used, and that these extracts in the very large doses given were responsible for the ultimately satisfactory blood regeneration. This possibility seems unlikely, since Cases I and III showed little or no rise in the blood count after quite large initial doses of campolon and anahaemin. Moreover, the concentration of such additional factors in liver extract is likely to be much greater in crude preparations like campolon than in the refined extracts anahaemin and neo-hepatex (Evans Sons Lescher and Webb), and it is seen from Figs. 1 and 3 that campolon was not given during the period of massive therapy which produced rapid blood regeneration. The effect of campoferron can probably be discounted, since the dose given was small, and when used alone for 11 days in Case III this preparation produced a small reticulocytosis but no rise in the blood count.

Attention is drawn to the double reticulocyte response which occurred during the period of massive therapy in Cases I and III. The phenomenon was not discernible in Case II, perhaps because of the infrequency of the observations during this period. The time relationships of these reticulocyte crises suggest that the first was due to parenteral therapy, and the second to the ingestion of whole liver. The occurrence of this second reticulocytosis, and the fact that it was accompanied and followed by rapid blood regeneration, are further evidence that whole liver provided essential factors which were not present in the parenteral extracts.

The characteristics of the responses shown by the cases under discussion suggest an analogy with the macrocytic anaemia of sprue and other steatorrheas, in which it has been noted that in some cases blood regeneration does not follow the reticulocytosis produced by parenteral liver extracts unless a high protein diet is also given. Davidson (1939) has described a case of this type and suggested that the high intake of protein might be necessary for the formation of red cell stroma. Of particular interest is the fact that one of the constituents of the diet used in his case was 1/2 lb. of liver daily. Moreover, I have recently studied 3 cases of macrocytic anaemia associated with steatorrhea which were refractory to parenteral extracts but responded rapidly when whole liver was given without any other alteration in the diet. It is hoped to publish these cases at an early date. These observations suggest that in cases of macrocytic anaemia of pregnancy and the puerperium of the type here described there may exist a deficiency of factors present in whole liver similar to those which are lacking in some cases of macrocytic anaemia associated with steatorrhea. The nature of these factors and the causes which produced deficiency in the cases described are quite obscure. Certainly the histories do not point to direct dietary deficiency, and although a temporary depression of absorption from the intestine brought about by the pregnancy would explain the findings, there is no direct evidence that such a condition existed.

Summary

Three cases of macrocytic anaemia of pregnancy and the puerperium are described. The results of treatment showed that deficiency of the anti-pernicious-anaemia principle was not the only factor concerned in the production of the anaemia. Reticulocytosis after injection of liver extract may not be followed by remission in the macrocytic anaemia of pregnancy. The administration of whole liver appeared to provide other factors necessary for blood regeneration. An analogy is drawn between these cases and the macrocytic anaemia associated with steatorrhea.

REFERENCES

- British Encyclopaedia of Medical Practice*, 1936, 1, 441, Butterworth.
Davidson, L. S. P. (1939). *Edinb. med. J.*, **46**, 474.
— Davis, L. J., and Innes, J. (1942). *British Medical Journal*, **2**, 31.
Sodeman, W. A. (1940). *Amer. J. med. Sci.*, **200**, 117.
Stevenson, E. M. K. (1937-8). *Trans. Edinb. obstet. Soc.*, **58**, 81.
Strauss, M. B., and Castle, W. B. (1933). *Amer. J. med. Sci.*, **185**, 539.
Ungley, C. C. (1938). *Lancet*, **1**, 925.
Vaughan, J. M. (1936). *The Anaemias*, p. 121. Oxford Med. Publications, London.

Taking advantage of the investigation by bronchoscopy of patients suffering from various pulmonary lesions, L. Tuft and N. M. Levin (*Amer. J. med. Sci.*, 1942, **203**, 717) took samples of bronchial secretion before and after the intravenous injection of sodium iodide. The iodide was detected in the bronchial secretion within 15 to 20 minutes after intravenous injection. The authors believe that the excretion of iodides into the bronchial tree accounts for their expectorant action.

ECONOMY IN FATS AND OILS IN TREATMENT OF SKIN DISEASES

BY

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In September, 1939, it was realized that the shortage of fats and oils which would inevitably occur might in time seriously affect the treatment of diseases of the skin. It was then recommended that wet dressings and varnishes should be used whenever possible in place of ointment and paste preparations. Such substitution is not, however, universally applicable. Just as some types of inflammatory skin diseases, particularly inflammatory processes of the eczematous type, are intolerant to greasy applications of all descriptions in certain phases of their course, so other inflammatory conditions, including most cases presenting the eczema type of inflammation, demand grease in some form if a response to treatment is to be achieved. These well-known facts can only be interpreted as showing that processes or reactions which occur at the point of contact between the epidermal surface on the one hand and the opposing surface of the vehicle containing the therapeutic agent on the other have a profound influence on the course of the disease, and this quite apart from any known pharmacological action of substances incorporated in the vehicle. Greasy bases are therefore essential and irreplaceable in dermatological therapy.

A substantial quantity of a greasy base must be used in the treatment of a case. For example, 2 lb. of a paste containing 15% zinc oxide in paraff. moll. is necessary for a single adequate dressing of an eczematous eruption involving the entire body, 6 oz. for an arm and hand only, and 3 oz. for a hand and fingers only. Less is required if zinc oxide or other inert powder employed to give the paste consistence is omitted; but it has been pointed out that the nature of the base may be all-important and determine success or failure with an incorporated drug, and it frequently happens that the paste consistence is essential. To remove a paste from the inflamed skin a preliminary softening and cleansing with a mineral or vegetable oil is necessary, followed by washing with soap and water. The oil and soap add to the total amount of fats and oils used in the treatment of the disease.

As there is no substitute for grease, economy in its use can only be achieved by some procedure or manipulation that eliminates the necessity for using oil and soap in conjunction with it, and this can be done.

Skin-cleansing Substances

The following substances can be added to a bath in small amounts or used in the same way as liquid soap; they will remove from the skin a paste containing 15% zinc oxide without a preliminary cleansing of the skin with oil:

- Sodium salt of highly sulphonated oleic acid (M 1337)*
- Polyethenoxy-ether of cetyl alcohol (M 1344)
- The sodium salt of the sulphuric ester of sperm oil alcohol (M 1773)
- Cetyltrimethyl ammonium bromide

These substances have been used as cleansing agents with no deleterious effect on acutely eczematous skin. They are not primary irritants and, except in the rarest instances, are not substances to which idiosyncrasy may be expected. The latter statement can of course be applied to any widely used skin application or skin contact substance, either therapeutic or cosmetic, or to wearing apparel.

The removal of a pomade with a soft paraffin base which has been thoroughly rubbed into the hair and scalp in the female is an extremely arduous and frequently disappointing procedure when soap preparations are used, but these substances can completely and easily cleanse such a scalp.

* These substances are standardized mixtures to which it would be difficult to assign a precise chemical definition, and for this reason a number is appended to a general descriptive nomenclature.

Emulsifying Agents

Another method of economizing in oil is to incorporate an emulsifying agent in the ointment base. The following formulae have been tried:

	Parts
B Paraff. moll.	25
Octadecyl alcohol	2-4
Diethylene glycol distearate	2.5-5
Sodium cetyl sulphate (15% paste)	1
Water	22-26

This emulsion must be kept in a closed container to avoid evaporation.

B Tetraethenoxy-cetyl alcohol	10-20 g.
Paraff. moll.	ad 100 g.

B Cetyl alcohol — 4 mols	} parts, of this 10-20 g.
ethylene oxide	
Cetyl alcohol	
Sodium cetyl sulphate	
Paraff. moll.	ad 100 g.

To these preparations may be added any of the ingredients commonly incorporated in the ointment bases—i.e., zinc oxide, ichthammol, mercury, sulphur, etc.

These three formulae have been used with the addition of 15% zinc oxide and an active ingredient such as ichthammol or ammoniated mercury in the treatment of a sufficient number of eczematous skin eruptions to give convincing evidence that they fulfil the same conditions as regards suitability as was found in the case of the cleansing agents. To remove these preparations from the skin no oil is required, and considerably less soap is used than is necessary when a cleansing oil has been applied before the soap and water in the removal of an ordinary paste base; sometimes it is possible to dispense with soap altogether.

Comment

In the case of the cleansing agents, oil and soap are dispensed with; in the case of the emulsifying bases, oil is not necessary and little or no soap is used. The extent of the economy which might result from the employment of these preparations or others of similar nature can be judged when the oil and soap consumption of a large department for the treatment of skin diseases is examined. The weekly requirement in one such department containing 60 beds and catering for the daily treatment of from 20 to 30 out-patients referred from the consultation-room is about 400 oz. of oil and 12 lb. of soap. In addition to economy in actual material there is a considerable reduction in the time required to carry out treatment. To prepare for a bath a case in which a paste has been applied to the entire body surface at least half an hour's work with oil is necessary, and at least part of this operation requires the services of a nurse.

Finally, the removal of ordinary pastes necessitates a considerable amount of friction, which has some temporary deleterious effect on the course of an eczematous eruption. The employment of either type of preparation described above obviates this drawback.

My thanks are due to Imperial Chemical Industries (Pharmaceuticals) Ltd., Manchester, for the preparations used in this investigation.

THE BREAD FACTOR IN A WARTIME HUMAN DIETARY

BY

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Contradictory statements have appeared in the literature as to the merits or demerits of national wheatmeal bread and of the proposals to fortify this bread with calcium in the form of creta praeparata or white bread with aneurin (vitamin B₁) and calcium in the same form. It was thought, therefore, to be of interest to record the results of some feeding experiments recently carried out with rats.

The experiments were designed to determine the effect on the growth of young rats of substituting national wheatmeal bread or fortified white bread for the ordinary white bread in the basal diet. This basal diet was drawn up from the results of a dietary survey carried out in a North of Scotland town

in the spring of 1941, and represents the average diet of a number of families spending up to 7s. per head weekly on food. The rats' basal diet contained all the various foods in the proportion in which they were found in the human diet. The methods used in the preparation of the food, which was in all cases fed *ad lib.*, were similar to those described for an earlier dietary experiment at this institute (Orr, Thomson, and Garry, 1936). Since "fortified" white bread was not available in this part of the country, white bread supplemented with chalk and aneurin in the proportions officially proposed was employed for this purpose.

Experiment I

In the first experiment six groups of rats were used, and the diets and weight increases for each group over a period of eight weeks are shown in the accompanying table. The

Table showing Diets and Weight Increases for Experiments I and II

Group	Diet		Males			Females		
	Type of Bread	Supplement	Initial Weight	Weight After 8 Weeks	Average Weekly Gain	Initial Weight	Weight After 8 Weeks	Average Weekly Gain
			g.	g.	g.	g.	g.	g.
Experiment I								
1	White	—	42.4	191.9	18.7	40.4	149.4	13.6
2	N.W.M.	—	44.6	208.4	20.5	40.2	151.1	13.9
3	White	Ca + aneurin	43.7	228.2	23.1	42.1	168.0	15.7
4	N.W.M.	Ca	42.6	231.3	23.6	41.1	165.5	15.6
5	White	Vitamins + minerals	43.7	227.3	23.0	40.8	166.9	15.8
6	White	Ca	40.3	205.9	20.7	38.5	156.7	14.8
Experiment II								
2	N.W.M.	—	40.5	208.2	21.0	39.5	157.9	14.8
3	N.W.M.	Ca + aneurin	40.3	242.7	25.3	39.5	186.4	18.4
4	N.W.M.	Ca	40.3	246.9	25.8	39.9	183.6	18.0
5	N.W.M.	Vitamins + minerals	40.3	259.1	27.4	39.2	192.5	19.2

rats were given their respective diets at weaning, approximately half of them being taken from the stock colony, the others being the offspring of parents which had been reared on the corresponding experimental diets in a preliminary experiment. Each group contained 14 or 15 males and 15 females, the sexes being caged separately. The mineral-vitamin supplement used in Group 5 contained calcium, phosphorus, iron, and vitamins A, B₁, and C in amounts such as would, if fed in proportion to the quantity supplied to the rats, have brought the daily intake of the members of the families surveyed up to Ca, 1 g.; P, 1.3 g.; Fe, 15 mg.; vitamin A, 4,000 I.U.; vitamin C, 1,500 I.U.; and vitamin B₁ 390 I.U. (i.e., ratio to calories 1:5).

The figures show that for the male rats the average weekly gain of 18.7 g. in the control group has been increased to 20.5 g. by the substitution of national wheatmeal for white bread. A similar increase (20.7 g.) was found in the group which received white bread with a calcium supplement. A greater improvement was found in the groups which received both additional calcium and vitamin B₁, whether the B₁ was given as aneurin or as national wheatmeal bread. In these groups the average weekly gains were 23.1, 23.6, and 23.0 g. Similar results hold also for the groups of females, except that the substitution of wheatmeal bread for white had little effect on the rate of weight increase. The marked improvement caused by simultaneous addition of calcium and vitamin B₁ was again observed.

Experiment II

Experiment II was intended to be a second-generation repetition of Experiment I, all the young rats in this test being the offspring of animals used in the growth tests just recorded. Unfortunately white bread was no longer available, so some modification of the groups was necessary. It was decided to test the effect of increasing the ratio of I.U. of vitamin B₁ to calories by adding extra aneurin. In Groups 2 and 4, which correspond to the groups of the same numbers in Experiment I, this ratio was 1:4.33. The amount of aneurin used as supplement for Group 3 brought this ratio up to 1:3, and the ratio for Group 5, with a mineral + vitamin supplement as in Experiment I (but with the complete B complex instead of B₁ alone), was 1:4. In this experiment each group contained 17 or 18 males and a like number of females.