(*iii*) Add 6.25 grammes of anhydrous potassium dihydrogen phosphate (KH_2PO_4).
(*iv*) Add 500 c.cm. of distilled water, stir till the stain is completely dissolved and set aside for 24 hours.
(*v*) Filter before use.
[Copied from FIELD (1941). *Trans. Roy. Soc. Trop. Med. Hyg.*, **35**, 35.]

The dried blood film is dipped for about two seconds in solution A, then washed for two or three seconds by gentle motion in a jar of ordinary water, then dipped for one second in solution B, immediately washed again in water for a second or two, and then allowed to dry, which takes only a few minutes.

With various lots of stain, the staining times may need to be varied a little. More time is needed in solution A than in solution B.

In a properly stained film, the red cells hardly show at all, the leucocytes including their granules are well stained, the blood platelets are stained pinkish blue, and the malaria parasites are well seen, with red chromatin, blue protoplasm, and, in the maturer forms, hæmozoin pigment. The red cell containing the parasite is frequently invisible, although sometimes it can be seen faintly and Schuffner's dots may also be seen. Both sexual and asexual forms of the parasite show well.

Very minute forms of *P. falciparum* may be a little difficult to spot, but if present they are usually numerous.

No film should be reported positive merely on the finding of one or two 'doubtful' parasites. Parasites if present are usually present in fair numbers, and can almost always be detected within one minute. Prolonged search is usually not necessary.

By the general use of the rapid method of staining described, the accuracy of diagnosis of malaria can with very little trouble be greatly increased.

With the use of this method it is possible to adopt a policy of giving quinine only to those patients showing parasites, and the waste of quinine can be very greatly reduced; while those patients who have malaria can be properly treated.

Fifteen grains of quinine a day for seven days is usually enough to control an attack well, though some relapses will occur, as with any form of treatment. With infection with *P. falciparum* it may be advisable to give more quinine for the first forty-eight hours.

J. L.

PROTEIN HYDROLYSATES IN SHOCK AND INANITION

THE idea of the use of protein hydrolysates in conditions of hypoproteinæmia is not a new one; they were first used experimentally in starved animals thirty years ago. Recently, however, various writers have discussed the possibility of their intravenous administrations in human beings, and the conditions which seem to call for such medication are shock, hypoproteinæmia and inanition.

A certain amount of work has been done on this subject, but on a very limited scale, and mainly in America. Difficulty has been experienced in producing a hydrolysate which did not give rise to allergic or other reactions.

Work on this subject has been going on for some time in the Institute of Hygiene, Calcutta, under Dr. K. V. Krishnan, and when the famine conditions recently developed in Bengal, the work was accelerated, suitable protein hydrolysates were prepared by a modified method, and these have been widely used in the treatment of inanition caused by starvation.

An account of this work has reached us too late for publication in the present issue, and it will be published in our next issue.

Special Article

TREATMENT AND MANAGEMENT OF STARVING SICK DESTITUTES

PREPARED BY THE COMMITTEE OF ENQUIRY INTO EFFECTS OF STARVATION, INDIAN RESEARCH FUND ASSOCIATION

(*From the All-India Institute of Hygiene and Public Health, Calcutta*)

Introduction

THIS report is being written primarily at the request of the army and civil authorities who are undertaking the organization of emergency hospitals and camps for dealing with 'sick destitutes' in Bengal. For these emergency hospitals special lists of drugs and requirements (*vide* Appendix I) have been prepared to cover the essential needs only, and the treatment outlined in the present notes is based in general on the items included in these lists.

This report is written on the basis of experience in Calcutta during the months of September, October and November 1943, when acute or

sub-acute starvation was widely seen, and it is possible that in the future in different circumstances the situation may be rather different and demand rather different measures. It is however felt that these notes should be of general value.

Types of cases.—One feature noted in Calcutta is the relative rarity of marked signs of vitamin deficiency. Frank cases of beri-beri, scurvy, etc., have not been seen. It seems, however, possible or probable that in more chronic starvation these vitamin deficiency diseases will be more common, and also that, unless the vitamin intake is adequate, the patients will develop these diseases during or after the treatment for sub-acute starvation.

The cases admitted to hospital from the 'sick destitutes' found on the streets of Calcutta could be divided roughly into three groups: (*a*) those suffering from inanition due to starvation only, (*b*) those suffering from inanition due to a combination of starvation and disease, and (*c*) those showing relatively little inanition but suffering from acute disease. The methods of handling and management of these groups of cases therefore differ somewhat.

Diagnosis.—The diagnosis of inanition is comparatively easy. The patient is usually very thin and weak and shows the characteristic mental picture of inanition, often a marked apathy. The skin is dry and cold, all the organs and tissues are shrunken, the subcutaneous fat is completely absent, the temperature is subnormal, systolic, diastolic and pulse pressures are reduced. The eyes are shrunken and there are frequently other signs of dehydration. Often the wasting of the limbs is masked by the presence of œdema. (Care should be taken to make sure that this is not caused by nephritis.) There is sometimes present a diarrhœa and colitis which may be neither bacillary nor amœbic.

The diagnosis in patients of the second group, those showing inanition plus disease, is often more difficult. The predominating clinical picture is that of inanition, and moreover the presence of disease may be completely masked by the inanition. The patients will frequently show malaria parasites in the blood, but have no temperature and show no splenic enlargement.

Similarly in the presence of an infection which commonly causes high fever, the temperature may be subnormal, apparently as the result of inanition. In the same way, cases of amœbic dysentery may show little diarrhœa and stools not typical of the disease. Such patients are frequently admitted to hospital and treated for inanition, and when the general condition begins to improve they develop the fever and other symptoms which are characteristic of the infection from which they are also suffering.

The diagnosis in patients of the third group presents no particular feature. The patients, though weak, are usually not collapsed, the pulse is good though often rapid, the body temperature is frequently raised, and the patients show the typical manifestations of the diseases from which they are suffering. The common diseases found have been malaria mostly malignant, dysentery sometimes amœbic but more often bacillary, pneumonia, nephritis, bronchitis, 'Naga sore', tuberculosis, anæmia, urinary tract infections, etc.

Treatment, general.—If the predominating clinical picture is that of disease, then the emphasis should be laid on treatment for that disease, but if, as is usual, the predominating clinical picture is that of inanition, then the inanition should be treated first. Many of the patients have been exposed to cold and have little or no clothing, and a good supply of clothing, blankets and bedding is essential. The treatment of inanition and of the diseases frequently found in these 'sick destitutes' is described below.

Dosage of drugs.—In considering the treatment of these patients it should be remembered that the body-weight of most of them is abnormally low, and also that they are usually very weak. The dosage of drugs therefore has to be planned accordingly. In general, the ordinary standard dosage of any drug should be halved, and this principle has been adopted throughout these notes.

Treatment, dietetic.—Diet treatment in disease superimposed on starvation is important. A healthy person suffering from acute infection may require little diet during treatment, since he has adequate reserves. A starved person suffering from acute infection has no reserves, and the diet must be kept at the maximum possible level. Only in inanition and severe gastro-intestinal disorders should the diet be markedly restricted and then only for the minimum possible time. A highly nutritious fluid diet is of vital importance in this work.

Inanition

A considerable number of patients may be brought to hospital in a state of collapse.

Treatment of collapse.—The general treatment for collapse should be adopted—rest, warmth, warm fluids, etc., followed by a suitable diet, but in severe cases intravenous therapy is strongly indicated and special preparations of protein hydrolysates containing vitamin B complex with glucose are being made available. If this is not available, or is contraindicated, 5 per cent glucose saline may be given.

Intravenous peptone glucose.—Intravenous injections of peptone glucose are recommended for all advanced cases of starvation in a state of collapse. (Cases of group I and sometimes of group II *vide infra.*) The injections help to revive the cases quickly and enable them to take suitable diet by the mouth.

Peptone glucose for injection is supplied in screw-capped transfusion bottles. It is a mixture of 5 per cent glucose, 5 per cent protein hydrolysates and contains riboflavine, nicotinic acid and thiamin. It is of a clear port-wine colour, free from precipitate or turbidity. Every batch before issue is tested bacteriologically for sterility, immunologically for freedom from allergic reactions, and pharmacologically for absence of toxicity.

The quantity contained in each bottle is usually 200 c.cm., which represents the average dose for one injection for an adult. Bottles containing 400 c.cm. are also supplied.

The bottles are best stored in the dark in a cupboard at room temperature. Storage tends to deepen the colour but this is of no consequence. Bottles showing precipitate or turbidity or giving out a foul odour on opening should be rejected. On opening the screw caps of good bottles, a noise is heard due to the rushing of air into the vacuumized bottles; when the caps are found loose, it is best to reject the bottles. Once the cap is opened, the material must be injected within 2 hours, as otherwise bacterial contamination and growth will occur.

Selection of cases.—Before giving injection to a patient, it is advisable to examine the urine for albumin and casts, but this is not absolutely essential. Even where no urine is available or where the patient is in an extreme state of collapse or the urine shows traces of albumin (as most cases of advanced starvation do), peptone glucose may be safely administered. But if there is general œdema, and if kidney and liver damage is suspected, it will probably be advisable to adopt other methods of treatment.

Nutritional œdema cases may improve markedly after peptone-glucose injection.

Technique.—The intravenous injections are best given with the help of Haye's pattern transfusion set (figure 1). The screw cap of the bottle is removed and the cork of the transfusion set (previously washed and sterilized) fitted on to the bottle. The bottle is inverted and hung up, and the clamps on the rubber tubing adjusted till the fluid comes out in drops (60 per minute) from the needle. The latter is then introduced into the vein and the fluid allowed to go in slowly. An injection of 200 c.cm. should take an hour to administer. Rapid administration may not be tolerated well. 400 c.cm. is the maximum daily dose. It may be given in one dose or preferably in two doses of 200 c.cm. each, one in the morning and the other in the evening. The effect is often immediate and lasts about 24 hours. The cases generally need as many as three injections on 3 consecutive days. A total of 600 to 1,000 c.cm. in 3 days often results in marked improvement and should be supplemented by nasal feeding (*vide infra*) or by hospital diet by mouth as indicated. It is essential to remember that one injection provides only about 100 to 200 calories, and therefore as the patient improves it should be supplemented by proper diet. So far there has not been any necessity for giving injections for more than 3 days, but if required they may be continued for another 3 days with benefit.

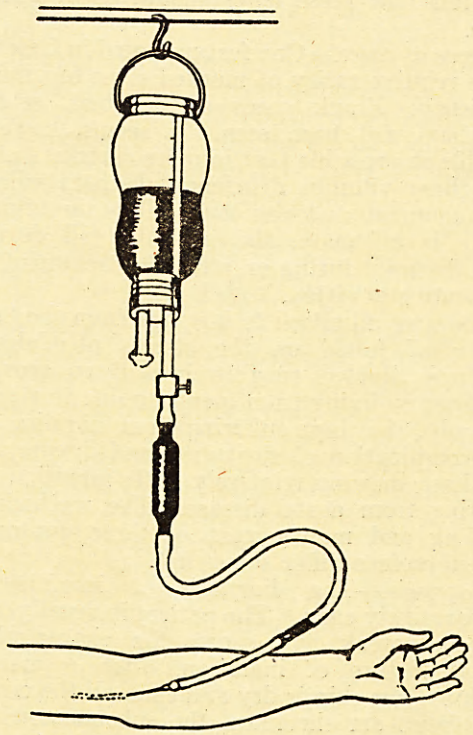

Fig. 1.—Haye's pattern intravenous transfusion technique.

Reactions.—In none of the cases so far injected has any adverse reaction been noted.* Improvement in the pulse, respiration, blood pressure and general condition usually follow the injection. In a few cases a latent malarial infection has flared up after one or more injections and prompt treatment with anti-malarial drugs has cured the disease.

Cleaning and sterilization.—After using the transfusion set, it should be immediately washed thoroughly in clean water and resterilized for use. This is important, as otherwise the fluid in the set may decompose with the formation of toxic substances which if not properly washed may give rise to untoward results.

Dietetic treatment

Selection of cases.—To simplify dietetic treatment, cases may be roughly categorized on admission as follows :—

Group I.—Collapsed cases, likely to die without parenteral feeding and therapy. These may be œdematous or severely dehydrated and are in the last stages of acute or chronic starvation. They are incapable of taking even simple liquid diet by ordinary methods of feeding, as they are usually semi-comatose.

*In a few more recent cases, mild reactions have been seen.—*Editor.*

Group II.—Less markedly collapsed cases, capable of recovery ordinarily by oral feeding. Anorexia and even failure of thirst may be present, so that individual spoon feeding may be necessary. Semi-solids and even milk may not be retained in the first day or two after admission.

Group III.—Cases capable of taking simple milk diet.

Group IV.—Cases usually capable of obtaining nourishment from a good gruel and likely to be able to look after themselves after a few days in hospital.

Treatment.—Treatment of group I patients by intravenous peptone glucose has already been discussed (*vide supra*). This should be supplemented by appropriate diet. Where necessary nasal feeding may be resorted to.

Nasal feeding.—In the treatment of cases of group II (and also in cases of group I during the phase of recovery) the administration of small amounts of food at very short intervals is needed. The following note describes one method of feeding such patients.

The apparatus used is the same as that for peptone glucose. A Ryle's tube is passed into

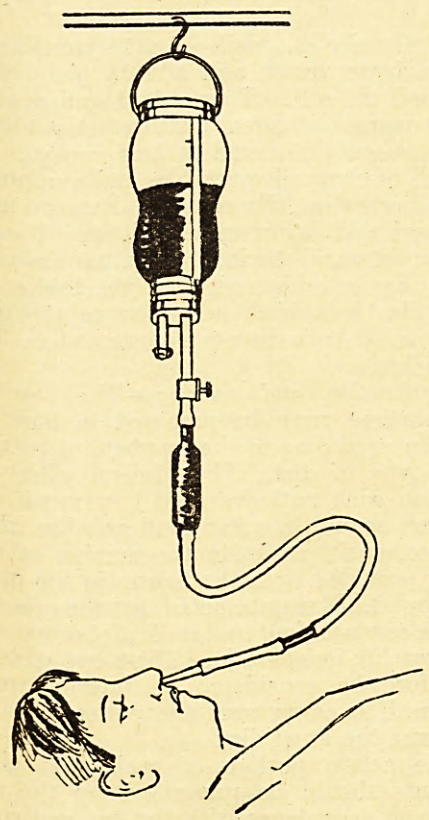

Fig. 2.—Nasal feeding through Ryle's tube.

the stomach by the nasal route attached to the adapter of the infusion apparatus and left in the stomach.

A suitable fluid for administration is as follows :—

	Calories	Protein grammes
Milk (skimmed or ghol), 4 pints	800	80
Glucose, 4 oz.	450	..
Salt, ¼ oz.	..	..
Eggs, 2	+ 120	10
Shark liver oil, ½ oz. ..	50	..
Compound vitamin tablet, 1	..	..
	1,420	90

Up to 4 pints can be given in a day which contains about 1,500 calories with 90 grammes protein and large quantities of all vitamins.

If liver is needed, 2 to 4 ounces of liver is pulped and sieved through muslin. One to 2 ounces of this pulp can be run down the stomach-tube twice daily, after disconnecting it temporarily from the drip apparatus, this adds a further 160 to 320 calories. The stomach-tube should be taken out and boiled every day when liver is administered.

Hospital diets.—A series of hospital diets roughly corresponding to the needs of cases in groups II, III and IV is given below. Each case may be put on the appropriate scale on admission and upgraded according to progress. The need for administering vitamin concentrates from the early stages is stressed.

It is evident that a somewhat crude and incomplete programme of hospital treatment will be necessary, if the small number of beds available is to be used to best advantage.

Cases in hospital should be upgraded as rapidly as progress permits in order that beds may be freed.

For simplicity in dietetic treatment, the hospital kitchen should prepare stocks of the various food mixtures according to the recipes given below, in quantities corresponding to the numbers of patients in each category. The medical officer could keep a card with each patient, stating his clinical group (changed according to progress) and the amounts of each mixture to be fed daily (adjusted in accordance with age and clinical condition). The work of actual feeding could thus be reduced to a drill. Caloric values for the standard diets and for half-pint quantities of the standard food mixtures are given to simplify caloric control. Adult patients should receive no less calories daily than those provided in each standard diet. Children should receive smaller portions in proportion to their size.

Ration scale.—The following ration scales are suggested as a basis for the bulk provision of food. They are designed for a unit of 10 'average' patients (including women and children) being fed daily. Provisionally it may be assumed that equal numbers of patients will require each type of diet.

Corresponding to clinical group	Daily scales of hospital rations per 10 patients					
	Fluid diet II		Milk diet III		Gruel diet IV	
	lb.	oz.	lb.	oz.	lb.	oz.
Flour (barley, rice or maida)	2	8	1	4	..	..
Sugar	2	8	2	8	2	8
Milk, fresh (tinned, dried or ghol) (*a*)	..	..	20	..	10	..
Cereal mixture (*b*) ..	..	..	..	..	6	..
Dhal	..	..	..	..	1	8
Vegetables (*c*)	..	..	..	..	2	8
Salt	..	5	..	5	..	5
Condiments	..	..	..	..	..	1
Compound vitamin tablets ..	(No)	10	(No)	10	(No)	10
Shark liver oil	..	½	..	½	..	½
Calories per head (approx.) ..	800		1,200		1,900	

Extras (per 10 patients).
(Admissible on demand, in addition to above diets if available.)

1. Yeast ..	5 oz.	6. Non-citrous fruits	1 lb.
2. Liver ..	1 lb.	7. Fresh fish ..	1 lb.
3. Onions ..	5 oz.	8. Glucose ..	1 lb.
4. Buttermilk (*a*) ..	8 oz.	9. Compound vitamin tablets.	
5. Citrous fruits ..	10	10. Shark liver oil.	

Notes.—(*a*) Buttermilk (ghol) is intended for use as a 'starter' for making curd, etc., from ordinary milk.

(*b*) Cereal mixture should contain not less than 50 per cent rice, the balance being made up from atta or maida flour as available. Millets should not be used in a hospital dietary.

(*c*) Vegetables should include 50 per cent green vegetables.

Standard recipes.—The following recipes give quantities for 10 average patients.

(*a*) *Fluid diet, conjee.*—Make 2½ pounds flour into a paste with water, and add water to make up 3 gallons. Bring to the boil and cook until a thin gruel is produced. When cool, add 2½ pounds sugar and 5 ounces salt and stir in. Shark liver oil 2½ and yeast 5 ounces may be added (approximate calorie value—150 per half pint).

Fruit drink.—If materials are available, make a drink from fruit juices, sugar (or glucose) and water.

(*b*) *Milk diet, conjee.*—May be prepared as above.

Milk.—If not tolerated, dilute with water as necessary. Two ounces of sugar should be added to each seer of milk. (Approximate calorie value of sweetened *undiluted* fresh milk or canned or dried milk diluted to fresh milk equivalence—220 per half pint.)

Ghol.—A portion of the milk available may be used to make 'ghol'. To each gallon of slightly warm fresh or diluted tinned or dried milk add 4 ounces of prepared buttermilk (*vide* extras no. 4). Stir and allow to stand overnight in a warm place. Next day churn up the curdled mass. (Approximate calorie value—200 per half pint.)

(*c*) *Gruel diet, gruel.*—Put 1½ pounds of dhal into a large vessel, and add 1½ pints of water and boil till soft. Then add 1 gallon of water and 6 pounds of cereal mixture. Again bring to boil. When the cereal is half cooked, add 2½ pounds of chopped vegetables and continue cooking till cereal is fully cooked. Remove from the fire and add 5 ounces of salt and 1 ounce of condiments, and stir in. (If onions are available they may be added with the vegetables. Sugar may also be added, according to the taste of patients.) Approximate calorie value—340 per half pint.

Preparation and serving.—The above food preparations may be prepared in bulk in the kitchen according to the numbers of patients on each type of diet. The medical officer should note on each patient's card how much of each mixture should be given, and at what intervals. He can easily estimate the number of calories being provided from the figures in the preceding paragraph. It may be noted that the *calorie value of the average fluid and milk diet is too small to support life indefinitely.* These two diets should therefore be considered as interim treatment designed to carry over the patient until fit to consume the gruel diet.

The actual portion of each food given to patients should be prescribed by the medical officer in accordance with the age and condition of each. The calorie intake should therefore be higher than 'average' for adults, and lower for children.

The importance in many cases of small frequent feeds has already been stressed.

Malaria

As already stated inanition may mask malarial infection, and the signs of malarial infection may not be present on admission, but fever, etc., may develop later. In areas in which malaria is highly endemic and in the malaria season, malaria may be so common as to justify *mass treatment* of all patients, but in other areas and even in highly endemic areas outside the malaria season, this will not be justified. In view of the shortage of quinine, accurate diagnosis of malaria is highly desirable and, if available, microscopic examination of blood films should be used. (Field's method of rapid staining is very useful in such circumstances, *vide* appendix II.*) Clinical diagnosis can be fairly accurate with experienced workers.

Malaria in starved or semi-starved persons is readily treated by ordinary methods, the dosage being regulated according to body-weights; *generally* 15 *grains, and not more than* 20 *grains, of quinine should be given in a day and treatment should be given for* 7 *days. Oral administration is usually effective.* For this purpose quinine sulphate (or cinchona febrifuge) is recommended.

In severe cases with vomiting or cerebral symptoms, intravenous injections are recommended but they should be given with great care. Not more than 5 grains should be injected and it should be dissolved in at least 20 c.cm. of distilled water and injection should take at least 10 minutes. Or preferably the quinine may be given in 200 c.cm. of glucose saline. Quinine bihydrochloride should be used for this purpose. As soon as possible, injections should be abandoned for oral administration.

It is not usually considered necessary to give quinine for more than 7 days. The routine use of pamaquine is not considered advisable. Atebrin or mepacrine in half the usual dosage may be used if quinine is not available. The full army course of malaria treatment, the 2, 5, 2, 5, treatment, is not considered necessary or advisable in these cases.

Pneumonia

Cases of pneumonia should be treated with M&B 693, 2 tablets at once and 1 four-hourly till the temperature falls; a four-day course is usually sufficient. Adequate fluids must be given. (Pneumonia may develop during the phase of recovery from inanition.)

Intestinal disorders

Acute purging, vomiting, etc., may be due to cholera, bacillary dysentery, or food poisoning. The more chronic diarrhœas may be due to bacillary dysentery, amœbic dysentery, or to 'famine diarrhœa'. The fulminant dysenteric attack should be treated along the same lines as cholera, and therefore differential diagnosis is unnecessary. Of the less acute conditions, bacillary dysentery is much more common than amœbic, and since microscopical examination will usually not be available, *dysenteries should be treated as bacillary unless there is a definite indication to the contrary* (*e.g.* absence of fever, character of stools, lack of response to the sulphonamides).

Bacillary dysentery.—This should be treated with sulphaguanidine, 3 grammes given at once and 1½ grammes given four-hourly; or by M&B 693, 2 tablets at once and 1 tablet four-hourly. Sulphaguanidine is less toxic but has no effect on the respiratory, urinary and other infections from which these patients are often suffering. M&B 693 is effective against all these, but is more toxic. An adequate intake of fluids is essential during its administration. Under either treatment the symptoms should abate within 24 to 48 hours and treatment for limited periods (4 days) is usually effective. If symptoms do not subside, the correctness of the diagnosis should be questioned.

Amœbic dysentery.—This should be treated with emetine, half-grain doses injected daily for 6 days. If the diagnosis is correct, diminution in symptoms should be observed by the third day.

Nutritional diarrhœa.—This is frequently seen and should be treated along dietetic lines.

Cholera.—Cholera cases should be isolated and treated along usual lines with the immediate rapid transfusion of up to 3 pints of hypertonic saline, followed if possible by slow drip feed, or repeated transfusions, of isotonic saline until the blood pressure shows a reasonable and maintained rise, and until the urine output average 6 ounces in 4 hours. If suppression of urine persists and signs of uræmia appear, hypotonic saline with alkalies should be given intravenously. As soon as possible a large intake of fluids by mouth should be established.

Œdema

Œdema is commonly seen among sick destitutes. There are two main causes: (*a*) nutritional œdema, (*b*) nephritis commonly secondary to septic skin conditions particularly scabies, and exposure to cold. In the cold weather the second group may predominate.

It is important to distinguish between the two types since *in the second type intravenous injection of saline and protein hydrolysate is absolutely contraindicated.*

Nutritional œdema is less extensive, and less marked. Albumin in the urine if present is very small in amount, and there are no casts, red cells, etc. In such cases *the blood pressure may be low,* the heart is weak but normal in action.

In nephritis the œdema may be very extensive and marked general anasarca, ascites, etc., are common, the urine usually shows albumin casts, red cells, etc. (though these may very occasionally be low or even absent), and *the*

*This information is given in our editorial (p. 73) and appendix II is omitted.—*Editor.*

blood pressure is not low, and in the acute cases seen here the heart has been normal. In similar cases reported elsewhere in Bengal cardiac complications have been reported.

In cases of nephritis, low diet, low-fluid intake, salt-free diet, etc., should be the treatment.

Anæmia

Some degree of anæmia, usually macrocytic, has been seen in 80 per cent of Calcutta cases and in some cases it has been very severe. Directly and indirectly anæmia may contribute to the death rate.

All patients in hospital should get some form of animal protein, at least 2 or 3 times a week, and except in cases of diarrhœa or dysentery, ferrous sulphate in doses of 3 to 6 grains should be given to all persons. Yeast may also be added to the diet with great advantage.

In all patients showing marked anæmia, treatment should be promptly instituted. Liver should be given, by injection 2 to 4 c.cm. daily up to 6 days, and this course should be repeated after two weeks. If adequate supplies of injectable liver products are not available, 100 to 200 grammes of liver, powder, liquid or lightly cooked, should be given daily for 7 to 10 days to the less severe cases of anæmias.

Anæmia associated with malaria will usually respond well to treatment for malaria which should therefore be given first. Later, if necessary, the anæmia should be treated. In very severe anæmia with malaria, treatment for the two conditions should be given.

Skin conditions

Ulcers.—Phagedenic ulcers, particularly 'Naga' sores, are very common in such patients. If untreated, the ulcers may extend deeply, affect bones and cause death. The general treatment consists of rest, good food and personal hygiene. The local treatment recommended is as follows :—

(*a*) The application twice a day of compresses consisting of saturated magnesium sulphate solution or a mixture of saturated magnesium sulphate and 1 in 2,500 potassium permanganate, equal parts. These applications are continued until the sloughs have separated.

(*b*) The ulcer is then dusted with boric powder containing 1 in 10 sulphanilamide powder. This dressing can, if necessary, be left for several days. The dressing is continued until the ulcer heals.

Scabies.—The patient is given a good wash with soap and warm water; the skin surface is scrubbed well with a hard brush or a rough towel; the wash is given preferably towards evening. The patient is then given a quantity of the ointment (unguentum sulphuris B.P. 1 dram to 1 ounce) sufficient to cover his whole body (about 3 ounces of ointment is required for one application for every adult); this he rubs in vigorously for 20 minutes to half an hour and then puts his clothes on and goes to bed.

This process is repeated for 3 consecutive nights and on the morning of the fifth day he gets a good bath and wears fresh clothes and the treatment is complete.

Any sores which are left after this treatment should have dilute ammoniated mercury ointment 1 per cent to apply daily.

APPENDIX I

LIST OF DRUGS, ETC., ISSUED TO HOSPITALS

'Acute' hospitals

Drugs	AMOUNTS FOR A FORTNIGHT: 20 bedded hospitals	50 bedded hospitals
1. Aspirin tablets 5 grains.	150 tablets	375 tablets
2. E.C. ..	2 bottles	5 bottles
3. Ferri sulph., 3-grain tablets.	200 tablets	500 tablets
4. Hypertonic saline tablets.		63 tablets
5. Inj. camphor in ether.	6 ampoules	15 ampoules
6. Inj. emetine ..	10 grains	25 grains
7. Inj. glucose saline, 5%.	20 pints	50 pints
8. Inj. quinine bihydrochlor.	12 ampoules	30 ampoules
9. Inj. morphine hydrochlor.	4½ grains	12 grains
10. Kaolin ..	2 lb.	5 lb.
11. Liq. paraffin ..	1 lb.	2 lb.
12. M&B 693 ..	150 tablets	375 tablets
13. Mag. sulph. ..	2 lb.	5 lb.
14. Pot. brom. ..	1 lb.	3 lb.
15. Pot. permanganas	¼ lb.	1 lb.
16. Quinine tablets ..	300 tablets	750 tablets
17. Sodi bicarb. ..	1 lb.	3 lb.
18. Sulphaguanidine	200 tablets	500 tablets
19. Sulphanilamide	500 tablets	750 tablets
20. Tr. iodine (methyl).	1 lb.	3 lb.
21. Vitamin tablets	1,000 tablets	2,500 tablets
22. Ung. hydrarg. ammon.	1 lb.	3 lb.
23. Ung. sulphur ..	1 lb.	3 lb.
24. Yeast or equivalent, *e.g.* marmite.	1,000 tablets	2,500 tablets
25. Zinc sulph. for eye drops.	1 oz.	2 oz.
Surgical		
1. Bandage ..	1 than	3 thans
2. Lint ..	1 lb.	3 lb.
3. Infusion apparatus	1	2
4. Wool ..	2 lb.	5 lb.
Disinfectants		
1. Bleaching powder	50 lb.	125 lb.
2. Soap ..	8 cakes	20 cakes

'Chronic' hospitals

Drugs	Amount for a fortnight for 50 beds
1. Acid boric—zinc-starch powder ..	2 lb.
2. Ammon. carb.	1 lb.
3. Aspirin (5-grain tablets) ..	350 tablets
4. Aqua dist. (double dist. for i.v. use)—ampoules of 5 c.c.	50 ampoules
5. Bismuth carb.	3 lb.
6. Calcium lactate	2 lb.
7 Carbon tetrachlor. ..	25 c.c.
8. Carbarsone tablets	150 tablets
9. Chloroform (pure) ..	1 lb.
10. Castor oil	10 oz.
11. Dettol	5 oz.

APPENDIX I—*concld.*

	Drugs	Amount for a fortnight for 50 beds
12.	Ext. ergot liquid	1 oz.
13.	Ext. kurchi	20 oz.
14.	Ether	1 lb.
15.	Ferri. sulph.	1 lb.
16.	Glucose pulv.	3 lb.
17.	Glycerine	2 oz.
18.	Gum acacia	10 oz.
19.	Hydrarg. subchlor.	1½ drams
20.	Hypertonic saline tablets	75 tablets
21.	Inj. atropine	1 tube
22.	Inj. calcium gluconate	10 ampoules
23.	Inj. camphor in ether	12 ampoules
24.	Inj. emetine	50 grains
25.	Inj. glucose saline, 5% solution	20 pints
26.	Inj. morphine sulph.	5 grains
27.	Inj. pituitrin	5 c.c.
28.	Inj. quinine bihydrochlor.	100 ampoules
29.	Kaolin	3 lb.
30.	Liq. arsenicalis	1 oz.
31.	Lysol	8 oz.
32.	M&B 693	600 tablets
33.	Mag. carb. Levis	2 lb.
34.	Mag. sulph.	5 lb.
35.	Phenol	1 oz.
36.	Pot. brom.	10 oz.
37.	Pot. citras	2 lb.
38.	Pot. iodide	2 lb.
39.	Pot. permanganas	3 oz.
40.	Protargol or argyrol	23 grains
41.	Quinine sulph., pulv.	2 lb.
42.	Quinine sulph., 5-grain tablets	1,400 tablets
43.	Santonini	2 oz.
44.	Sodi bicarb.	2 lb.
45.	Sodi chlor. tablets	50 tablets
46.	Sulphonamide tablets	600 tablets
47.	Sulphaguanidine tablets	600 tablets
48.	Spt. ammon. aromat.	2 oz.
49.	Spt. methylated	1 pint
50.	Spt. rectificatus	4 oz.
51.	Urea stibamine	10 grammes
52.	Tr. belladonna	2 oz.
53.	Tr. card. co.	2 oz.
54.	Tr. digitalis	2 oz.
55.	Tr. iodine (methyl)	½ lb.
56.	Tr. opii	2 oz.
57.	Ung. chrysophanic	1 lb.
58.	Ung. hydrarg. ammon.	2 lb.
59.	Ung. sulphuris	2 lb.
60.	Vin. ipecac.	1 lb.
61.	Vitamin tablets	1,500 tablets Ex-
62.	Yeast tablets (or solution)	1,500 tablets clude.
63.	E.C.	4 bottles
	Apparatus	
1.	Cholera apparatus	1
	Disinfectants	
1.	Bleaching powder	1 cwt.
2.	Carbolic, 5%	10 cakes

Medical News

SUPPLIES AND DISTRIBUTION OF PENICILLIN

(STATEMENT BY MEDICAL RESEARCH COUNCIL)

IT is now generally known in the profession, and even to some extent among the laity, that penicillin has remarkable therapeutic properties, and frequent inquiries are made about its availability. The following is a statement of the present position. In order to extend and amplify the pioneer work of Professor Fleming, and of Professor Florey and his colleagues at Oxford, the Medical Research Council, at the request of the Ministry of Supply, last March appointed a Committee on Clinical Trials of Penicillin, which controls the distribution of penicillin for purposes of clinical research, and is instructed to employ the present limited supplies to gain new knowledge of the curative possibilities of the drug rather than merely to repeat the therapeutic successes of which it is already known to be capable. In addition to a quantity allocated to the War Office for trial in wounds in the Army overseas, supplies of penicillin for research into the systemic treatment of selected infections have been allocated to four centres in this country; four others are receiving, or are about to receive, smaller supplies for the study of local treatment only. It has not seemed advisable at present that these centres should be made generally known, nor that an invitation should be issued to refer suitable cases to them, because the numbers of patients which can be dealt with are so limited that this could only cause widespread disappointment.

The policy of the therapeutic trials now proceeding is to treat conditions known to be susceptible only so far as is necessary to define the minimum effective dosage, the best methods of administration, and any factors not yet studied on which success may depend, and to explore the possibilities of penicillin treatment in conditions hitherto unstudied from this point of view. Penicillin is known to have an action on many species of bacteria, some of which cause a great variety of lesions; these, together with the many forms which an infected wound may take, afford a wide field of study.

Even with the fullest co-operation of the Ministry of Supply and of the manufacturing firms, the difficulties in making penicillin on a commercial scale are still so formidable that the present output in this country is scarcely sufficient for the work in the four main research centres, and is only a minute fraction of the quantity which would be required if all cases of even a few specified infections were to be afforded treatment. Production on a greatly increased scale is being urgently undertaken both here and in the United States, but in both countries the requirements of the fighting services are likely to absorb most of the output for some time to come, and to name a date when adequate supplies will be available for general use is at present impossible. For the reasons given above it will be appreciated that requests for supplies of penicillin for the treatment of individual patients cannot, under existing conditions, be met.

Abstracted from the *British Medical Journal*, 28th August, 1943.

BRITISH SURGEONS' VISIT TO U.S.S.R.

(IMPRESSIONS OF SOVIET MEDICAL ORGANIZATION)

THE four British surgeons, Surgeon Rear-Admiral G. Gordon-Taylor, consulting surgeon to the Royal Navy; Mr. E. Rock Carling, consultant adviser to the Ministry of Health, the Ministry of Home Security, and the Ministry of Pensions; Major-General D. C. Monro, consulting surgeon to the British Army (War Office); and Mr. R. W. Watson-Jones, civilian consultant in orthopædic surgery to the Royal Air Force, paid a three weeks' visit to Soviet Russia and inspected hospital arrangements as far forward as Vyazma on the Western front, visited the clearing field, and mobile hospitals, and inspected the medical institutes and depots in Moscow. They found the organization of Russian medical services excellent. In their surgical work the Soviet medical service, with some differences in detail, follows the same general principles as those accepted in British war surgery, and has reached the same conclusions. The Commissar in charge of the service stated that at the time of the last war the Russians realized that their arrangements were not as good as those of their allies and during the twenty-five years between the two wars they have set themselves to reach a standard of medical and surgical work which will bear comparison with that of any other belligerent country.