treat with confidence. It is probably true to-day, as it has ever been in the past, that the more able and experienced the physician the fewer and the simpler his therapies. With a full and careful diagnosis—and this rarely demands much technical assistance—and if the nature of the remedies prescribed is known, the physician should treat his patient with complete confidence and not be disturbed from that course without serious consideration.

Local Treatment

The question of the use of soap and water is always an intriguing one for the patient. Few skin affections are infectious or contagious, and so far as the attendant upon the patient is concerned, the nurse or doctor, ordinary soap-and-water toilet cleanliness is desirable and necessary, but nothing more. The lavish use of antiseptics is unwise, and the wearing of rubber gloves is an offence which may do much harm in the field of treatment, confirming the patient in his feeling of being an outcast.

So far as the patient is concerned the use of soap and water must be guided by common sense. In some affections it is essential to wash thoroughly, as in seborrhoeic disorders not associated with eczematous dermatitis. Seborrhoeic pityriasis and acne vulgaris respond to washing, and the addition of one of the modern soapless detergents to the washing water, by cleaning the skin more thoroughly of its excess of grease, will hasten the response. Expressions of skin sensitiveness like rosacea and eczematous dermatitis are aggravated by this procedure, and it is often wise entirely to avoid washing the affected parts. It is of importance that the patient shall understand his ill and shall not approach it as a leprous offence of which he must be cleansed by vigorous scrubbing. The patient will often comment upon the injustice of his having skin trouble when he is so much more careful about his toilet than his neighbour. It is just that type of patient who is most likely to show a skin disorder, by reason of his temperament, but it is essential that his false approach to the problem should be corrected.

The same yardstick of common sense should be applied to the use of protective barrier creams before starting work in the factory or the home and to the use of cleansing agents after work. The suitable employment of such measures can be most beneficial, but if employed without understanding and intelligence they may do great harm.

I want now to turn to some particular aspects of dermatological treatment. Local applications are rarely to be employed as therapeutic weapons: seldom is it desirable to attack. The purpose of local treatment is commonly to support and protect the skin to effect its own recovery, to improve the conditions under which it is functioning. For that reason the character and form of the application, its physical qualities, and the manner in which it is employed and applied are of more importance than the ingredients.

Local or general baths and lotions are valuable, especially for infected and eroded surfaces, but they should be applied for only a limited period for fear of soddening and macerating the tissues. They should not be irritant as regards either temperature or ingredients; they should be isotonic and not unduly astringent. Normal saline is excellent for most purposes. As a mild astringent and antiseptic potassium permanganate 1 in 8,000 is valuable. Solutions of the dyes are bland, antipruritic, antiseptic, and astringent, but are not to be used to the point of producing scales or scabs which prevent the discharge of infected exudates.

Wet dressings are occasionally of value in soothing and reducing the acute oedema which may accompany sensitization reactions; cold-water bandages are suitable, but should not be used for more than twenty-four to forty-eight hours.

Fomentations should not be left in place for four hours under oiled silk or they will macerate the skin, and if employed in the treatment of infections they will encourage spread. A session of three or four fomentations applied in the course of an hour, once or twice a day, is the better routine. The starch and boric acid poultice is soothing and cleansing for sore and infected surfaces, but a session of two or three, replaced every three or four hours before they have set hard, is preferable to a twelve- or twenty-four-hour application followed by the tearing of the stiffened starch from the skin.

Calamine lotion is a useful application when properly employed. It should not be used as a wet dressing, but should be applied to the skin like whitewash, with a brush, and should be allowed to dry before bandaging. A thin stockinet sleeve (of the type used as padding in the orthopaedic departments) is an admirable dressing. If the lotion is applied with cotton-wool the powder which should be on the skin remains in the wool. The lotion must contain sufficient powder, and I would suggest a prescription of the following proportions:

R/ Calamine	}	...	...	aa 40 gr. (2.6 g.)
Zinc oxide				
Glycerin		...		30 min. (1.8 ml.)
Aq. calcis		...		ad 1 oz. (28.4 ml.)
Ft. lot.				

If too astringent this may be alternated with or replaced by the following elegant liniment:

R/ Calamine	}	...	...	40 gr. (2.6 g.)
Lanolin				
Ol. oliv.		...		30 gr. (2 g.)
Aq. calcis		...		aa ad 1 oz. (28.4 ml.)
Ft. lin.				

By far the most valuable local application, however, is Lassar's paste. Soothing and protective, it rests the skin, protects it from changes of temperature and from the

fering fingers of patient, nurse, and doctor and from inquisitive eyes. Containing as it does 50% bland powder, it does not heat the skin or interfere with respiration or secretion, and it can—as can calamine lotion and liniment—carry a mild antipruritic such as 2% carbolic acid or tar, or a mild mercurial antiseptic. The paste should be smeared on the skin so as to obscure the affected areas and should be covered with stockinet and left undisturbed, further paste being applied when necessary. The virtue lies in the physical character of this stiff paste, and it is important that it should be well dispensed, as is true of most applications used on the skin.

I have never subscribed to the view that doctors were efficient dispensers of dermatological preparations, and have some sympathy with the patient who complains that the hospital preparations are not the same as those which he obtains from his doctor.

A nurse or patient may destroy the value of a paste by heating it for greater ease of application. It should be applied patiently, gently, and evenly with the finger, and to the skin and not to a piece of lint.

The soft paraffin available at the moment is of an inferior quality and lower melting point. The pastes dispensed from this material are unsatisfactory, and the value of treatment is thereby impaired. Psoriasis, which will clear rapidly on Lassar's paste with dithranol 2 gr. to the ounce (4 mg./g.), may show no response to a paste dispensed with this paraffin. The addition of anhydrous lanolin has helped to correct the fault. Titanium dioxide is a bland powder with valuable properties, and can be usefully combined with soft paraffin and an emulsifying base to form a paste.

It is, I think, this important fact of the physical characters of the application rather than the ingredients which accounts for disappointment over the introduction of emulsified bases. These have not, in my experience, made much difference to the local treatment of skin diseases. In theory they are more penetrating and carry the medicaments into more intimate contact with the skin, but, as I have suggested, this is not nearly so important as the protection and support afforded by the preparation, and in this regard soft paraffin remains an invaluable base. The great value of the emulsified base often incorporated in ointments and pastes is that it facilitates their removal, and this is appreciated in treating the scalp.

I would suggest, however, that a practitioner should rarely go beyond the range of those simple and tried remedies which I have enumerated. I would particularly deprecate the use of the anaesthetic ointments and applications now on the market. They readily provoke a sensitization dermatitis which may become widespread and distressing and may leave the skin in a highly sensitive state for a long period.

There is a general feeling that a great increase has occurred in the number of cases of sensitization dermatitis, and not only to these recognized sensitizing agents. I believe this is true, and that eczematous dermatitis is often much more intractable than it was before the war. It has been suggested that diet may play a part in this, and it is possible, though my temperament would incline me to regard emotional and nervous frustration over the past decade as a more potent influence. I would not, however, dismiss the part which may be played by the increasing introduction of sensitizing drugs into topical applications—anaesthetic drugs, sulphonamides, and penicillin being placed high on the list. I have already referred to the intractable character of epidermal sensitization once it is set in motion, and this is an added reason for the limitation of local therapy to simple measures.

Sulphonamides and Penicillin

When sulphonamides or penicillin are considered necessary it is preferable that they should be given by mouth or parenterally, for sensitization by this route, though it may not be helpful, is not such an intractable problem as epidermal sensitization.

Though these drugs have saved lives and proved their value in surgery and in war, that does not justify their promiscuous and irrational use in other spheres and the ready production of disabling dermatoses.

In dermatology it is almost always desirable to employ sulphonamides by mouth and not locally. I believe that the period over which the drug is given should bear some relation to the natural course of the disease. I believe also that dosage should be reasonable and not massive or toxic, and should not be such as to embarrass the natural defence mechanisms of the body, and particularly of the skin, but should assist that natural defence. It is apt to be forgotten that there is a patient when these relatively simple skin infections are attacked, and, with minds charged with chemotherapy, we too often disregard other important factors in the case which relate to the soil which has fallen victim to the infection.

I should qualify this and state that I believe that in certain sites and under certain conditions pathogenic organisms may thrive on a skin or mucous membrane surface without infecting that surface, and a topical application may then serve a useful purpose.

Penicillin has a very small place in ordinary dermatological practice. As a local application, and particularly as a cream or ointment, it is a menace, and penicillin dermatitis has become a common diagnosis in the out-patient department and is a very troublesome affection. It would seem rarely to be necessary to employ the drug for the majority of surface skin infections where there are other effective remedies, and its use in eczematous affections, whether infected or not, carries a high risk of serious aggravation. There would seem to be some clinical evidence that in the parenteral treatment of deeper infections like boils and carbuncles the drug may cut across the natural defence mechanisms and leave the patient, after the cure of the initial lesion, more vulnerable than he was previously.

In this field let me again stress the undesirability of unnecessary interference. Pustules, boils, and carbuncles are better left alone. Squeezing and surgical interference aggravate. Dry heat, short-wave therapy, and x rays are better local measures.

X-ray Therapy

I cannot leave the field of local therapy without a word about x rays. When used in small fractional dosage, unfiltered and at low voltage (indeed, as Grenz rays if available), they are invaluable in the treatment of all disorders of function in the skin. Dosage and the spacing of treatments must be accurate. The treatment must form part of a scheme of general treatment, for it is only local therapy and is wasted if not supported by general measures. For fear of inadvertent overdosage great care should be taken to ascertain whether the patient has previously received superficial x-ray therapy.

Every patient undergoing x-ray therapy should receive a card recording the dosage given and should be warned to present that card whenever further x-ray treatment is under consideration. This is particularly necessary when giving more than a fractional dose, as in the treatment of ring-worm of scalp, keloid, and benign or malignant tumours. Grenz rays are relatively safe, and it is to be hoped that

they will again be made available and will be more widely employed in place of x rays.

Thorium X has not, in my hands, been of much value. It will pale, but not clear, a port-wine stain, though it is the only measure that may be effective in that rare dermatosis, parapsoriasis. Theoretically thorium X, as a source of alpha particles, should be a useful and safe measure in the treatment of superficial affections, but it has proved disappointing.

General Treatment

My previous remarks indicate the stress I would place upon the general approach to and investigation and understanding of the dermatological problem as a part of treatment. I would equally stress the importance of general as against local treatment, and general treatment may include the administration of drugs.

I have time for only a word or two upon a few of the drugs more recently introduced, most of them dangerous drugs about which we still have much to learn. They should be used with caution and only where the character, gravity, or intractability of the affection justifies it, and patients so treated should be kept under close clinical observation.

I have mentioned the sulphonamides, which can help considerably in the control of pyogenic affections and in some other ills, such as dermatitis herpetiformis, where the effect would appear to be along some other channel than the combating of infection.

Penicillin is of limited value in dermatology, but will sometimes clear or relieve cases of chronic or recurrent erysipelas or chronic lymphangitis and elephantiasis. One of the distressing effects of penicillin therapy—viz., pruritus and urticaria—may be controlled by another type of drug, the antihistamines. These again are of more interest from the laboratory and experimental point of view than the clinical, but they may be helpful in cases of allergic reaction of known cause and limited course. We cannot feel entirely happy, however, in introducing agents into the system which counteract so essential a metabolite as histamine.

I must say a word about the use of calciferol in massive dosage as employed in the treatment of lupus vulgaris. As a vitamin it may be regarded as harmless, but in this dosage it is dangerous and should not be employed over any long period in the treatment of trivial affections. The effects in lupus vulgaris and in sarcoidosis may be quite remarkable, but a careful watch has to be kept upon the blood chemistry and particularly upon renal function.

The general treatment of disorders of function calls for a careful assessment of the patient as a whole and his adjustment to life and his environment. That assessment must be appreciated and understood by the patient if treatment is to achieve success. I have already referred to this.

Symptomatic treatment will often assist and encourage the patient in his efforts, but it must be sustained and be employed as a help and not as a direct or specific therapy to be prescribed for a limited period. In ideal circumstances the patient employs such symptomatic remedies as the doctor suggests in the light of his understanding of his problem and of the purpose of those remedies. Again, it is important that the patient shall find benefit from and not be disturbed by such measures. They may serve as a supplement to the diet, a substitute for a holiday, an antidote to overwork, worry, or fatigue, or even to counter the stress of an unsuitable climate. They are not of themselves cures for a disease but rather comforts for the patient, and should be recognized as such, and should be employed in a very individual manner and with proper understanding.

GLOBIN INSULIN: A CLINICAL STUDY

BY

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Globin insulin (G.I.) was introduced in 1943 as a slow-acting insulin intermediate in duration of action between protamine-zinc insulin (P.Z.I.) and soluble insulin (S.I.). It is in many respects similar in action to Hagedorn's original protamine or delay insulin. It has been slow to gain recognition in this country, but from the patient's point of view offers the obvious advantage of simplicity, and now that the management of diabetes has become the inculcation of a *modus vivendi* rather than a *regimen valetudinis* it is important to eliminate time-consuming or fussy procedures so far as is possible.

Material

This survey is based on the records of 366 ambulant patients under regular observation who have been taking globin insulin for one to four years. They are drawn from the diabetic clinics of the Royal Sussex County Hospital and the New Sussex Hospital, Brighton, and from private practice. At the present time 68% of those attending one clinic and 66% of those attending the other are on globin insulin. The majority of the patients already attending the clinics were balanced on a combination of P.Z.I. and S.I. given before breakfast. It was recognized that in order to obtain the expected action of S.I. it must not be mixed in the syringe with P.Z.I. (Wauchope, 1940; Peck, 1943), and most of the patients had been taught either to inject one kind of insulin immediately after the other through the same needle or to give two injections. When patients mixed the two kinds of insulin in the syringe the dose of S.I. was equal to or greater than that of P.Z.I. and was difficult to assess owing to variations in the amount of mixing (Wauchope, 1940). A few patients were satisfactorily balanced on one dose of P.Z.I., and a few older people of regular habits remained satisfied with two doses of S.I. a day.

At the time globin insulin was introduced the war was in its fourth year, air raids were frequent, and almost all the diabetics attending the clinics were in full work in factories, civil employment, household duties, etc. Many were air-raid wardens in addition. Their hours were irregular, their sleep interrupted, and the insulin had often to be given in poor light. In these circumstances from late 1943 onwards new patients were started on a single dose of globin insulin, usually before breakfast: they were balanced as out-patients unless their illness was first recognized by the onset of coma.

The diet utilized the protein and fat allowed by the Ministry of Food, which, together with the bacon and egg rations, supplied about 1,400 calories: C., 120; P., 280; F., 1,035 (C., 30 g.; P., 70 g.; F., 115 g.). The rest of the calories required were made up mainly of carbohydrate and such protein on "points" as was available. A start was made with 200 g. of carbohydrate, which was added to according to the needs of the patient. In practice very few eat the whole of the fat ration and many have at least one meal a day at a canteen or restaurant.

The results were unexpectedly successful, and gradually G.I. became the insulin of choice. Many patients who had been on P.Z.I. and S.I. and who for one reason or another needed readjustment were changed to G.I.

The times of the clinics allow for a routine blood-sugar estimation about four hours after insulin and breakfast; the patients test their own morning and evening specimens of urine and bring a chart or notebook for inspection.