

The Antiseptic

Estd. 1904

A Monthly Journal of Medicine & Surgery

Published on the 15th of every Month

Edited by: Drs. U RAMA RAU & U. KRISHNA RAU, M.B., B.S.,

Asst. Editor: U VASUDEVA RAU, M.B., B.S.,

Editorial & Publishing Office: 323-24, Thambu Chetty St., Madras-1.

London: 24/27, High Holborn W.C. 1. Bombay: 10, Homji St. Calcutta: 31, Beck Bagan Row.

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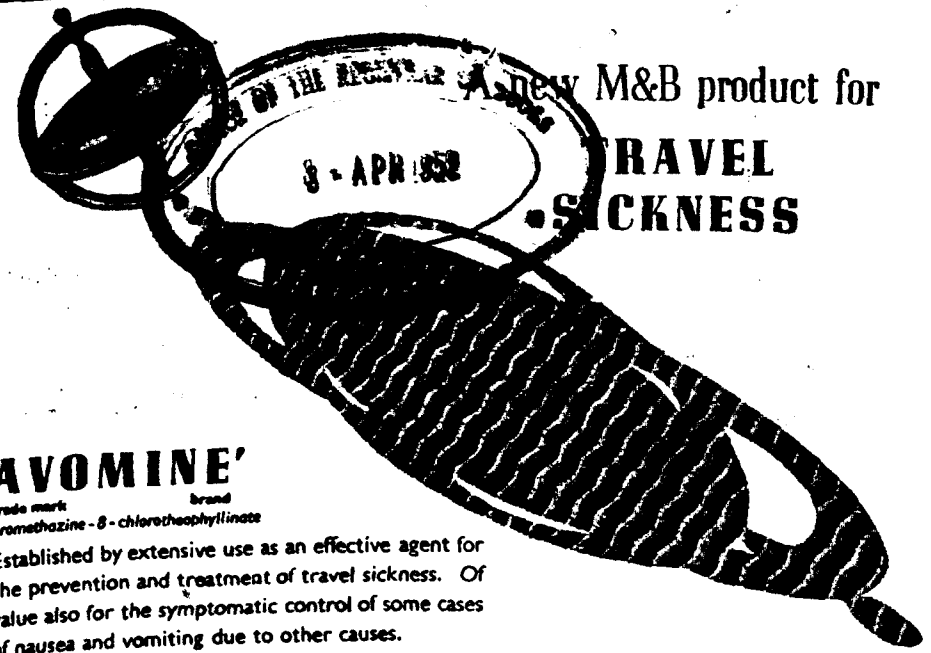
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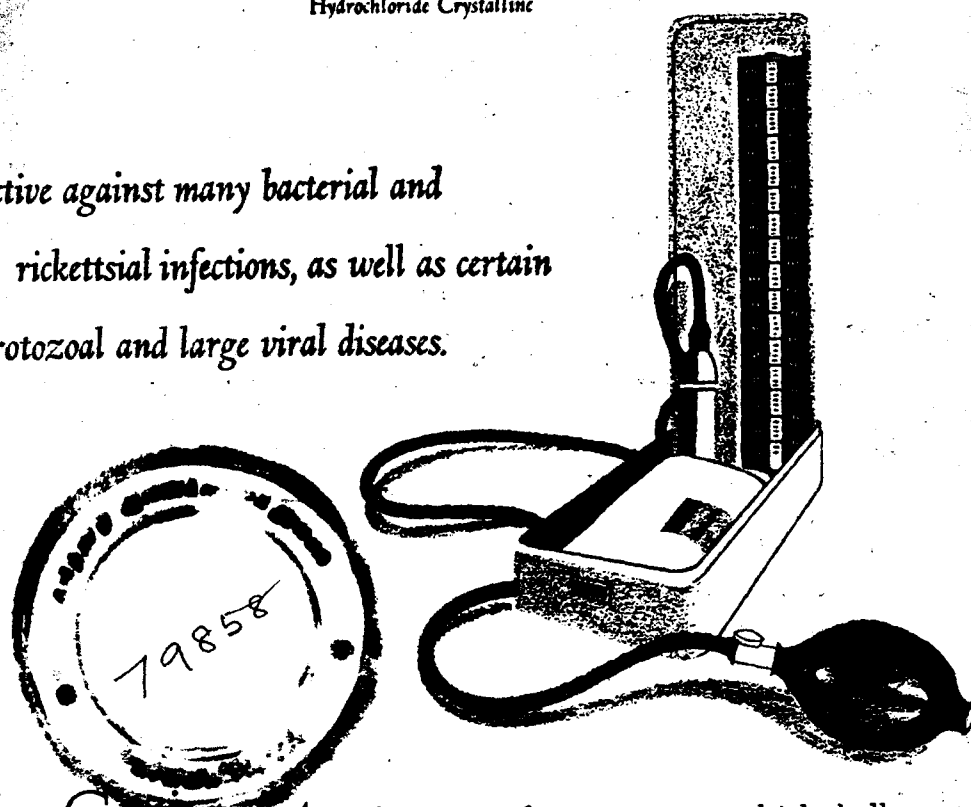
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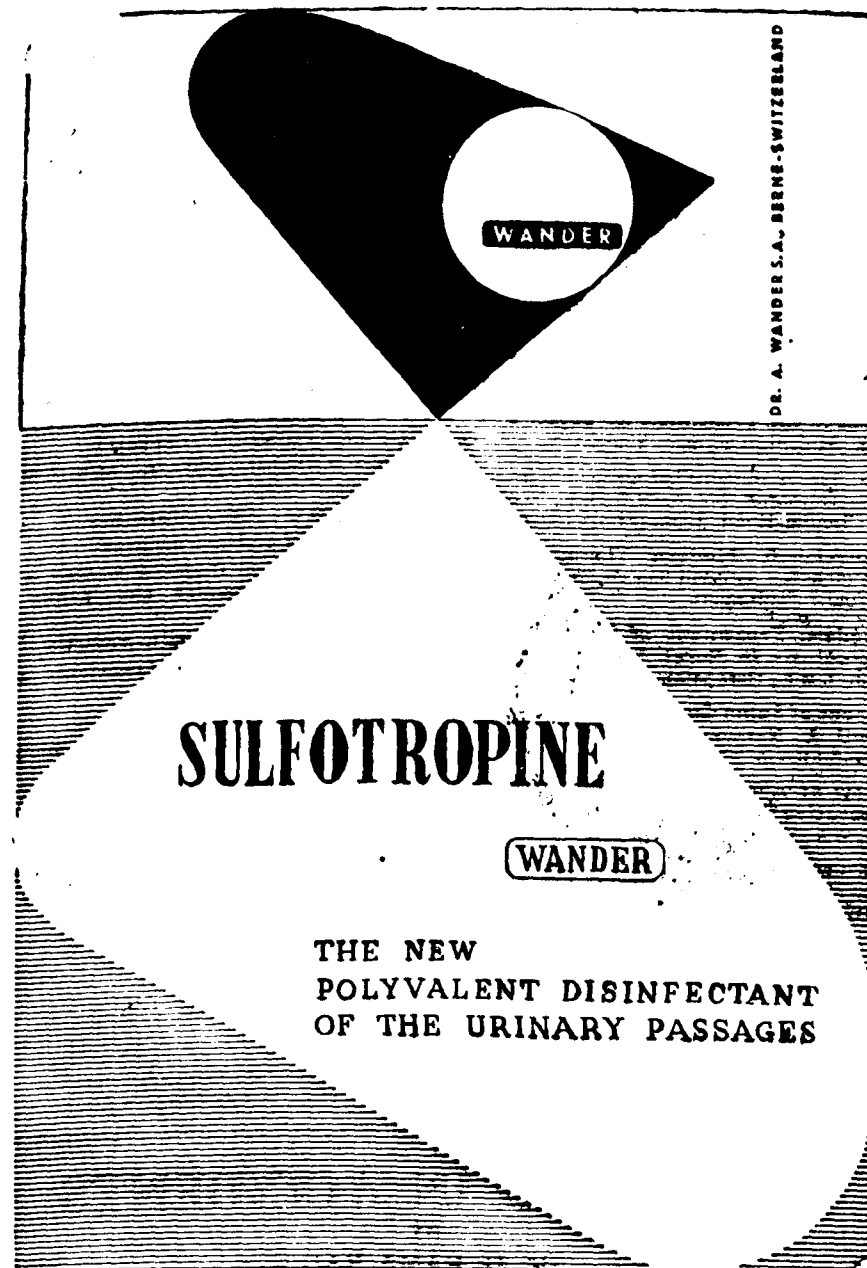
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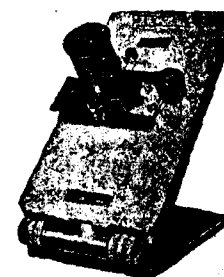
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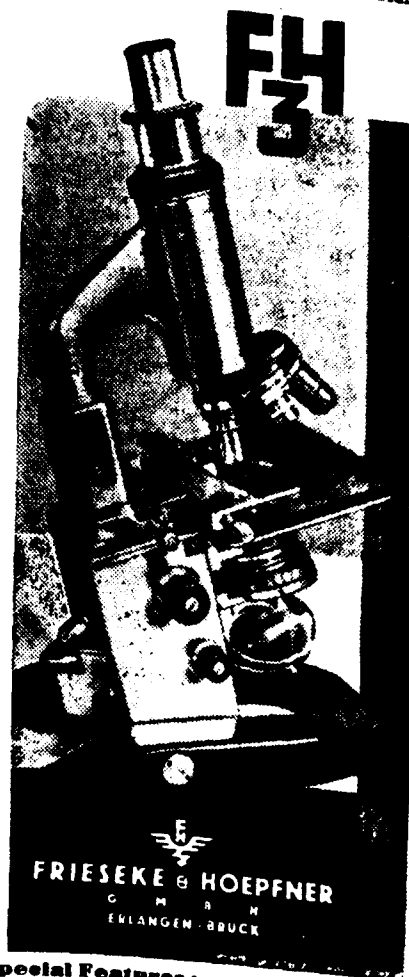
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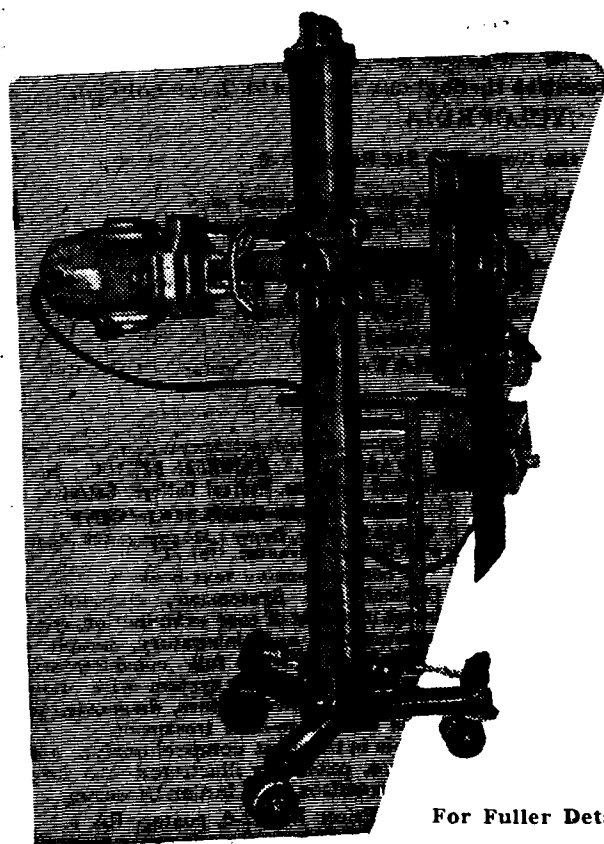
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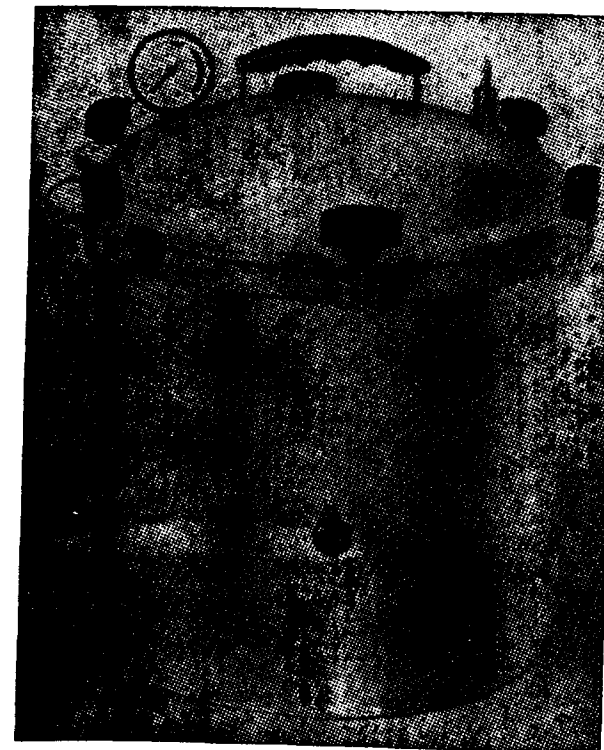
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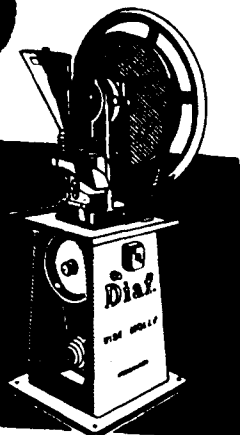
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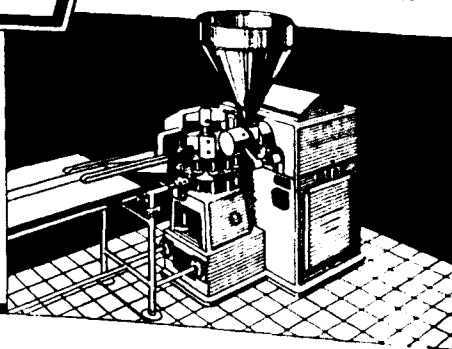
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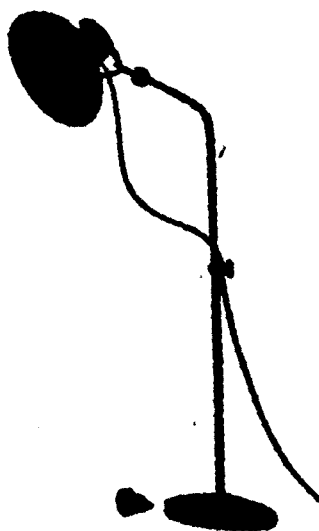
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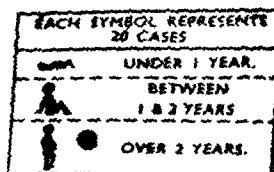
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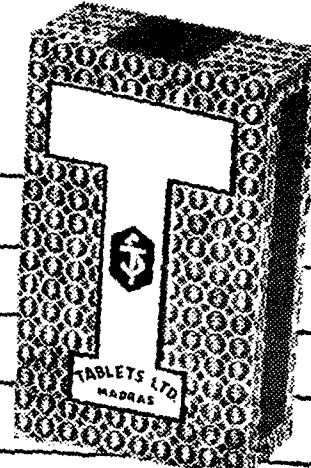
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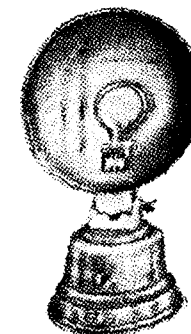
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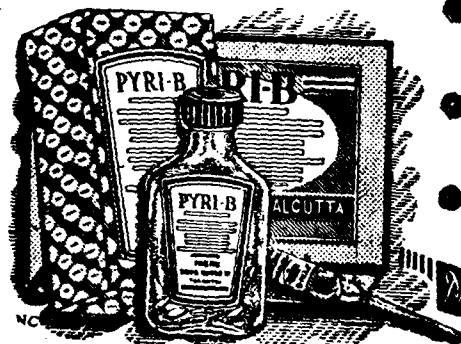
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Procureable everywhere from all the leading Chemists or apply to Manufacturers

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(Di-hydrostreptomycin
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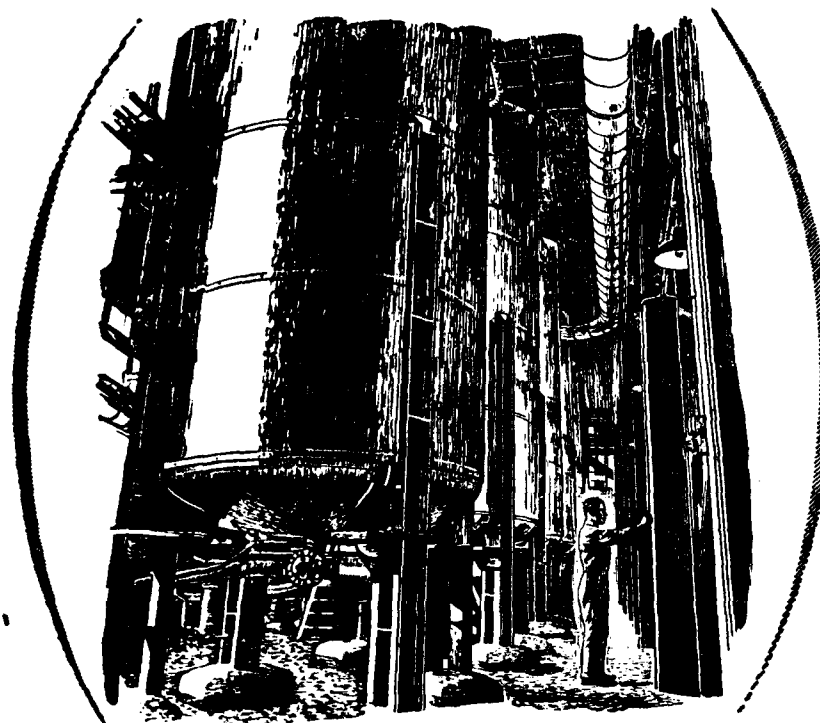


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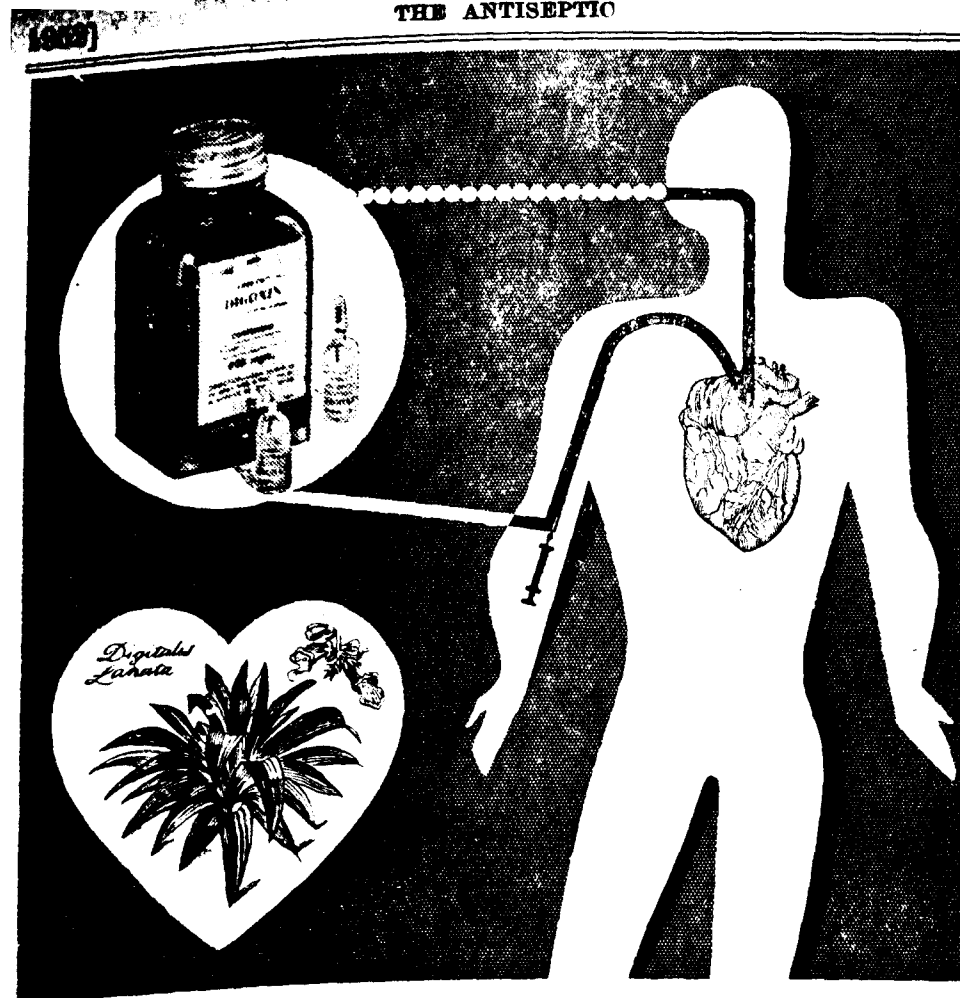
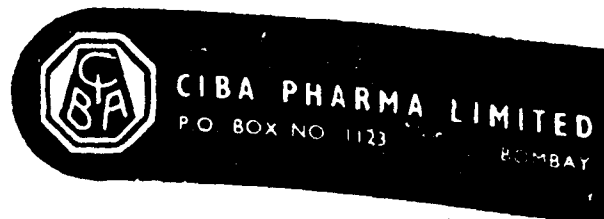
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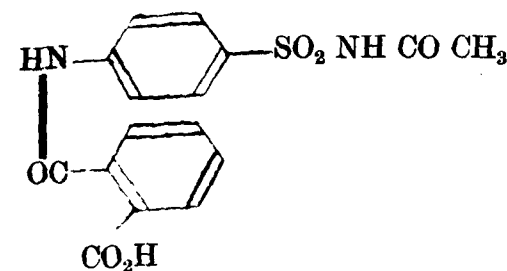
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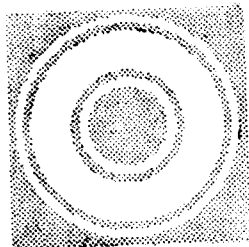
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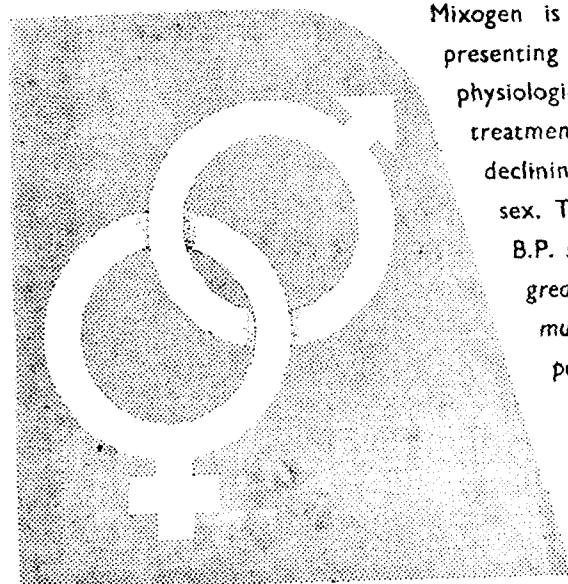
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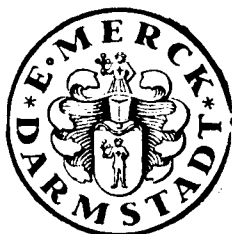


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ESTD. 1904

A Monthly Journal of Medicine and Surgery

Published on the 15th of every month.

Editors: U. RAMA RAU & U. KRISHNA RAU, M.B., B.S.

Asst. Editor: U. VASUDEVA RAU, M.B., B.S.

Editorial & Publishing Office:

"RAMARAU BUILDINGS," 323-24, Thambu Chetty St., Madras-1.

Annual Subscription: Rs. 7-8-0; Foreign—Rs. 10—Post Paid.

Vol. 49

MARCH, 1952

No. 3

MODERN THERAPY IN ANÆMIAS

DEEN DAYAL SRIVASTAVA, M.B., B.S.,

Medical Officer, Basoda (Madhya Bharat).

THE treatment of anæmias has undergone rapid and remarkable changes during the last ten years. Oral iron and liver therapy were formerly the sheet-anchor in antianæmic treatment. Therapeutically, anæmias fall into two groups:—(1) Microcytic, in which iron is the treatment of choice; and (2) Macrocytic where liver extracts are the chief curative agents. Both these types require however, supplementary factors to complete the treatment, viz., traces of Cu, Mn for the microcytic, and vitamin B complex and Vit. C for the macrocytic types. And, just as the ferrous form of iron is the most potent of all oral iron preparations the whole (crude) liver extract is the most powerful in parenteral liver therapy. Yet, "fresh blood is the best substitute for the lost blood," and it is really the whole blood only which can provide all the necessary erythropoietic elements—all in one.

A. Modern therapy in microcytic anæmias.—Iron is the specific ingredient of the drugs used in the treatment of the microcytic anæmias, and the addition of traces of certain inorganic elements like Cu, Mn, As, and Nickel potentiates the therapeutic activity of Iron. Iron when ingested is always absorbed in the ferrous form, from the 'acid-secreting area' of the upper third of the duodenum. Hence, Acid hydrochlor dil, should be administered orally at the same time, in order to enable the ferrous iron to be absorbed; in microcytic anæmias there may be either a deficient supply of iron or there may be deficient absorption of the suitable iron provided, owing to some disease in the 'acid-secreting

area' of the small intestine; and, secondly, enteric-coated iron preparations are therapeutically not sufficiently active as the coating is often poorly soluble in the acid and prevents the assimilation of the iron from the gut. There are numerous preparations of inorganic iron—both pharmacopoeial and patented. The common pharmacopoeial preparations of iron are:—*Ferri carbonas saccharatus* (dose 10–30 grains), *Ferri sulph* (dose 3–5 grains), *Ferri sulph exsiccatus* (dose 1–3 grains), and *Pilula Ferri carbonatis* or the Bland's pill (dose 5–30 grains). There is one other unofficial preparation of iron, viz., the citrated ferrous chloride (dose 3 grains, three or four times a day). Patent preparations containing inorganic iron are:—*Fersolate* (Glaxo), *Fersamin* (Altab Lab.), and *Ferilex* (T.C.F.). These iron preparations are given soon after food, in order to avoid gastric upsets; the constipating tendency of iron can be countered by the concurrent administration of mild aperients and vitamin B complex orally. Therapeutically, one tablet of *Fersolate* contains three grains of ferrous sulph along with minute traces of Cu sulph and of Mn sulph; so the 3 tablets are equal to 45 grains of Bland's pill and are equal to 90 grains of *ferri et ammon citras*. A prescription whereby iron can be dispensed conveniently is as follows:—

R Ferrous chloride	...	gr. iii
Acid hydrochlor dil	...	℥ xv
Liquor arsenic hydroch	...	℥ iii
Extract Cascara liquid	...	℥ xx
Glycerinum	...	℥ xv
Aqua pyrethris ad	...	℥ i

Mft. Mist. Sig.—One dose three times a day.

A new patent "Tonoferron" of the East India Pharmaceutical Works, Calcutta, is stated to contain iron, as colloidal iron hydroxide *plus* proteolysed liver extract, vitamin B complex and traces of Cu and Mn for oral medication.

Nissin in 1948 introduced the I.V. route for therapeutic administration of iron. He showed that whereas only 15 to 20 per cent of the iron administered orally is utilised, nearly 90 per cent. of the iron is utilised when given intravenously. The drawback lies in the serious and occasionally fatal side-effects which attend the I.V. iron-therapy. It has been observed that about 40 per cent of the patients receiving I.V. iron get side-reactions, which are:—

(1) Laboured breathing; (2) venous spasms; (3) diffuse headache; (4) generalised itching; and (5) sacral back-ache. And one must always be on the look-out for the onset of any of these manifestations; and when they appear, further injections should be stopped at once and a subcutaneous injection of fresh adrenalin 1 in 1000 immediately given. Moreover the safety margin of the I.V. iron is too narrow, and this route is to be preferred only when the indications for iron are urgent and quite evident. Iron on administration gets deposited in the liver, spleen and the bone-marrow, and therefore, any over-use might lead to the accumulation of iron in these

tissues and give rise to fibrosis and consequent degeneration and deranged function. However I.V. iron has however certain advantages, namely:—(a) Response in the rise of the Hb is very rapid and substantial; (b) gastro-intestinal disturbances such as dyspepsia and constipation are avoided; and (c) symptomatic relief occurs quite early i.e., the patient gets an increased feeling of well-being, the appetite improves, and the patient looks more cheerful and bright.

The form in which iron is given intravenously is a 2% stable solution of saccharated iron hydroxide, and two well-known preparations of I.V. iron are: (a) *Ferrivenin* (Evans); and (b) *Uniferrum* (Unichem Lab.) Their 5 c.c. ampoule is equal to 100 mgm. of iron (daily human requirement of iron is 10–15 mgm.), which when given I.V. will raise the Hb by about 4% (Haldane).

Some of the richest sources of organic iron in Nature are:—*Solanum tarvum*, bitter-gourd, *phyllanthus emblica*, apples, grapes, treacle (जड़), turmeric, protein-rich pulses, spinach, cabbage, and other fresh green leafy vegetables. And nature provides these articles of food with sufficient roughage to prevent the constipating tendency of the iron, present in them. Milk is poor in iron, though an ideal food in all other respects.

B. Modern therapy in macrocytic anæmias.—The eating of raw liver for the relief of 'weakness' is recorded even in the history of the ancient primitive races. But the scientific approach to liver therapy started in 1926 when Minot and Murphy explained the rationale underlying it. In the beginning whole liver was ingested as a therapeutic measure, and then liver soup was used for the purpose. Still later, oral liver therapy was replaced by parenteral administration. And, first whole (crude) liver extracts were injected, and later refined (purified) extracts came to be included in parenteral liver-therapy. Whole liver extracts are however, still preferred to the refined ones, because the former contain the so-far unidentified and unisolated factors, so very essential for adequate and complete erythropoiesis. Refined liver extracts of the 'campolon' or 'anhæmin' varieties are best suited for the treatment of true Addisonian anæmia. 'Purification' deprives the whole-liver extracts of their folic-acid content but not of the vitamin B₁₂ content. The discovery of folic acid and of vitamin B₁₂ is a really great advance made in the history of the vitamin B complex and more especially in our knowledge of the 'extrinsic' factor of Castle. Their inclusion in the anti-anæmic armamentarium is an important secondary event; it will open up a new field of research to determine the inter-relationships between the liver extracts and the vitamin B complex.

I. Folic Acid.—It is a member of the vitamin-B-complex, and is known by several names, such as, Vit. M, Vitamin B₉, *Lactobacillus casei* factor, Vitamin B₁₀ and B₁₁, and Eluate factor. Chemically, it is pteroylglutamic acid, a compound of patridine and

glutamic acid. It was first isolated from the green 'foliage' of spinach, and hence termed 'Folic acid'. Being a component of the vitamin B complex it occurs in Nature in all substances rich in pulses. Animal liver stores the extra unutilised vitamin B complex which the animals obtain from the plants they feed on.

Folic acid was first synthesized in 1945, by Angier and Boothe. Practically all forms of life need it. Its chief pharmacological action is "to bring that part of the alimentary tract to normal, which absorbs the 'inter-action product' formed by the union of the extrinsic and the intrinsic factors of Castle." It is this inter-action product which on absorption is transported via the portal blood to the liver, there to be transformed into the anti-anæmic principle (A.A.P.) and stored ready for use in an emergency.

The administration of Folic acid has, no effect on the neurological complications of P.A. but if anything, worsens the condition. Folic acid (F.A.) is available in 3 mg. tablets for oral therapy. Its I.M. dose is 5-10 mg. and it is never given by the I.V. route.

Folinic acids—a new group, also known as the Citrovorum factor, are probably co-enzymes of folic acid and are more complex than the folic acid itself. Folic acid is quite useful in the macrocytic anæmias of pregnancy and sprue and of infancy, where the lesion is in that part of the bowels which is concerned with the absorption of the 'inter-action product'; and, for this very reason vitamin B₁₂ is of no benefit in these cases. It is therefore, quite likely that "folic-acid is the representative of the extrinsic factor of Castle", and its claims for being the A.A.P. made by Zuelzer in 1946 are untenable in the light of the available evidence.

II. Vitamin B₁₂.—Its discovery was announced almost simultaneously in 1948, by Rickes in U.S.A. and by Smith in England. It is a cobalt-protein complex, and is present in all those natural sources which are rich in vitamin B complex namely, liver, yeast, green leafy vegetables, and certain pulses. Curiously enough, it also exists in the molds of the genus streptomyces, viz., Streptomyces griseus, and S. aureofaciens, in commercial sources of vitamin B₁₂—the respective sources of the Antibiotics, Streptomycin and Aureomycin. [This might lead to further discoveries regarding inter-relationships between Antibiotics and the Vitamin B complex.] About a year ago three sub-varieties of vitamin B₁₂ have been described—Vit. B_{12a}, Vit. B_{12b}, and Vit. B_{12c}. Vitamin B₁₂ and folic acid though occurring together in nature bear no mutual relationship. Vitamin B₁₂ probably functions in the biosynthesis of 'thymidine'—a powerful hæmatinic; and activated charcoal will adsorb vitamin B₁₂. Vitamin B₁₂ is especially indicated in the P.A. cases where neurological complications have set in. There are several patent preparations both foreign and Indian on the market. The following are some of them :—

(i) Rubramin (Squibb); (ii) Vibalt (Pfizer); (iii) Berubigen (Upjohn); (iv) Cobione (Merck); (v) Anacobin (B.D.H.); (vi) Cytamen (Glaxo); (vii) Normocytin (Lederle); (viii) Vitcobin (Fairdeal); (ix) Rubyvit (Chemo Pharma Lab); (x) Zibibar (Zandu Co.); (xi) Uni B₁₂ (Unichem); and (xii) Hepacobin (Eastern Drug Co.). The dose of vitamin B₁₂ is 30 mg. by I.M. injection; oral preparations of vitamin B₁₂ have been recently introduced but they are therapeutically weak.

Conclusion.—To the physician anæmia is a symptom-complex and not a disease *per se*. As such the treatment of anæmia is really the removal of the underlying cause. Most of the anæmias are treated by the administration of proteolysed liver, Fe with traces of Mn and Cu, vitamins B complex (including the newly discovered folic acid and vitamin B₁₂) and Vitamin C. "A doctor who treats a case of anæmia indiscriminately without ascertaining the exact type does more harm than good to the patient," says the *Lancet*.

Dr. Shyam Narain Mathur, M.B., B.S., Ph.D., Professor of Physiology, Medical College, Lucknow (U.P.), had prophesied as it were, the value of Cobalt as an hæmatinic, in his lecture on "The Evolution of Blood" delivered in 1947 at Agra; he foretold that in the course of further evolution, Fe is most likely to be replaced by cobalt, which has a greater aptitude for transporting oxygen from the inhaled air to the various tissues of the body, than iron. He emphasised that the disappearance of the nucleus in R.B.C. was the result of the specialised function it served in the human mechanism; and "for this very reason" said he, "the copper in the hæmoglobin of the blood of aquatic animals has been supplanted by the iron in the hæmoglobin of the blood in terrestrial beings." Cobalt-porphyrin is thus under a process of evolution. (*The blood-chemistry of the aerial animals should also be assessed in this direction*).

Lately, claims have been made by Erg and Wimmer that vitamin B₁₂ is the A.A.P. factor. But it is not so, for were it correct, vitamin B₁₂ should be able to cure P.A. acting as a specific like Quinine in malaria or Insulin in diabetes. Therefore, whenever there is a doubt as to whether folic acid or vitamin B₁₂ should be selected for the treatment of a case of macrocytic anæmia, the best course to adopt is to use "Whole liver extract supplemented by vitamin B complex and Vitamin C"—(T.C.F. Co.) by I.M. injections, and plastules with folic acid (John Wyeth and Co.) orally. There is "Biotose" of Ciba Co. containing whole liver, Vit. B complex and Vit. C, all in one, in capsule-form suitable for oral use. Similarly, Ferilex Liquid with vitamin B₁₂ of T.C.F. is also an ideal preparation for the treatment of microcytic anæmias. Vitamin C is also an important hæmatinic in anæmias, and probably plays some role in the genesis of R.B.C. precursors from the bone-marrow.

THE MODERN TREATMENT OF CONGESTIVE HEART FAILURE

M. ABDULLA, L.M.S., F.C.P.S.,

AND

D. K. ROHINI, L.M.P., L.C.O.,

The Nursing Home, Vaniyambadi, (North Arcot).

WITH the rapid strides made in all branches of science, including medicine during the past 50 years, considerable advance has been made in the diagnosis and treatment of cardiac diseases also.

Dock considers chronic heart failure as a "superb physiological response to stress due to man's wilful insistence on a perverted diet, rich in salt and his preference for the supine rather than the prone posture when at rest". It is simply the inability of the heart to pump the required quantity of blood regularly into the general vascular system.

In congestive heart failure the quantity of blood pumped during every contraction "Stroke volume" and per minute "Minute volume" is diminished and some of it is retained either in the right or in the left side of the heart or in both, resulting in stagnation which leads to an overloading in the general venous and pulmonary circuits. 'Overload' in the general venous circuit is due to the inefficiency of the left ventricle and that in the pulmonary circuit to inefficiency of the right.

Cardiac failure may be of two types:—(1) The congestive heart failure due entirely to the failure of the ventricles; and (2) heart failure due to the peripheral vascular failure as in shock (Bose). These two conditions require different treatments. In the latter condition the circulatory blood volume is diminished and the return of blood is low, due to stagnation or pooling of it in the capillary bed and in the numerous venules. The heart is not enlarged or engorged with blood. There is no dyspnoea or orthopnoea, nor any dependent oedema. The systolic pressure may be often normal but the diastolic pressure is constantly low. Digitalis which is the drug of choice in congestive heart failure, is useless and may even be harmful in this condition by slowing down the cardiac rate and decreasing the cardiac output.

The more recent concepts and theories on congestive heart failure have been reviewed briefly in order to make the review of the progress made in the treatment of this condition better understood.

The advances in the treatment of congestive heart failure may be reviewed under the following heads:—

- | | |
|-------------------------|---------------------------|
| I. Rest. | IV. Venesection and other |
| II. Specific treatment. | procedures. |
| III. Dietetic measures. | V. Oxygenation. |

I. Rest.—Most important of all is 'defensive rest', which should be a complete cessation of physical movement and of all mental excitement. Domestic, public and private business worries, must be banned. The least number of visitors may be allowed to see the patient, restricting it if possible only to personal friends. Rest minimises the expenditure of cardiac energy and builds up a myocardial reserve, that helps in relieving dyspnoea and oedema; it also reduces the cardiac rate considerably—even up to about 25,000 heart beats per day.

Some physicians, rigorously confine the patient to his bed without allowing any freedom of movement even to feed or wash himself without the help of a nurse. A special adjustable bed which would enable the patient to flex his legs and raise his head without any physical exertion on his part, is considered a necessity. This "complete rest in bed" was the universal rule till two years ago. But in 1949 Goodman and Wasserman strongly advocated the ambulation of cardiac patients, by permitting them to get up and attend to their personal needs such as dressing, shaving or feeding; they even allowed the use of a commode by such as do not care for the bed pan, if no definite contraindication such as pneumonia, pulmonary embolism or myocardial infarct, is present. They found that ambulatory patients did much better than bed-ridden ones. This has also been our own experience; our patients, most of whom come from the surrounding villages cannot for obvious reasons, be confined to bed. They will never use a bed pan, but will get out of their beds to squat. We found that these patients did better, than those who were rigorously confined to bed in hospital.

Clinical observations have shown that the average venous pressure of the confined patient with congestive heart failure, is much higher than the one who is ambulatory. The immobility would appear to favour oedema of the lungs and of the dependent parts and the infiltration of pathogens into the lungs as well.

Room:—The room should have the minimum of furniture, good ventilation and plenty of sunshine. The clothes should be light in the hot and warm in the cold weather. The nurse, when available, should be a trained hand, of a cheerful disposition, amiable in manners and quick to understand her patient. A good nurse is indeed a great asset.

Sleep:—In all cases of congestive heart failure when dyspnoea, restlessness, pericardial distress and anxiety are present, insomnia is usually always present. The patient should have atleast six hours of sleep in a day. When sleeplessness is a troublesome factor, Morphine $\frac{1}{6}$ — $\frac{1}{4}$ grain should be given subcutaneously. After one or two injections of Morphine, sedation can be maintained by the oral administration of 15 to 30 drops of 1% solution of Morphine sulphate (Bose). In severe oedema of the lungs and in Cheyne-Stokes respiration, morphia is contra-indicated, as it depresses the respiratory

centre, sometimes to a dangerous extent. Codeine is preferred by some as it has less disagreeable after-effects.

Other sedatives that are worthy of consideration are Phenobarbitone, Nembutol, Chloral hydras, Bromides, Paraldehyde, Hexabarbitone. Paraldehyde—the time honoured remedy, is best given in doses of a drachm or two in brandy with cracked ice. It is perhaps too early to evaluate the usefulness of Pethidine and Heptalgin, two new drugs which have lately come to be used in cardiac cases.

II. Specific treatment.—Digitalis is the drug of choice which has been extensively used. No other substitute of equal value has been found to replace it. Its tonic action on the failing heart is indisputable.

There are three principal glucosides derived from the leaves of *Digitalis purpurea*, namely, Digitoxin, Gitoxin, and Gitalin (Jacobs). From the leaves of *Digitalis lanata* (yellow foxglove) a white crystalline glucoside is isolated, namely Digoxin, which is now being widely used, as it gives the maximum benefit with the least toxic side-effects.

Gold has shown that among the different preparations of digitalis there is considerable difference in their rates of absorption. Only about 20% of *Digitalis* leaves and 10% of Lanatoside C given orally, are absorbed in the intestines, whereas 100% of Digoxin is absorbed. The tincture of *Digitalis* is not now very much used, as it loses potency on storing and is also unpalatable to the taste and difficult of accurate measurement in minims by the patient. *Digitalis* leaves, however, in powder form retain the potency for an indefinite period.

In mofussil stations the attending doctor is often forced to use any preparation available locally at the moment. A knowledge of the strengths of the various preparations is necessary so that he may know how much of Digoxin has been administered to the patient, when a change has to be made to another preparation, when a speedy action is required by intravenous injection or where combined intravenous and oral therapy is indicated.

Rapid digitalisation, when necessary, can safely be effected by the slow intravenous route (1.0 mg. of Digoxin with 10 c.c. of saline or glucose solution). The effect is noticed generally in an hour's time. The intravenous route is contraindicated when digitalis, strophanthus or quinidine had been administered within the previous fortnight. In very urgent cases, the treatment may be started by the intravenous route and continued by giving the remaining doses orally. Digitalis given intramuscularly or subcutaneously is liable to cause more pain and irritation and may sometimes produce an abscess.

Therapeutic action of digitalis:—Stoud states "Digitalis acts by virtue of its direct action on the myocardium and cardio-inhibitory

mechanism as a result of stimulation of the vagus centre in the medulla and direct action on the sino-auricular node, the auricular and ventricular muscles and the conduction pathway between the auricles and the ventricles". It slows the heart, lengthens the diastolic period and strengthens the contraction of the cardiac muscle. Consequently, the output of the heart is increased; the general circulation is improved and the kidneys secrete more freely.

The dosage of digitalis should not be calculated on the basis of body weight alone. We now know that an average patient of normal weight requires about 22 Cat units (C.U.) to obtain full therapeutic results. Very thin patients and elderly individuals need a smaller dose; an obese person weighing about 40 pounds more than the average would require about 50% more digitalis. Also the presence of an abnormal vagus-accelerator-balance with marked acceleration of the rate, such as are likely in fever, hyperthyroidism, neuro-circulatory asthenia and childhood, would perhaps require a relatively larger amount of digitalis, which would naturally narrow the margin of safety between therapeutic benefit and toxic effect (Stoud).

How digitalis acts is not clearly established. Some consider that it lowers the venous pressure thereby enabling the left heart to function better under a lowered pressure. Others think that it produces powerful contractions of the ventricles resulting in a "forward pressure." In the high-output-group as in emphysema, digitalis lowers the venous pressure and the out-put of the heart, just as in a normal heart and in venesection. Wood and Panlett found that with the administration of 1.5 mg. of Digoxin intravenously, the venous or the right auricular pressure fell sharply and considerably within half-an-hour while the cardiac-output and the blood-pressure rose and the pulse rate slowed down very much.

Harvey *et al* differed from this new view-point and stated that the predominantly venous action of Digoxin was not tenable in cases of left ventricular failure. Actually the improvement in the "stroke-volume" and the reduction in the pulmonary congestion in such cases suggested that the action of the drug was predominantly myocardial.

The "treatment of cardiac oedema" and "the forward circulatory and backward circulatory" theories have recently come in for a great deal of criticism and have been abandoned by some. The conception of congestive failure based on the weakness of the mechanical pump and pressure in the venous system is found inadequate. Catheterization of the right side of the heart has shown that under certain circumstances the cardiac output is increased even above the normal.

This traditional concept receives a rude shake, when we come to know the fact that mercurial diuretics and salt deprivation, restore circulatory equilibrium. Warren and Stead (1944) on the basis of carefully conducted tests found that salt and water retention was the

centre, sometimes to a dangerous extent. Codeine is preferred by some as it has less disagreeable after-effects.

Other sedatives that are worthy of consideration are Phenobarbitone, Nembutol, Chloral hydras, Bromides, Paraldehyde, Hexabarbitone. Paraldehyde—the time honoured remedy, is best given in doses of a drachm or two in brandy with cracked ice. It is perhaps too early to evaluate the usefulness of Pethidine and Heptalgin, two new drugs which have lately come to be used in cardiac cases.

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digitalis all the time to some extent. The maintenance dose of digitalis varies from patient to patient. Usually it is 1 C.U. per day—the total quantity being taken in divided doses.

The rate of elimination of digitalis varies in patients. Pardee showed that an average of 1.2 to 1.5 C.U. of digitalis is eliminated every day from the system. It is necessary therefore, to try at first a full maintenance dose of 1 C.U. per day and continue it for a few days and then decrease or increase it according to the toxic effects produced in the patient. The patient learns often to adjust the dosage himself. He should be advised to keep a daily record of the dosage, the heart rate at the apex, the radial pulse rate and also of any objective symptoms he may notice.

Other drugs of the digitalis series.—The next best drug in strophanthus. Strophanthus in the form of tincture and leaf is not generally used. The absorption by mouth and elimination of it from the system are slow and the results are quite doubtful. Strophanthine is the active principle and is usually given intravenously in grave emergencies, provided that no digitalis was given at least 48 hours prior to it. It is twice as powerful as digitalis. The effect by the intravenous route is more rapid and is noted in 5 to 15 minutes and is maintained for 12 to 24 hours. 1/10 mg. of Ouabin (Crystalline strophanthus) is equivalent to 1 C.U.

In emergency 1/2 mg. (1/120 grain) of Ouabin is given intravenously followed by 1/10 mg. every half hour until therapeutic or toxic effects become evident and thereafter a dose of 1/8 to 1/2 mg. may be given once every day or every two days as required.

The other preparations in this group Scilla, Convallaria and Apocyanum, have now become obsolete as they are all inferior to digitalis in action. Epinephrin and pituitrin have no specific value in congestive heart failure.

Xanthine groups.—These are of some special value. They are said to possess a dilating effect on the coronary vessels. Caffeine, Theophyllin, Theobromine are considered to be useful in toning the myocardium.

Aminophyllin otherwise known as Theophyllin-ethylene-diamine belongs to the Xanthine group and has a decided place in the treatment of congestive heart failure. It is a non-toxic and non-mercurial diuretic which has no known contraindications. It is readily absorbed and easily eliminated by the kidneys and by virtue of its powerful diuretic action, aids in the removal of oedematous fluid. It is well tolerated and easily administered. Aminophyllin is primarily a selective vaso-dilator of the coronary arteries. It increases the coronary out-put by about 80% as against only 40% by Theobromine and 41% by caffeine. As a result the myocardium receives more blood for itself and improves in tone. Its effect is so great that it is stated to "empty all the veins and fill up all the

arteries." It displaces fluid and chlorides from the tissues towards the blood stream and counteracts the constricting effect of blood vessels produced by digitalis.

Best results are obtained by the intravenous use of Aminophyllin in 0.25 gm. dosage. It is also used by mouth in 0.5 to 0.75 gm. and intramuscularly in 0.5 gm. dosage. It could also be given per rectum in the form of a suppository. A combination of both Digitalis and Aminophyllin in the form of a tablet has been found very useful as a maintenance dose. Afdigyl, otherwise called Digicardine, a combination of Digoxin 0.05 mg. and Aminophyllin 50.0 mg. is a useful preparation.

Mercurial diuretics.—They are undoubtedly powerful diuretics. Mercury was the time-honoured diuretic given in the form of Calomel in 1 to 2 grains doses or in the form of a blue pill. The results were doubtful and the side-effects disastrous, some of them being stomatitis, glossitis, gingivitis, diarrhoea, anuria (as a result of tubular damage of the kidneys) and dermatitis. Saxl and Heilig introduced in 1920 Merbaphen or Novasurol, a mercurial preparation administered by injection. In 1924 Brunn introduced a less toxic preparation in the form of Mersalyl or Salyrgan and in 1928 Issekutz and Vegh brought in Novurit or Mercuperin (a mercury and theophyllin compound). Quite recently Mercuhydrin and Mercuzanthine have been introduced and they are said to be decidedly better than all the previous ones. Recently Theomerin has been very much to the fore, as it can be administered both intravenously and subcutaneously. The other preparations have given cause in some cases to anxiety, and even deaths have occasionally been reported from their use. Shaffer *et al* reported that Mercuhydrin along with ascorbic acid had a very powerful diuretic action. 1 to 3 tablets a day each containing 60 mg. of Mercuhydrin and 100 mg. of ascorbic acid were found effective and safe even when continued for 18 months. They further reported that "with a restricted sodium diet, Aminophyllin and Mercuhydrin along with 500 mg. of ascorbic acid intravenously, resulted in effecting a loss of 10 pounds in weight, with the disappearance of the signs of left-sided failure and a reduction in blood pressure".

Some patients who are susceptible to mercury react very badly to these drugs. Mercurial diuretics are contraindicated when renal albuminuria is present, as they may produce renal failure. But the mere presence of albumin and a few hyaline cells in the urine of a patient with congestive heart, should not deter one from using mercurial diuretics as and when necessary. The specific gravity of the urine is of some help in guiding the general practitioner. Anything over 1.015 is indicative of primary cardiac failure. Mercurials should be given in the morning. If given late in the evening they are liable to keep the patient awake due to the resultant polyuria. It is advisable to give a trial dose of $\frac{1}{4}$ c.c. at first and if

no complications are noticed, larger doses may be administered. The injection is best given deep down into the gluteal muscle. It has little effect if given in the waterlogged parts.

Thiomerin which is one of the latest drugs has the advantage of being non-inflammatory in the parts given and painless even if given subcutaneously. Its action is said to be prolonged and to last sometimes for even more than 48 hours.

Since xanthines promote diuresis through an increase in glomerular filtration and the mercurials through diminution of tubular reabsorption, a combination of these two groups is logically sound and clinically advantageous. The diuretic action is further augmented by the administration of ammonium chloride or nitrate in a dosage of 90 to 150 grains a day. Enteric coated tablets are to be preferred as they do not produce nausea and gastritis.

Parathyroid extract has been found of use in general oedema associated with disturbances of the kidney. Vitamins B and B Complex have also been used by some but the rationale behind it is not yet well understood.

Quinidine.—This is one of the useful drugs discovered accidentally by Wenckebach. He found that quinidine had the property of regularising the irregular heart, lengthening the refractory period of the heart muscle; and checking and slowing down the conduction of cardiac impulses. It has also its limitations.

The auricular fibrillation and flutter were stated to be due to a circus movement of impulses in the auricles at a rate of 300 to 600 a minute, travelling around the mouths of the venæ cavæ. This circus-movement-theory was advanced by Sir Thomas Lewis in 1920. Quite recently in 1951, Prinzmetal *et al* showed it to be untenable. The anti-fibrillary action of quinidine is due to the ability to slow the rate of discharge from an ectopic focus on the auricles and consequently to mitigate the conduction failure induced by the rapid auricular rate.

The following is the routine adopted for quinidine treatment:—On the 1st day 0.2 gm. (3 grains) are given twice at 4 hourly intervals. This is the trial dose. On the 2nd day the dose is increased to 0.3 gm. (5 grains) three times a day and on the 3rd day 0.4 gm. and on the 4th day 0.5 gm. three times a day are given increasing the dose by 0.1 gm. a day till the desired effect is had.

The toxic symptoms produced by quinidine are:—tinnitus, rash, diarrhoea, vomiting, syncope, etc.

III. Dietetic measures.—The diet should be light and should contain plenty of carbohydrates, less of protein and sufficient fat to maintain the caloric energy and body weight. Large meals, more especially of farinaceous night meals should be avoided. They are liable to embarrass the heart either by a disturbance in the

gastro-intestinal-cardiac reflex or abdominal distension. Foods which tend to produce flatulence should be avoided—*e.g.*, beans, cabbage, cauliflower, Indian corn, onions; fruits like apples, mangoes, and water melon; sweets and jams, cheese and nuts, meat-soup and carbonated waters; coffee and highly sweetened sherbets and all greasy foods.

Restriction of salt:—This is very important and so has to be dealt with at some length.

It was long believed that the oedema in congestive heart failure was due to: (1) Avidity of the tissues; (2) a renal break-down and blockade; (3) venous backward pressure; and (4) hypoproteinemia. But these theories were discarded early in this century.

It was noticed that patients with a low or with no salt in their diet fared better and the oedema subsided much earlier. When the salt in the diet was resumed the oedema increased and so also the other distressing symptoms, (Karell 1860; Strauss, 1903; Widai and Lemierre, 1903; Finsen, 1904; and quite recently Levine Nielson *et al* 1951; Warren, and Stead.)

The restriction of water in an oedematous patient is an age-old practice. The result of such a restriction was not at all convincing or satisfactory. Wheeler and his associates and Bridges and White (1947) pointed out that the oedema in congestive heart failure was entirely due to the retention of sodium salt. They therefore, restricted the salt intake to 1 to 2 grams a day.

After the advent of the powerful mercurial diuretics, some relaxation was made in the intake of the salt (Lewiss, 1933; Levine, 1940; and White, 1947). But after the end of the last war there was a reversion to the strict restriction of salt (Schroeder, 1941; White *et al*, 1946; and Warren and Stead, 1940).

Gorham and his associates in 1948 pointed out in an unpublished article entitled "The relative importance of dietary sodium chloride and water intake in cardiac oedema", that with the low salt diet the diuresis was enhanced by increasing the intake of fluids up to 3 litres a day and any quantity more than that did not affect the increase of diuresis.

Levine *et al* (1951) demonstrated that with the aid of the mercurial and xanthine diuretics a large amount of sodium salt could be extracted from the system, amounting to about 20 gm. or more in 24 hours.

Schroeder (1941) had pointed out that a decrease in the consumption of salt to an amount less than the salt content of the urine, always decreased the oedema. He suggested that no more than 1 gm. of salt should be allowed on the plate as the food already contained some amount of it. This was indeed a wise suggestion.

Whilst carrying out the "low-salt" campaign it should be distinctly remembered that the salt-depletion from the blood, if in

excess of requirements would result in the "low salt syndrome". This syndrome is usually unrecognised unless carefully looked for. The successive depression of urinary volume in 3 to 5 days, rapid increase in weight, less of urinary chloride in the urine, elevation of non-protein content in the blood, fall in the plasma levels of chlorides and sodium, and occasionally increase in the cardiac rate are the cardinal points to be looked for by the physician. The common symptoms complained of by the patient are drowsiness, weakness, lethargy, anorexia, thirst, nausea, vomiting, abdominal and other muscular pains and cramps. A prompt and adequate replacement of salt will often avert an otherwise fatal outcome.

VI. Venesection and other procedures.—*Southey's tubes.*—These were once applied when mechanical aid was needed for the removal of the oedematous fluid. The tubes were inserted subcutaneously with all aseptic care. But even a little sepsis produced bad results. Several hundred c.cs. of fluid could be easily drained off by this method. These tubes are now obsolete.

Tourniquets.—When there is a severe right ventricular failure and phlebotomy is considered unwise or impracticable, the arresting of venous blood in the limbs is sometimes resorted to. Tourniquets are applied to all the four limbs and a pressure of 40 to 50 mm. of mercury is maintained sufficiently long to arrest only the venous but permit the arterial flow. The pressure may be maintained from half an hour to several hours; but every 15 minutes one limb is released and the pressure applied on the other limb. In this way each limb gets a rest for about 45 to 60 minutes.

Phlebotomy.—This is a useful procedure when used at the right moment. In fact it is a life saving measure, and is indicated in the failure of the right heart when the veins are full and over-loaded as indicated by the distension of veins in the neck; liver enlarged and tender; and cyanosis and pulmonary oedema are present. Phlebotomy should be performed by a large bore needle and about 400 to 700 c.c. of blood, withdrawn in about 10 to 15 minutes. In congestive heart failure the total volume of blood in the body is increased, in certain cases up to five or even six or seven litres. This is very common in congestive heart failure. As the condition of the patient improves the quantity of the blood decreases. How it decreases, has not been explained as yet.

Another interesting fact in congestive heart failure is an increase in the red blood cell formation as noticed by the reticulosis; with the improvement of the case there is a diminution in the blood formation and an increase in the blood destruction which in some cases produces slight jaundice. The icterus index may increase to as high as 20 to 30 or more. The other causes that are likely to produce jaundice are: (a) Passive congestion and anoxæmia of the liver which may impair liver function and disturb the bile

productive function ; and (b) pulmonary infarct and breaking down of the red blood cells.

The common serious sequelæ found are :

(1) The accumulation of fluid in the serous cavities such as the pleural and abdominal cavities. This fluid should be removed by paracentesis. Sometimes a change for the better is noticed after this simple procedure.

(2) The inflammation of the lungs due to intercurrent infection. Fever and leucocytosis are commonly found. An increase in the temperature to about 100°F is commonly observed in congestion of the lungs but any temperature above it should be viewed with suspicion. Pneumonia is the common infection. In such cases treatment should be resorted to immediately with antibiotics such as, penicillin and aureomycin. Concentration of penicillin in the blood for all the 24 hours should be maintained. Garrod has shown in the following table the blood level concentration maintained with various doses at different intervals. It is very useful in general practice where the facilities of a well-equipped laboratory are not readily available.

Dose.	Interval hours.
25,000 Units of (Penicillin aqueous)	3 hours
50,000 " "	4 hours
100,000 " "	6 hours
250,000 " "	8 hours
500,000 " "	12 hours

Aqueous procaine penicillin, an improvement on the plain penicillin, could be given once or twice a day. Aureomycin is another antibiotic very useful in pneumonia. It could be given by the mouth, the oral dose being 500 mg. three or four times a day.

In congestive heart-failure frequent bouts of irritable cough is a common feature. Though it is a minor symptom it has a great bearing on the general improvement of the patient. This cough produces a vicious circle in increasing the return flow of blood to the already over-burdened right ventricle. The same is true in hyperventilation or agitated breathing as in dyspnoea, orthopnoea or Cheyne-Stoke's respiration. The greater the congestion in the lungs the more the stimulus to the respiratory nerve centre. This vicious circle could be ended by diminishing the volume of the blood in the right ventricle by seating the patient with his legs hanging down or better still by doing phlebotomy. In ordinary cases morphia or codeine is of great help.

V. Oxygenation.—Normally we breathe in and out 10 litres of air per minute which contains 2 litres of oxygen. In the lungs the "alveolar pressure" is 100 mm. of mercury. Lack of oxygen raises the sensitivity of the respiratory centre to carbon dioxide and produces hyperapnoea, vomiting, muscular weakness, cyanosis

and even unconsciousness. This is due to the lack of oxygen in the brain.

There are 4 clinical types of Anoxia, namely :—

(1) *Anoxic* :—Here the tension of oxygen in the arterial blood is low and consequently the blood is poor in oxygen as in pneumonia, pulmonary oedema, massive collapse of the lungs and severe congestion of the lungs.

(2) *Stagnant* :—Here the process of oxygenation is normal but the oxygen-supply to the tissues is inadequate owing to the poor circulation, as in shock and heart-block failure.

(3) *Anæmic* :—In this condition the hæmoglobin is diminished.

(4) *Histotoxic* :—Here the tissue cells are incapacitated due to pathological changes and are therefore, unable to utilise the oxygen as in cyanide poisoning, etc.

In cases of pneumonia and heart failure due to pulmonary oedema, coronary infarct and chronic heart failure due to pulmonary diseases, oxygen has proved its value. In such emergencies such as shock due to coronary thrombosis or infarct it should be given in a concentration of 90% or more, the duration being limited to about 12 hours or at the most about a day. High concentrations of oxygen (anything above 75%) produce irritation of the mucous membrane and damage the pulmonary epithelium.

The gas must be allowed to flow more than 5 to 6 litres per minute in order to get a concentration of 40 to 45%. The oxygen tent is a cumbersome and costly affair. It is made of a fabric supported on a wire frame. The carbon dioxide and the vapour that accumulate inside should be removed by soda-lime. It is suitable only for children. The B.L.B. rubber masks are a modern contrivance and are ideal for use anywhere and at any time. In these the gas i.e., oxygen is delivered into a bag from which the patient inhales. The exhaled air escapes through the side valves. With it a concentration of about 90% gas could be maintained. In emergencies a high concentration upto 75% may be started and continued for 12 hours and then reduced to 50 to 60% depending on the condition of the patient.

Summary.—The progress in the cardiovascular field during the last decade and more particularly in the forties of this century is specially noteworthy.

During the beginning of the decade the importance of disturbed renal function became quite evident and later on, the theory of "Retention of sodium salts by the kidneys", exploded Starling's concept of "Cardiac oedema". The secondary increase in the blood volume became an established fact.

In the treatment of cardiac failure the notable improvements effected are: (1) The more rational and better development of

purified glucosides of digitalis which are completely absorbed by the alimentary system and which produce the minimum toxic side-effects. No other drug has as yet been found to replace digitalis. It still holds the place of pride and importance in the treatment of cardiac failure.

(2) The xanthine and mercurial diuretics have proved their value in eliminating oedematous fluid and chlorides which no other drug hitherto known had been able to do so well. Recent advances in their production have made them the drugs of choice, as they give the maximum results with the minimum toxic effects.

(3) The additive effects of ascorbic acid and ammonium salts, in enhancing the diuresis, produced by xanthine and mercurial diuretics have been recorded.

(4) The prevention of toxic effects of digitalis by the administration of potassium salts has been noted.

(5) The usefulness of oxygen therapy with the latest B.L.B. masks using a certain concentration has been made evident.

(6) The beneficial effects of ambulation as against the complete rest in bed for the patient have been emphasised.

(7) Restricting intake of sodium salt to 1 to 2 gm. and ingestion of fluids more than 3 litres per day now constitute the recognised practice.

There are now fewer deaths due to "congestive heart failure" than in any other period in the history of medicine. Our "heart cases" can now enjoy a cheerful and useful life, as well as any other man, though with a little care, restraint and caution.

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DIARRHOEA IN CHILDREN*

(Causes, pathogenesis, and general survey of the problem)

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THIS discussion will cover the whole age-period which begins with birth and is antecedent to adolescence, (age 0 to 14 years).

The term diarrhoea is easy to define. It indicates a symptom with a combination of two features, viz., lessened consistency and increased frequency of the stools. Either of these can exist in the absence of the other; but a single character of the stool,—lessened consistency or increased frequency,—cannot constitute diarrhoea. It is known that in certain conditions increased frequency alone exists, e.g., fragmentary constipation. Decreased consistency likewise may be observed by itself.

Aetiology and mechanism.—In the causation of diarrhoea, diseases of the gastro-intestinal tract play as important a part as conditions arising outside this tract. Stimulation of the bowels leading to increased peristalsis is the important event in the production of diarrhoea. The stimulation may be of the small bowel or of the large bowel or of both. They may happen even in the absence of anatomical lesions in the intestine, at any rate during its onset. With this stimulation, the bowel contents may reach the colon, preventing absorption in the small intestine and/or causing a greater pouring of fluid from the blood into the bowel.

Incidentally the greater stimulation of the small intestine tends to produce stools with an acid reaction. These stools contain undigested food particles; mucus if present is intimately mixed up with the contents and the bile pigments present are in an unreduced state. The diarrhoea originating in the large intestine on the other hand, produces alkaline stools; the food is well digested; the mucus is free and the bile is reduced.

Diarrhoea occurs in a multitude of conditions; it is a symptom present in various diseased states. It is customary to attempt a classification of all these conditions; yet it must be admitted that a satisfactory classification is difficult to make. The intestinal bacterial flora are not easy of interpretation; much less can these be correlated with any precision to the clinical manifestations to enable one to achieve a classification based on bacteriological studies only. Reviewing the morbid anatomy of the bowel in diarrhoea one will rarely find a situation more promising than the above. Leaving aside the specific lesions as in amoebic and bacillary dysenteries, enteric fever, cholera etc., the lesions in the bowel in the acute forms are phases of inflammation with a non-specific character. In

*From the opening paper in the symposium on the subject read at the XXVII All-Indian Medical Conference at Sholapur in December 1950.

the chronic forms, the morbid anatomy of the bowel alone is such as would fill in a whole volume.

The simplest classification then, would be from a clinical point of view, paying attention to the onset and the duration of the symptom. This will give us two large groups:—(1) Acute diarrhoeas; and (2) Chronic diarrhoeas.

From the point of view of pathogenesis two ill-defined groups may be described: (a) simple diarrhoea and; (b) toxic diarrhoeas and diarrhoeas in intoxications and infections.

As regards the age of the patient very useful groups can be made,—e.g., diarrhoeas of the new born, diarrhoeas of the infant, diarrhoeas in children under two, diarrhoeas under six weeks etc. This grouping is of immense practical value.

It must however be admitted that even using as our basis of classification, a combination of all the above points of view a comprehensive plan that would meet all conditions is next to impossible.

Predisposing causes.—A number of conditions are presumed to predispose to diarrhoea:—

(1) Heat.—It is a common experience that hot weather and a warm climate often predispose to diarrhoea, whether associated with toxic conditions or not.

(2) As regards the sexes diarrhoea occurs with equal frequency in both the sexes.

(3) Age plays a prominent part. Severe diarrhoeas occur in the early years, especially the first two.

(4) Individual peculiarities have been noted just as in the case of many other symptoms. Certain children are more susceptible and one attack greatly weakens the resistance of the tissues of the bowel resulting in greater liability to recurring attacks.

(5) Social and economic conditions play a very large part. Diarrhoeas occur more frequently in the children of the poor. Poverty carries with it numerous concomitant evils, e.g., overcrowding, bad ventilation, unclean homes, unsuitable foods, inadequate and unclean milk etc. It is no wonder that diarrhoea occurs in nearly 100 per cent of the inmates of institutions and homes for children which are run with small funds and the minimum of care and attention.

(6) Kershaw (1947) drew attention to local chilling as one of the causative factors in acute non-specific diarrhoea and dysentery in infants. This may serve as a non-specific determining cause.

Acute diarrhoea in general classification.—Of the many classifications one may attempt, the one into acute and chronic is what can reasonably be discussed with some degree of precision.

Acute diarrhoea is a result of enteritis of a greater or a lesser degree. Improper food, toxins, mineral salts, some kinds of drugs, and bacteria are some of the many ætiological factors. Central or reflex stimulation of the bowel—due to nervous influences may lead to a frequency of stools, though there may not be pathological changes in the intestinal wall.

Acute diarrhoeas are generally caused at all ages, except in infancy by indiscretions in diet,—coarse food, improperly prepared food, insufficiently masticated food, food taken in too large quantities, food taken too hot or too cold, food spoiled chemically or bacteriologically. Acute diarrhoea may originate from ingested poisonous substances or drugs. Examples are—arsenic, mercury, mineral salts, alkalies, acids, etc., and drugs like jalap and senna. All these produce direct irritation of the intestinal wall. They are capable of producing severe catarrh and even follicular necrosis. Acute diarrhoeas also accompany several infectious diseases. Bacillary dysentery will rank as the foremost; cholera and typhoid can be separated as a group. But the diarrhoea as it accompanies infectious diseases like chicken-pox, measles, small-pox, influenza, and pneumonia form an interesting group for study. This is likely to occur as a result of the bacteria-laden contents of the oro-pharynx and upper respiratory tract, coupled with a lowered vitality.

A word may be said about the acute diarrhoea from nervous influences, the mechanism of which is far too complicated and difficult to detail in a short lecture. It may however, be stated that there is excessive stimulation of the nerves governing peristalsis and/or there is excessive pouring out of fluid in the intestinal tract, thus involving motor and secretory factors.

Diarrhoea of the new born and the infant.—In the acute diarrhoea of early life, nutrition, climate and age, jointly and severally play the most important role. Few causes beyond these can be mentioned with confidence. One group of diarrhoeas in infants has been a source of headache to the clinician and the public health worker alike. This group goes by various names, though summer diarrhoea is the one most often used. It is a condition of gastro-enteritis of acute origin, accompanied by vomiting. It is possibly due to a virus infection. It is now known that from 95 to 97 per cent of cases occur in bottle-fed infants.

The role of the intestinal bacterial flora in the causation of the disease in infants needs to be considered. In the breast-fed infants, the flora is relatively simple consisting largely of *Lactobacillus bifidus*. In the early weeks of life this bacillus constitutes 99 per cent of the total organisms in the fæces (Cruickshanks 1915.) In addition there may be a few enterococci and gram-negative coliform bacilli (Tissier and Dreyfuss 1925).

The intestinal flora of the bottle-fed-infants is not so simple, *L. bifidus* being uncommon. Another member of the same group

L. acidophilus is present in large numbers (Tissier 1900). Coliform bacilli, entero-cocci, gram-positive aerobic spore-bearing bacilli and anaerobic bacilli occur in abundance.

The bacterial flora of the grown-up child resembles more that of the adult, which is a highly complex one and not germane to the present issue.

Attempts by several workers to determine the bacterial origin of infantile diarrhoea (summer diarrhoea of infants) have consistently failed. Some consider that the diarrhoea syndrome can be explained on the basis of an invasion of the body by certain specific bacteria of the intestinal group.

Recent researches.—On the subject of diarrhoea in the new born a number of carefully controlled epidemiological, clinical, bacteriological and experimental studies have been made during recent years. Pappenheimer and Cheever (1948) studied the diarrhoeal diseases in suckling mice. In these histopathological studies they have described cytoplasmic inclusion-bodies in the intestinal epithelium in relation to the disease. This is a very interesting observation especially in the light of the following work in relation to human material. Light and Hodes (1949) carried out an interesting study on epidemic diarrhoea amongst infants under six weeks. They could not isolate any known diarrhoea-producing pathogens from the stools or the naso-pharyngeal washings. The inoculation of the stool and the naso-pharyngeal washings intra-nasally, intra-peritoneally and intracerebrally into mice, hamsters, guinea-pigs, rabbits, ferrets, cotton rats, and four-day-old kittens yielded only negative results. However, the inoculation experiments in calves gave interesting positive findings. Twenty c.c. of a bacteria-free filtrate (Seitz filtrate) were given intra-nasally to three-weeks-old quarantined calves. Two days after the inoculation mucoid diarrhoea started and it became bloody in a few days; on the 11th day the calf was almost prostrate and died on the 15th day.

The results of their experimental studies on the inoculation of 89 calves show that there was a 13 per cent mortality in the experimental animals. In the non-fatal cases the duration of the diarrhoea was from 17 to 21 days, and the calves were left debilitated. The convalescent calves were found to be immune to inoculation or to reinfection. The serum of these calves was able to neutralise the homologous infective agent. It was likewise observed by these workers that neutralising antibodies were found in the serum of convalescent babies.

Autopsy findings in the fatal calves were as under:—Oedema, hyperæmia, and hæmorrhage in the intestinal walls in all animals, mucus in the small and large bowel, definite ulceration of the large intestine in a few, slight broncho-pneumonia in one, a few sub-acute abscesses in the kidney in another. Inclusion-bodies in the epithelial cells were *not* demonstrated. The autopsy findings are

those of dehydration of 5 to 7 days' duration. The infective agent was studied by these workers in greater detail and found to be partially resistant to heat. It was completely inactivated by boiling for five minutes. It resisted heat of 70°C for 60 minutes. Prolonged drying or heating at 80°C, for one hour attenuated the infective agent. Inoculation into calves of the attenuated agent produced a modified mild form of the disease, *viz.*, a mild diarrhoea after a prolonged incubation period. Such a modified disease was followed by effective immunity.

Can one say that this work has the potentiality of solving a difficult problem?

I have detailed this work at some length on account of its importance. Taylor, Powell and Wright (1949) studied clinical material from six different epidemic outbreaks of diarrhoeas in the new-born. They were also unable to detect any known intestinal pathogenic bacterium. Their virus studies were also negative. They discovered a strain of *B. coli* (D. 433) in some cases.

In the combined studies made by several learned bodies in 28 outbreaks in New York (1949) 618 cases with 62 deaths were encountered between 1942 and 1947. The general conclusion of this study was that the condition was preventable to a certain extent by adopting greater care, greater cleanliness, and preventing visitors, etc.

Stern (1947) discussed the prevention of epidemic neo-natal diarrhoea. Wright and Wright (1946) give an account of diarrhoea and enteritis amongst infants in the London area during the period 1930—1938). Mukherjee (1947) published his observations on acute diarrhoea amongst infants during the summer months in Jamshedpur and its suburbs. The most outstanding work however appears to be that in relation to its virus origin. Pappenheimer and Cheever (1948) produced histological evidence of the virus origin of epidemic diarrhoea, in suckling mice. May be, there is a human parallel to this.

Biochemical studies of the blood, stools, urine and other body-fluids have an unquestionable value in planning treatment and assessing the clinical picture.

A survey of the causes.—Turning next to the problem of diarrhoeas in children of the higher-age groups, the pathogenesis of these approaches that of the adult.

It is possible to tabulate into groups the causes of diarrhoea:—

- (1) Gastrogenous due to disturbed gastric function.
- (2) Due to disturbed pancreatic function.
- (3) Due to disturbed liver function.
- (4) Due to disturbed endocrine function such as that of pancreas, suprarenal, the thyroid, etc.

- (5) Due to cardiac and renal conditions.
- (6) Due to nervous influences, such as anxiety, excitement organic nervous disease and the like.
- (7) Due to deficiency diseases (nutritional).
- (8) Due to disturbances of metabolism producing endogenous toxins.
- (9) Specific gastro-enteritis or enteritis,—viruses, amoebic protozoa, bacteria, bacillary, parasitic, helminthic, tuberculous, etc., or due to irritants, drugs, chemicals, etc.
- (10) Conditions arising out of acute infectious diseases.
- (11) Non-specific entero-colitis.
- (12) Some unexplained gastro-enteritis.

This list of causative factors is neither in the order of frequency nor in the order of importance. At best, it can claim completeness.

Chronic diarrhoeas in early life.—Diarrhoea is a symptom which may become chronic. The incidence of chronic conditions rises as one goes up in the age scale. The aetiological factors are about the same here as those in the acute forms, probably somewhat modified. The bacterial aspect, the parasitic and helminthic content and the nutrition of the child attain greater importance in the consideration of chronic diarrhoeas.

Conclusions.—Acute diarrhoea of children may be of bacillary helminthic or virus origin; it is the whole picture of the condition that really matters.

The picture of experimental work I have placed before you earlier in this paper indicates that the deaths in experimental animals were due to dehydration. I have on my record a total of about 300 autopsies in the age group 0 to 10. A fair number of these autopsies was on cases of enteritis or gastro-enteritis in infants about one year old. The autopsy picture in most is that of advanced dehydration showing the attendant morbid anatomy.

Some problems connected with diarrhoeas in early life are typically public health questions. In countries with greater financial resources and with a better public health organization than ours, neonatal diarrhoea and diarrhoea amongst infants have been controlled with a distinct lowering of the mortality. Let me repeat, some of these diarrhoeas if not all of them, are preventable.

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Incidence of Diabetic Retinopathy

The increased liability of diabetics to develop retinal vascular disease is well known. Dolger in 1947 reported that 100 per cent of 200 patients with diabetes up to 25 years' duration developed retinal hæmorrhages regardless of age of onset, severity of the disease, or method of treatment. For physician and patient alike it is important to determine if there is any causative relationship between the degree of control of the diabetes and the appearance and extent of retinal changes. It was to add further evidence on the subject that Spoont and his co-workers undertook a special study. “Good and poor control” was the criterion of classification used in assessing the extent of the retinal changes. Good control consisted of normal blood-sugar-values, minimal glycosuria, maintenance of ideal weight, and freedom from hypoglycæmic attacks. The patients should be symptom-free, maintain optimal weight, have an acetone-free urine on a dose of insulin, if necessary. The incidence of acidosis, extreme hyperglycæmia, hypercholesterolemia, and hepatomegaly were criteria of ‘poor control.’

The material used in this study by Spoont *et al.*, consisted of 50 patients in the diabetic and ophthalmological sections of the University Hospital in Pennsylvania. 25 of these were ‘poorly controlled cases’ and 25 were “good control” cases. 17 of the poorly controlled cases showed diabetic retinopathy while only 4 of the well controlled group of 25 had it.

The average age of the ‘poorly controlled group with retinopathy was 58 years and that of the ‘well controlled’ group with retinopathy was 54 years. There is therefore, a significantly greater incidence of retinal lesions in the group classed as ‘poorly controlled’ diabetic patients in this series as compared with the ‘well controlled’ group.—(*Am. J. Med. Sciences*, May 1951, pp. 490-494).

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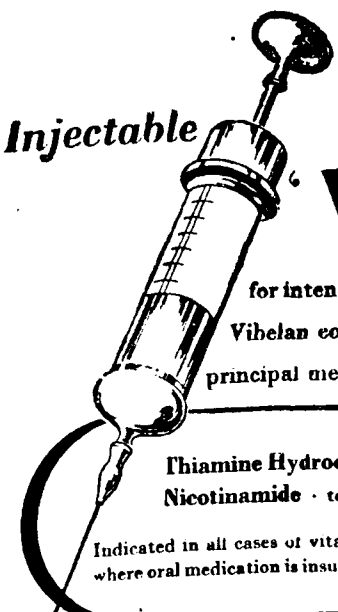
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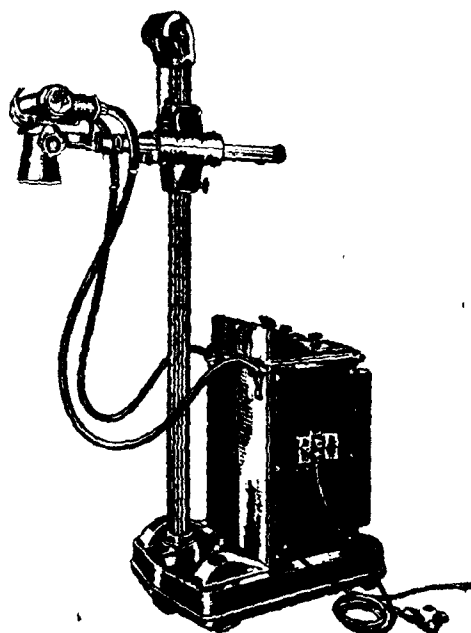
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TREATMENT OF ABORTION

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ABORTION is a fairly common occurrence, and it has been roughly estimated that 10 to 20% of all pregnancies end in spontaneous abortion. Of these about 80% occur during the second and third months of pregnancy. Germplasm deficiency accounts for a large number of early abortions. A careful study of the aborted products of conception has shown in 80 to 90% of these, a pathology incompatible with further development. Hence these were doomed at the very onset of the first sign of abortion and treatment would have been of no avail except perhaps to delay the process of expulsion.

A large number of women have slight bleeding in the early months of pregnancy probably due to the irrepressibility of the endometrial bleeding mechanism. This cannot be differentiated from threatened abortion. Such cases do not progress to abortion, even when no treatment is given.

Progesterone is the chief hormone which is concerned in preparing the nidation-bed for the fertilized egg and in ensuring its fixation during the early months of gestation. Progesterone is formed at first by the corpus luteum and there is a transfer of this function from the corpus luteum to the placenta in the third month of pregnancy. If the corpus luteum ceases to function before this time or if the placenta fails to take over the function owing to some abnormality, abortion will probably occur. In some cases of abortion the onset of symptoms is preceded by a fall in pregnanediol in the urine which indicates a lowered production of progesterone, as progesterone is excreted mainly as pregnanediol. In these cases it has often been found that the chorionic gonadotropin has persistently been below normal, showing that abnormality of gestation existed even before the onset of symptoms and so the treatment would not have prevented the abortion. In those cases where the gestation is normal as shown by the normal amount of chorionic gonadotropin, but the corpus luteum atrophies early (fall in pregnanediol) the temporary deficiency caused may lead to an abortion and these are the cases which may benefit by progesterone therapy.

The experience of animal breeders suggests that prolonged defective diet may so affect the vitality of the germ-cells that the products of conception will be able to attain only a certain stage of development before succumbing. It has been found that vitamin E is essential for the continuation of pregnancy in animals. There is no doubt that vitamin E is stored in the body and is rapidly removed during pregnancy and lactation. It is only with great difficulty that test animals are made vitamin-E-deficient. Since

vitamin E is widely distributed in nature, *e.g.*, in cereals, green vegetables and animal matter, a serious deficiency of E must be of rare occurrence. The ovum is an able parasite and can obtain what it requires from the mother even when the latter may show signs of vitamin deficiency.

Colvin reported 1570 cases of threatened abortion treated with only sedatives; abortion occurred in 28%. Of these 20.3% aborted blighted ova; 3.8% aborted due to pathology of the foetus, placenta or membranes; this clearly shows that treatment might have availed only in 3.9 per cent of these 1570 cases.

When called in to see a case of abortion, it is inadvisable to do a vaginal examination if the bleeding is slight because of the risk of aggravating the uterine contractions and inducing further bleeding. The patient should be put to bed and sedatives administered in order to ensure mental and physical rest. Injection of morphia ($\frac{1}{2}$ grain) is often useful and may be repeated if necessary. In early pregnancy morphia is stated to stimulate uterine contraction, but in practice this is not found to be so; very small doses probably produce contractions. Some obstetricians prefer barbiturates for sedation. The diet should be easily digestible. The bowels should be kept regular and when necessary, liquid paraffin or olive oil enema may be given.

It should be explained to the patient or her relatives that there is no means of knowing the state of the ovum in the early months of pregnancy; that if the foetus is already dead or developmentally defective, no amount of treatment will prevent the abortion from taking place; and that if, on the other hand, it is normal the only treatment necessary would be to try and prevent uterine contractions or arrest them if already started. For this purpose, rest both physical and mental, is essential.

In some cases with the above treatment the pain and bleeding stops and the pregnancy goes on to term. In others the threat may at any time become inevitable and in most of these the process of abortion proceeds naturally and terminates without any need for interference. Rarely however, the bleeding may become profuse in which case the uterus has to be evacuated. In still others even though the pain subsides bleeding continues. In view of the part played by developmental abnormalities of the foetus in the production of abortion, palliative treatment should not be continued unnecessarily long in these cases. If the symptoms do not disappear with 10 to 12 days, a vaginal examination should be made and the patient may be allowed to be up and about. If at any time, the bleeding becomes profuse the uterus should be emptied. Injection of Pituitrin $\frac{1}{2}$ c.c. repeated at intervals of 30 to 45 minutes up to six doses if necessary, often empties the uterus in these cases; if this fails, then the uterus will have to be evacuated by operation. In some cases slight bleeding may persist for a long

time, and one has to wait for several weeks to make sure that the foetus is dead. Once convinced that the foetus is dead, the uterus should be emptied.

The treatment of repeated abortions occurring in the early months of pregnancy is very unsatisfactory, as often no cause can be discovered. It is difficult to estimate the result of treatment in these cases because it has been found that even after repeated abortions a pregnancy often goes to term without any general or specific treatment. The haphazard use of expensive vitamin and endocrine products are not justified, as developmental defects are usually found in successive abortuses. Repeated abortions in the later months of pregnancy are mostly due to general diseases like syphilis, diabetes, nephritis, essential hypertension Rh factor etc.

When there is a history of repeated abortions, a careful examination must be made before allowing another pregnancy; the examination should include Wassermann test, urine examination, blood-pressure and Rh factor in both the husband and wife; the husband's seminal fluid should also be examined for any signs of defective spermatogenesis. Any defect found must be remedied.

In those cases where no cause can be discovered, certain general precautionary measures may help during pregnancy. The woman should be advised, to stay in bed at the time when her menstruation usually falls due to avoid marital relations entirely during the first four to five months, to avoid drastic purgatives but to keep the bowels regular and to avoid violent exercises. The diet should contain enough protein, carbohydrate, fat, minerals and vitamins. If progesterone deficiency is noticed, as shown by a normal chorionic gonadotropin with low pregnanediol excretion, progesterone 10mg. intramuscularly every 24 hours should be given. Where there are no facilities for hormone estimation, if there is a history of abortion occurring repeatedly towards the end of the third month, progesterone may be tried beginning about the 70th day of gestation and continuing till the 120th day. Some doctors have found desiccated thyroid $\frac{1}{2}$ to 2 grains a day useful, starting with a small dose, gradually increasing it to reach the maximum by the end of the third month, then reducing it slowly and stopping it completely by the eighth month.

Reference :

Colvin, E.D.—*Progress in Gynecology*, Vol. II of 1950, p. 356.

Obesity in Diabetes : Treatment with Anorexigenic Drugs

Osserman and Dolger found that 36 out of 55 obese diabetic patients showed significant loss of weight on low caloric diets aided by benzedrine (10 grains 3 times a day) and by dexedrine (10 grains 3 times a day) the latter being used only in hypertensive patients. Usually 1000 calories only were permitted. The weight losses varied from 11 to 77 lbs. Of 31 patients who used insulin, 15 were able to discontinue it and 11 were able to reduce the dose of insulin after weight-loss. No adverse effects were noted following the use of these anorexigenic drugs.—(*Ann. Int. Med.* 34-1-1951).

INTRAVENOUS IRON THERAPY

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IN a previous article, the author (Variava, 1943) indicated the role of iron in the treatment of anæmias. Oral administration was considered to be the best method of medication, as no parenteral product of therapeutic value had been discovered up to that time. Oral treatment with ferrous sulphate, or ferri et ammon. citrate in optimum doses was effective in the majority of cases of iron-deficiency anæmias. Its therapeutic efficiency could be enhanced by supplements of vitamins, or liver extract, oral or parenteral, and in severe cases by blood transfusions. There were very few cases which did not respond quickly to this treatment. A rise of Hb. on per cent a day was considered a satisfactory response. Thus, a patient rarely took more than six weeks to two months, to get his Hb. increase from 40 to 100%.

Iron was not given by injections, owing to the long duration of treatment, and the difficulty of giving adequate doses by this route (Witts, 1931). Iron parenterally in doses large enough to produce Hb. regeneration at an optimum rate, gave rise to toxic reactions (Goetsche *et al*, 1946). If the dosage at each injection was reduced in order to obviate these reactions, the injections had to be repeated very frequently. Even then response in Hb. rise was not the same, as was noticed in cases having oral iron therapy. The parenteral method was not advocated as a practical therapeutic measure and oral administration was preferred.

Since then the world has passed through an upheaval. Mass migrations of populations from one country to another have taken place in many parts of the world. Such migrations have been attended by serious privations, hardships, and diseases—factors which favour the development of anæmias. As a result, severe types of anæmia which were rare a decade ago, are now more frequently met with. Now-a-days it is common to see anæmia cases with R.B.C. counts below one million, and Hb. below 20%. It is noted that in the treatment of these severe cases of microcytic hypochromic anæmias, oral iron has not proved successful. The failure of oral-iron-therapy may be due to poor absorption from the gastro-intestinal tract, secondary to conditions like diarrhoea, dysentery, sprue, pellagra, etc. In many of these cases, large oral doses produce gastro-intestinal upsets, and the patient will not take iron by mouth. In a few instances, true intolerance to iron exists. Investigations with radio-active iron (Hahn-1949) indicate, that in severe cases of iron-deficiency anæmias, the only way to supply sufficient iron for metabolic activity, is the parenteral route. And so

far the intravenous route is the only method by which therapeutically efficient doses of iron can be administered in suitable quantity.

There is thus, undoubtedly a place in anti-anæmia treatment for an iron preparation that can be used by the intravenous route. Nissim (1947) found that saccharated iron-oxide intravenously is tolerated better than other forms. In this form, very large doses can be given without producing toxic reactions, and a rise of Hb. 1% a day can be satisfactorily obtained by properly adjusting the dosage. Another advantage of intravenous iron is that all the injected iron will be utilised in the body. This observation has subsequently been confirmed by a number of investigators *e.g.*, Slack and Wilkinson (1949). Goven and Scott (1949), and Nissim and Robson (1949). These studies have shown that of a large number of different compounds tested for therapeutic activity and toxicity, the saccharated iron oxide is the most potent, possessing the least toxic effects.

Indications.—In previous articles the author (Variava 1943 and 1948) reviewed the indications for the use of iron in the treatment of anæmias. They are also indications for intravenous iron generally. There are also certain special indications, where I.V. iron therapy is preferable to oral iron therapy. They can be summarised as follows:—

- (1) Severe cases of microcytic hypochromic anæmias, with counts below 2.5 million R.B.C. and Hb. below 40%.
- (2) Cases where oral iron produces gastric upsets.
- (3) Cases which show no response to oral iron therapy for a period of one and a half months.
- (4) Nutritional microcytic anæmias.
- (5) Idiopathic hypochromic anæmias.
- (6) Hypochromic anæmias of pregnancy.
- (7) Hypochromic anæmias resulting from chronic blood loss through hæmorrhage, or disease.

Utilisation of intravenous iron.—Duback *et al* (1946) and Finch *et al* (1949) studied the course of radio-active iron in the body, after intravenous injections. In *normal persons* the radio-active iron was deposited in the R.B.Cs. In two weeks time, about 75% of the injected iron was found in the R.B.Cs. The remaining 25% was stored in the tissues. In patients suffering from *iron-deficiency anaemias* practically the whole of the injected iron was utilised in Hb. formation. This observation was confirmed by Slack and Wilkinson (1949) who showed that in cases of microcytic hypochromic anæmias practically all the injected iron was utilised in Hb. formation.

Dosage:—An adult person having 100% Hb. has about 750 grams of circulating Hb. containing 2.5 grams of iron. To produce

a rise of 1% Hb. in a patient, 25 mg. of saccharated iron oxide must be injected intravenously (Nissim 1947, and Goetsche *et al* 1946). The usual preparations on the market, *e.g.*, Uniferron, contains 100 mg. of the elemental iron in 5 c.c. ampoules, *i.e.* 20 mg. per c.c., produce a rise of 4% increase of Hb. on injection. In order to restore 50% deficiency of Hb. in a patient, the total amount of iron required would therefore be $25 \times 50 = 1250$ mg. of iron, or 42.5 c.c. of the saccharated iron oxide solution.

This method of calculating the dosage, does not hold good in all cases. Thus, Goven and Scott (1949) have shown that in pregnant women, some iron is taken up by the foetus and the Hb. rise is only 2.6% for every 100 mg. used, instead of the normal 4% increase. Similarly in cases of severe anaemia, where the body stores of iron have been greatly depleted, and in the presence of chronic infection, large amounts of saccharated iron oxide will have to be injected. A safe method of calculating the dosage would be $1\frac{1}{2}$ times the normal dose, counted on the basis of 25 mg. for 1% rise of Hb. Thus, in the above instance of 50% Hb. deficiency, the total dosage required would be $1250 + 625 = 1875$ mg. of elemental iron, or $62 + 31 = 93$ to 94 c.c. of the solution.

Having determined the total quantity to be employed, the administration should be spread out as follows. On the 1st day 1.5 c.c., 2nd day 3 c.c., 3rd day 5 c.c., 4th day 10 c.c. Then 10 c.c. daily, or on alternate days, or even every 4th day, depending on the improvement noticed. This should be continued till the Hb. rise returns to normal on the specified calculated dosage. In the case of children, or in patients where the veins are difficult to find and in whom repeated injections would be difficult, administration of the total required dose by a single intravenous infusion is recommended.

Technique of administration.—The drug is to be given by the intravenous route only. A wide bore needle, with a short bevel is recommended. French (1949) recommends No. 19 record syringe needle. The needle should be in the centre of the lumen of the vein to prevent accidental extravasation. It is a good practice to draw some blood into the syringe, to be sure that the needle is in the vein. Then the solution is slowly injected. After administration, movements of the arm should be made to improve the circulation.

If the needle becomes dislodged during the injection, the skin in the region of the injection becomes discoloured. Some pain may also be produced in that region. In such cases the injection should be stopped immediately.

It is not necessary to neutralise the solution with an acid, or dilute it with glucose solution. Under no circumstances should the solution be mixed with an electrolyte, *e.g.*, saline, as an unstable preparation may be produced thereby.

If it is decided to give the entire quantity by intravenous infusion, then the whole calculated dose of the drug should be added to half to one pint of 5% glucose and given by the intravenous drip method at the rate of 30 drops a minute. The rate can be increased to 45 drops a minute, after about 100 c.c. of the solution have gone in. Towards the end of the infusion 200 c.c. of 5% glucose is run in, to wash off the iron from the walls of the veins.

Toxic effects.—Even large doses of intravenous iron oxide (300 mg.) have not produced any ill effects. Going over the literature, I gathered the following toxic manifestations:—

(1) *Central nervous system*:—Headache. This is common early in treatment. But when treatment is continued, it soon disappears.

(2) *Cardio-vascular symptoms*:—Tachycardia, dyspnoea, cyanosis, fall of blood pressure, even collapse. Precordial pain having the characters of angina pectoris has been noted.

(3) *Respiratory symptoms*:—Severe pain in the chest. In other cases pains resembling pleurisy are reported; even pain in the back.

(4) *Abdominal symptoms*:—Severe abdominal pains of a colicky nature.

(5) *General symptoms*:—Fever with rigors.

(6) *Local symptoms*:—Pain in the arm, either locally, or along the course of blood vessels. Cellulitis and thrombophlebitis.

If any of these toxic effects occur, the drug is stopped altogether, or reduced in dosage. If the symptoms are noted every time the drug is injected, then the preparation is changed. I have observed that a change of preparation helps in such circumstances.

Personal observations.—Below are cited 8 cases treated by me with intravenous iron medication. All these cases were admitted into the hospital, and kept under observation. These cases form part of an anaemia-study extending over two years. The total number of anaemia cases treated by me at the G. T. Hospital between April 1949 and March 1951 was 75. In all cases a detailed record of history, examination, investigation and progress of the case was maintained on special forms.

Out of these 75 cases of all types of anaemias 55 were iron-deficiency anaemias. For the sake of comparison, 26 cases were treated by the orthodox method (Variava, 1943). This comparative study was made to evaluate the merits of the intravenous iron therapy. Out of 29 cases treated by intravenous iron therapy, 8 cases are reported in great detail, so that a proper idea can be had of the rapid improvement that resulted from this therapy.

Preparation used:—In all cases I have used Uniferron of Unichem Laboratories, containing 100 mg. of iron, in 5 c.c. ampoules.

Dosage:—The total dose of Uniferron required for each case was calculated as detailed under dosage above.

Clinical Case reports.—Case 1:—Male 40 years complaining of frequency of stools with blood and mucus—2 months. General debility 2 months.

G. E.—Patient very anæmic with generalised œdema. Stool: motile entamoeba histolytica. R.B.C. 2.82 mill/cmm. Hb. 30.5%.

Treated for amoebic dysentery and anæmia. Hospitalised 10-10-'49 to 2-1-'50 (85 days).

10-10-'49 to 26-10-'49 oral therapy (12 days):—R.B.C. 2.54 mill/cmm. Hb. 30.5%. No rise.

27-10-'49 to 10-11-'49 (15 days):—70 cc. of Uniferron. R.B.C. 4.2 mill/cmm. Hb. 62%. Rise of 32% Hb. in 15 days.

10-11-'49 to 17-12-'49 (38 days):—Oral therapy. R.B.C. 4.35 mill/cmm. Hb. 85%. Rise of 23% Hb. in 39 days.

17-12-'49 to 31-12-'49 (14 days):—65 cc. of Uniferron. R.B.C. 4.5 mill/cmm. Hb. 95%. Rise of 10% in 14 days. In 85 days rise of Hb. 64.5%.

Deficiency of Hb. in this case was about 70% and the calculated dose of Uniferron required to make up the deficiency was 131 c.c. Total amount of Uniferron used in this case besides the oral iron therapy was 135 c.c. which gave a rise of 64.5% of Hb.

CASE 2:—Boy 9 years. Generalised œdema and debility—one month.

G. E.—Anæmia with slight generalised œdema, (nutritional deficiency). R.B.C. 2.3 mill/cmm. Hb. 28.3%. Hospitalised from 27-10-'49 to 29-12-'49 (64 days).

27-10-'49 to 5-11-'49:—(10 days):—Oral therapy; no rise.

6-11-'49 to 10-11-'49 (5 days):—Uniferron 20 c.c. R.B.C. 3.37 mill/cmm. Hb. 59%. Rise of 30% in 5 days.

Toxic effects noted on 10-11-'49. Headache, nausea, vomiting—so the injections were stopped.

16-11-'49 to 1-12-'49 (16 days):—Liver extract and vitamin B complex. R.B.C. 3.99 mill/cmm. Hb. 72%. Rise of 13% Hb. in 16 days.

2-12-'49 to 7-12-'49 (6 days):—Oral therapy.

8-12-'49 to 18-12-'49 (11 days):—Uniferron 30 c.c. R.B.C. 4.75 mill/cmm. Hb. 85%. Rise of 13% in 17 days. In 64 days there was 57% rise of Hb.

Deficiency of Hb. was 71.7% and the calculated dose of Uniferron was 135 c.c. The total amount of Uniferron beside the oral therapy, used in this case was 50 c.c. which gave a rise of 57%.

CASE 3:—Girl 10 years. Fever with rigors. Cough with slight expectoration—2 months. Epigastric pain—2 months.

G. E.—Emaciated, very anæmic with generalised œdema. Liver—1½ fingers. Spleen—1 finger. Heart and lungs—normal. Formal-gel test—positive for kala-azar. R.B.C. 1.6 mill/cmm. Hb. 21.8%. Hospitalised 21-11-'49 to 31-1-'50 (72 days).

21-11-'49 to 4-12-'49:—Treated for kala-azar. Uniferron 30 c.c. R.B.C. 2.58 mill/cmm. Hb. 41%. Rise of 20% in 14 days.

10-12-'49 to 31-1-'50:—Uniferron 85 c.c. R.B.C. 3.87 mill/cmm. Hb. 75%. Rise of 35% in 33 days.

24-1-'50 to 31-1-'50:—Uniferron 40 c.c. R.B.C. 3.51 mill/cmm. Hb. 102%. Rise of 27% in 6 days. Thus in 72 days there was a total rise of Hb. to 80%.

Deficiency of Hb. was 78.2%. Calculated amount of Uniferron was 146 c.c. The amount of Uniferron used was 155 c.c. which gave a rise of 80% of Hb.

CASE 4:—Male aged 27 years. Gradually increasing weakness 3-4 years; greater for the last one year. Fever with rigors off and on for the past 3 years.

G. E.—Anæmic—slight œdema feet. Liver and spleen—n.p. Heart lungs—normal. Screening chest—n.a.d. Stools—n.a.d. Blood smear M.P. not detected. R.B.C. 1.73 mill/cmm. Hb. 27%. Hospitalised from 15-12-'49 to 31-1-'50 (43 days).

18-12-'49 to 30-12-'49:—Uniferron 60 c.c. R.B.C. 2.7 mill/cmm. Hb. 56.7%. Rise of 30% in 12 days.

4-1-'50 to 11-1-'50:—Uniferron 35 c.c. R.B.C. 3.2 mill/cmm. Hb. 81.75%. Rise of 25% in 7 days.

24-1-'50 to 31-1-'50:—Uniferron 40 c.c. R.B.C. 4.8 mill/cmm. Hb. 100%. Rise of 18% in 8 days. Total rise of Hb. 73% in 48 days.

Deficiency of Hb. was 73%. Calculated dose of Uniferron was 136 c.c. The total amount of Uniferron used was 135 c.c. which gave a rise of 73% of Hb.

CASE 5:—Boy aged 15 years. Irregular fever with rigors and generalised weakness 1½ months. R.B.C. 1.79 mill/cmm. Hb. 22%. Hospitalised from 4-1-'50 to 31-1-'50 (30 days).

4-1-'50 to 13-1-'50:—Uniferron 40 c.c. R.B.C. 1.79 mill/cmm. Hb. 27%. Rise of 5% in 12 days.

14-1-'50 to 21-1-'50:—Uniferron 45 c.c. R.B.C. 3.1 mill/cmm. Hb. 52%. Rise of 25% in 9 days.

24-1-'50 to 31-1-'50:—Uniferron 40 c.c. R.B.C. 4.5 mill/cmm. Hb. 87%. Rise of 35% in 8 days. Total rise of 65% in 30 days.

Deficiency of Hb. was 78%. Calculated dose of Uniferron was 146 c.c. The total amount of Uniferron given was 125 c.c. which gave a rise of 65% of Hb.

CASE 6:—Male, aged 35 years. Fever 4 months. General weakness one month. Breathlessness on exertion 10 days.

G.E.—Anæmic and generalised œdema. R.B.C. 2.54 mill/cmm. Hb. 36%. Hospitalised 5-2-'50 to 15-3-'50 (41 days).

6-2-'50 to 13-2-'50:—Paludrine and Quinine. R.B.C. 2.4 mill/cm. Hb. 36%. No change.

13-2-'50 to 20-2-'50:—Uniferron 40 c.c. R.B.C. 2.56 mill/cmm. Hb. 50%. Rise of 14% in 8 days.

21-2-'50 to 28-2-'50:—Uniferron 40 c.c. R.B.C. 2.58 mill/cmm. Hb. 60%. Rise of 10% in 8 days.

1-3-'50 to 18-3-'50:—Uniferron 90 c.c. R.B.C. 3.97 mill/cmm. Hb. 76%. Rise of 16% in 18 days. Total rise of 40% in 41 days.

Deficiency of Hb. was 64%. Calculated dose of Uniferron was 120 c.c. The amount of Uniferron given in this case was 170 c.c. which gave a rise of 40% of Hb. in 41 days.

CASE 7:—Boy aged 10 years. Fever with rigors one month. Weakness and œdema of face and legs 10 days.

P. H.—Malarial attacks off and on for a long time. Very anæmic with generalised œdema. R.B.C. 2.13 mill/cmm. Hb. 22%. Hospitalised 30-3-'50 to 28-4-'50 (29 days).

31-3-'50 to 7-4-'50:—Uniferron 40 c.c. R.B.C. 2.8 mill/cmm. Hb. 34%. Rise of 12% in 8 days.

8-4-'50 to 14-4-'50:—Uniferron 35 c.c. R.B.C. 3.2 mill/cmm. Hb. 42%. Rise of 10% in 7 days.

15-4-'50 to 21-4-'50:—Uniferron 35 c.c. R.B.C. 3.95 mill/cmm. Hb. 50%. Rise of 8% in 7 days.

22-4-'50 to 28-4-'50:—Uniferron 35 c.c. R.B.C. 4.13 mill/cmm. Hb. 68%. Rise of 18% in 7 days. Patient went away against medical advice. In 29 days total rise of Hb. was 46%.

Deficiency of Hb. was 78%. Calculated dose of Uniferron was 145 c.c. Total amount of Uniferron given was 145 c.c. which gave a rise of 46% of Hb. in 29 days.

CASE 8:—Female aged 35 years. Intermittent fever, 4 months. Palpitation and œdema of feet—one month. Puffiness of face, 10 days. Anæmic with generalised œdema. Hospitalised 5-2-'50 to 29-3-'50 (53 days). R.B.C. 1.2 mill/cmm. Hb. 20%.

7-2-'50:—Blood transfusion 350 c.c.

10-2-'50:—R.B.C. 2.36 mill/cmm. Hb. 30%.

7-2-'50 to 14-2-'50:—Uniferron 40 c.c. Blood transfusion repeated 300 c.c. on 14-2-'50.

15-2-'50:—R.B.C. 2.9 mill/cmm. Hb. 36%. Rise of 6% in 8 days.

15-2-'50 to 21-2-'50:—Uniferron 35 c.c. R.B.C. 3.12 mill/cmm. Hb. 48%. Rise of 12% in 7 days.

21-2-'50 to 28-2-'50:—Uniferron 35 c.c. R.B.C. 3.31 mill/cmm. Hb. 58%. Rise of 10% in 7 days.

1-3-'50 to 7-3-'50:—Oral therapy. R.B.C. 3.56 mill/cmm. Hb. 66%. Rise of 8% in 7 days.

8-3-'50 to 15-3-'50:—Oral therapy. R.B.C. 3.9 mill/cmm. Hb. 72%. Rise of 6% in 7 days.

16-3-'50 to 21-3-'50:—Oral therapy. R.B.C. 4.1 mill/cmm. Hb. 74%. Rise of 2% in 7 days.

22-3-'50 to 29-3-'50:—Uniferron 35 c.c. R.B.C. 4.4 mill/cmm. Hb. 84%. Rise of 10% in 7 days. Thus the total rise was 64% in 52 days.

Deficiency of Hb. was 80%. Calculated dose of Uniferron was 150 c.c. The total amount of Uniferron, given besides the 650 c.c. of blood and oral therapy, was 145 c.c. which gave a rise of 64% of Hb. in 52 days.

Conclusions.—1. Intravenous iron medication constitutes a great therapeutic advance over the old orthodox oral method. Response to oral therapy is so poor that, that even after two months, treatment with iron orally, there is no appreciable rise in R.B.C. or Hb. % But with intravenous iron the response is rapid and uninterrupted. In a great majority of patients the rise is optimum i.e. 1% a day. Thus intravenous iron is very useful in cases which are refractory to oral therapy.

2. The dose as recommended here may prove insufficient in severe cases and larger doses may have to be employed.

3. No toxic reactions were noted except in three cases. Case 2 recorded above had headache, nausea and vomiting. The other two registered a rise of temperature after intravenous iron.

My thanks are due to Mr. Mody of Unichem Laboratory for placing at my disposal a liberal supply of Uniferron to enable me to make this clinical study.

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ADVANCES IN THE TREATMENT OF LEPROSY

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THE chemo-therapy of leprosy has made rapid strides during the past 2 decades and we have now a number of drugs acting on the lepræ bacillus *in vivo*, producing almost dramatic results in both lepromatous and tuberculoid forms of the disease. In leprosy, unlike in other diseases, the duration of treatment is a very prolonged and tedious one, and this usually discourages the patient from taking the full course of treatment. With the older hydnocarpus group of drugs, it took from 5 to 10 years for a moderately advanced lepromatous patient to become non-infectious but the same result is now achieved within a period of 1 to 3 years by using the modern drugs. This short paper deals with the therapeutic activity of 3 of the well known drugs namely Sulphetrone, Diamino-diphenyl Sulphone and Thiosemicarbazone or T.B. 1/698.

Sulphetrone.—Sulphetrone first discovered in 1936 is a derivative of Diamino-diphenyl Sulphone. It is more readily soluble in water than the other sulphone drugs and also less toxic. It acts equally well both on *B. tuberculosis* and *B. lepræ*. By mouth it is less efficacious than when given parenterally, since 85% is excreted by the bowels unabsorbed; this is shown in the following table of Smith (1949) who undertook a pharmacological study of the absorption, distribution and excretion in human beings of 3 of the sulphone drugs, *viz.*, D.A.D.P.S., Diasone and Sulphetrone :—

Mean No. of observations	Drugs, route, frequency	Daily total dosage in grammes	Mean % of intake recovered from faeces	Limits (% of intake)
7	D. A. D. P. S. orally once daily	0.1-0.4	4	1-7.5
6	Diasone orally twice daily	0.3-2.7	46	27-67
13	Sulphetrone orally twice daily	2-8	85	70-96
3	Sulphetrone I.M. single dose	2-4 (single)	7.4	5-10

Hence, Cochrane recommends a 50% solution of Sulphetrone in distilled water parenterally as the best method of giving sulphone therapy for all the lepromatous and some of the tuberculoid cases which show slight scaliness in the patches and which are oedematous and more or less active.

Dosage and mode of administration:—Cochrane recommends 4 c.c. of the 50% solution for adults and 2 c.c. for children to be given

subcutaneously or intramuscularly twice a week for a period of 2 to 3 years. Anæmia is no contra-indication to start the treatment. Concomitant treatment with iron and yeast is not needed in the case of parenteral administration of sulphetrone, whereas it is absolutely necessary when the oral route is used.

Mode of action of Sulphones in general:—Gemar and Fite suggested that the sulphones acted by eliminating the bacterial infection from the blood vessels and blood stream, thus preventing the dissemination of *M. lepræ* and their further multiplication. These are bacteriostatic and not bactericidal in action. Within 20 days after the commencement of the treatment, the bacilli break up to assume the granular form. The significance of these granules has not been fully elucidated, but they appear whenever the environment is rendered unfavourable to the multiplication of *M. lepræ*. This change also occurs with the oil and ester treatments. Histologically the granuloma begins to clear from the dermis. This is the time when marked clinical improvement is shown by the patient. When the bacilli can no longer be seen in the corneum of the skin, granular forms frequently remain in the small subcutaneous nerves. The bacilli therefore, persist in the nerves longer than in the skin and may act as reservoirs from which recrudescence of the disease may take place.

Diamino-diphenyl Sulphone.—This is sold under the proprietary name of "Aolosulfon I.C.1." and is the parent substance from which are derived the three less toxic derivatives, *viz.*, Promin, Diasone and Sulphetrone. This was used as early as 1936 by Cochrane in the treatment of leprosy but was given up as being too toxic for human beings. Consequent on the knowledge gained recently that the 3 complicated sulphones when administered, break down in the body by a process of hydrolysis to form D.D.S., and that it is the D.D.S., content of those drugs which really acts, leprologists have evinced greater interest in the parent compound and have been using it freely for leprosy out-patients. The chief advantage of this drug is its low cost. For mass treatment of poor patients attending as out-patients in a leprosy clinic, there is no better drug than D.D.S.

DOSAGE:—The following is the dosage adopted in the General Hospital out-patient clinic :—

First 4 weeks	...	50 mgs. or half-a-tablet daily.
Second 4 weeks	...	100 mgs. daily for 5 days in the week with 2 days' rest.
9th week onwards	..	100 mgs. daily for all the 7 days of the week.

Treatment is continued till the patient becomes negative to smear examination and for one year thereafter. The cost of treatment per patient works out to only Rs. 5/- per year. If the

RICKETS, ITS SYMPTOMATOLOGY AND THERAPY

GURSARAN SINGH, M.B., B.S., D.O.M.S.,
Circular Road, Solan (Simla Hills).

RICKETS is very common in this locality and the causes are mal-nutrition of the parents and the child, congestion and improper houses which on account of defective structure do not allow sufficient light, sunshine and air into the residential rooms. Bazaars and streets are narrow and children cannot have sufficient fresh air and sunshine when playing.

The presenting symptoms may be misleading and I have known practitioners of all systems treating such cases on symptomatic lines without taking sufficient care to exclude rickets. Ayurveds, Hakims and Homœopaths cannot successfully treat this condition because they only employ drugs, whereas the real treatment consists in the supply of the deficient vitamin. Wrong treatment is one of the main causes of infant mortality in India.

The child may be brought for any one or more of the following complaints:—

1. Acute bronchitis.
2. Chronic bronchitis.
3. Bad throat and cough if tonsils are enlarged, they divert the attention from the real illness.
4. Common colds.
5. Indigestion with alternate diarrhoea and constipation.
6. Acute diarrhoea.
7. Chronic diarrhoea—a very common and early symptom of rickets. Palliative treatment will do no good.
8. Chronic constipation.

[Nos. 1—7 are due to the lowering of the resisting power of mucus membranes, caused by vitamin D deficiency, thus making them more liable to invasion by the infective organisms. No. 8 is due to weakening of the intestinal musculature.]

9. Low fever.
10. Bouts of high fever.
11. Typhoid-like fever.
12. Influenza-like condition.

[It is not clear if these conditions are due to the stimulation of thermal centres by some unknown toxin or due to disordered metabolism or to infection. But these conditions due to vitamin D deficiency are fairly common and are readily cured by its supply.]

13. *Soka* is the Punjabee term for general emaciation or wasting chronic ill-health. Such a condition is cured by vitamin D.
14. Umbilical hernia due to the weakening of the abdominal muscles.

15. Convulsions during fever.

16. Enlarged liver—it may be actually enlarged or it may appear to be enlarged due to ptosis which is aided by flattening of the chest and weakening of the ligaments and abdominal muscles.

DIAGNOSIS :—I have seen fully developed rickets in an infant aged 3 months. Pot-belly is a characteristic sign. Beads at the costo-chondral junction, may not be visible, but they can always be felt with the fingers if looked for. A transverse groove above the costal margin is fairly common. Unless the child is desperately ill, he is generally mentally alert. I attach great importance to the last point in arriving at a diagnosis.

TREATMENT :—Full doses of cod-liver oil or adexolin and exposure of the limbs to sunlight. Attention to dieting ensuring at least $\frac{3}{4}$ seer of milk daily for an infant 9 months old. For older children eggs can be added to the diet. Children with diarrhoea cannot assimilate cod-liver oil. For such cases appropriate doses of sulphaguanidine are given for 2 or 3 days only. A few years ago there was no chance of saving very advanced cases of rickets because the child could not absorb the needed food and vitamins given by the mouth, on account of the deranged condition of the stomach and bowels, but now they can hope for and get recovery through injecting intramuscularly large doses of the deficient vitamins. It is sound practice to give vitamin C in tablet form as well, in addition to the usual ounce of fruit-juice daily.

A few illustrative cases :—**CASE 1** :—A male child, 9 months old, was suffering from continuous fever of 15 days' duration, temperature ranging between 100°F—103°F. with loss of appetite; the child was mentally alert. Three injections of Ostelin forte every fourth day were given and the child began to progress and take its nourishment after the 2nd injection. He was then put on Adexolin and (vitamin C) Celin by mouth. The case was so acute that it developed pigeon-chest within about a fortnight; the parents said that the child was quite hale, healthy and fleshy before the present illness, but when I saw him for the first time, costo-chondral changes were already manifest.

CASE 2 :—A girl, aged 10 years, was brought to me for low fever of two months' duration. The temperature rose to 99°F—99.4°F. every afternoon. She was otherwise feeling well and attending school. Hers was a case of late rickets. Two injections of Ostelin forte were enough to get rid of the fever. She was then put on full doses of Adexolin.

CASE 3 :—A girl, aged 4 years, had been suffering from repeated attacks of fever of 3 or 4 days' duration with cough etc. for over 6 months. She also used to have convulsions during fever. The last attack of fever was rather prolonged and so I was consulted. I found all the signs of rickets. She was put on Ostelin forte injections and Adexolin. She made good recovery from all her previous complaints of ill-health.

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Aureomycin borate when applied locally as a half per cent solution shows a wide range of therapeutic usefulness in ocular infections, due to gram-positive cocci and gram-negative bacilli as well as in inclusion conjunctivitis and herpes simplex of the cornea. Aureomycin marks a further advance in antibiotic therapy and has been found effective in certain virus infections, I have used it successfully in the following eye diseases:—

Acute catarrhal conjunctivitis.—Some cases of acute catarrhal conjunctivitis which did not respond even to penicillin, or which were penicillin-resistant were cured promptly by aureomycin. Cases of acute catarrhal conjunctivitis which were badly neglected and which developed complications, such as corneal ulcer, also responded effectively to aureomycin. But aureomycin being an expensive drug cannot be used for any and every case. Ordinary cases are usually treated and cured by other simple remedies.

Corneal ulcer.—Corneal ulcers are treated and cured by aureomycin, but atropine sulphate should be given in conjunction with aureomycin; general treatment should also be given when required; the ulcers heal more rapidly than with the time-honoured treatments.

Trachoma.—It is a very dangerous disease of the eye which frequently causes blindness. There was no reliable specific treatment for this condition till antibiotic therapy was introduced. Prior to this, the complications that occurred were alone treated by temporizing, while there was no cure for the main condition.

Trachoma is a virus disease. So aureomycin is used both locally and systemically. Some authors found that conjunctival and corneal ulcers cleared up rapidly. Some others consider that aureomycin does not cure the trachoma but is useful in treating the associated complications. In some cases, it was observed that fibrosis, which marks the early stage of recovery, had started. Aureomycin has been found to yield satisfactory results in trachoma, and so I tried it in some cases. I give below the report of a case, treated by me.

CASE REPORT:—A Hindu boy, aged about 5, came to me with the following complaints:—1. Photophobia; 2. lachrymation; 3. foreign body-sensation in the eyes; and 4. gleaming of the eyelids. The symptoms had lasted for a few months.

On examination the following signs were noted:—1. Inability of the patient to look at the light; 2. the bulbar conjunctiva was congested and the colour was muddy; 3. the lower palpebral conjunctiva was also congested; and 4. the upper eye lid showed granules on eversion and was badly congested. Infiltration of the cornea had not however, yet occurred.

TREATMENT:—1. Aureomycin ophthalmic ointment (Lederle) was applied every three hours, as also.

AUREOMYCIN— A MODERN THERAPY IN EYE DISEASE

SANTOSH KUMAR MUKHERJI, M.B. (cal.).

*Post-Graduate Diploma in Ophthalmology, Carmichael Medical College,
Member, All-India Ophthalmological Society, Superintendent and Hony. Visiting
Ophthalmic Department, Sri Ramkrishna Mission Arogya Niketan, Midnapore.*

AUREOMYCIN, one of the latest antibiotics is derived from *Streptomyces aureofaciens*. It is so named on account of the production of a golden yellow pigment at a certain stage in its growth. The antibiotic obtained from *S. aureofaciens* is also of a faintly golden yellow colour and is called *Aureomycin*.

Aureomycin is a yellow crystalline substance which is soluble in acid and alkaline solutions. A two per cent solution of aureomycin hydrochloride in water has a pH of 4.5. In the dry state the drug is stable but in solution it rapidly loses its antibiotic activity particularly in the presence of serum, whole blood etc.

Pharmacology.—Aureomycin produces no systemic effect and does not interfere with the normal responses of life. Its toxicity is low. It appears to have a mild diuretic action which is about one-third of that induced by caffeine.

Aureomycin appears in the urine about one hour after oral administration. Its excretion is prolonged as shown by the fact that its antibiotic activity is demonstrated in the urine 3 or 4 days after the last dose is given by the mouth. Aureomycin hydrochloride solution when injected subcutaneously or intramuscularly, is an irritant and so this route is not to be recommended. An one per cent solution of aureomycin borate dropped in the eyes of a rabbit, does not produce any irritation. Half per cent solution of aureomycin borate was used in ocular infections of the eye without any damage to the conjunctivæ or cornea. An effective concentration in the system of the antibiotic can be maintained by the oral administration of the drug at 6 hourly intervals. The daily dose in most cases was of the order of 15 mg. to 30 mg. per kg. of body-weight and the side-effects noticed in a few cases were nausea, vomiting or diarrhoea.

The most interesting and promising field of investigation concerns the activity of aureomycin against the viruses. It is also an inhibitor of gram-positive-cocci and gram-negative-bacilli but the other antibiotics of this group are superior to aureomycin in this respect.

Therapeutic use in eye diseases.—It is used in various diseases; I would refer here only to its use in ocular infections. It is used locally either as an ointment or in solution. I have used only the ointment in all my cases.

Aureomycin borate when applied locally as a half per cent solution shows a wide range of therapeutic usefulness in ocular infections, due to gram-positive cocci and gram-negative bacilli as well as in inclusion conjunctivitis and herpes simplex of the cornea. Aureomycin marks a further advance in antibiotic therapy and has been found effective in certain virus infections, I have used it successfully in the following eye diseases:—

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TREATMENT:—1. Aureomycin ophthalmic ointment (Lederle) was applied every three hours, as also.

2. $\mathcal{R}$ Sulphapyridine (sterilized) ... gr. v
 Acid Boric ... gr. ii
 Vaseline (white and pure sterilized) ad. ... 3 ii

These two ointments alone were used, and marked improvement resulted.

The granules subsided, as also the congestion of the conjunctivæ. The patient is almost fully cured and the cure is certainly attributable to aureomycin.

Epidemic kerato-conjunctivitis or monocular kerato-conjunctivitis.—This infection is caused by a virus; there is corneal opacity with conjunctival congestion of one eye and the preauricular gland of that side is enlarged and tender. Aureomycin-ophthalmic ointment combined with sodium sulphacetamide solution 20% yielded very good results, particularly when the treatment was started early. There is evidence of a decrease in the duration of symptoms, but this will not prevent the formation of corneal infiltration.

Herpes zoster ophthalmicus can be cured if aureomycin is given orally early in the disease. I have not however, treated any case of herpes zoster ophthalmicus with this drug.

"Dewan Khana,"
 Midnapore P.O.

Inheritance of Diabetes Mellitus

The relation between heredity and the age of onset of diabetes mellitus was the subject of a carefully planned investigation by Thompson and his co-workers. 583 males and 817 female patients were studied. The ages of these patients at the time of onset of diabetes ranged from 14 months to 83 years. A family history of diabetes mellitus was obtained in 50 per cent of the male patients and 51.4 percent of the female patients. The percentage of the patients with diabetic family histories varied inversely with the age of the onset of the disease. The onset was latest in all diabetics with no previous family history, earlier for those with family history and earliest for those with bilateral family history of diabetes mellitus. The authors consider that diabetes mellitus behaves genetically as a graded character. This opinion is however not in agreement with the view held by many, that the young diabetics are homozygous and the older diabetics are heterozygous.—(*Can. Med. Assoc. Jour.*, Vol. 47, 556, 1951).

Clinical Results in Diabetes Treated with Crystalline Protamine Zinc Insulin of Hagedorn

Palmer and his coworkers used crystalline protamine zinc insulin of Hagedorn (NPH) on 24 diabetic patients over a period of two years and found that the use of NPH insulin gave greatly improved control of the blood sugar level and brought about also a greatly lowered incidence of hypoglycæmic reactions in all the patients. In all cases which required the use of mixtures of insulin, NPH insulin was found to be the most simple and easy of accurate administration.—(*Bull. Mason. Clin.*, 4, 4-12-1951.)

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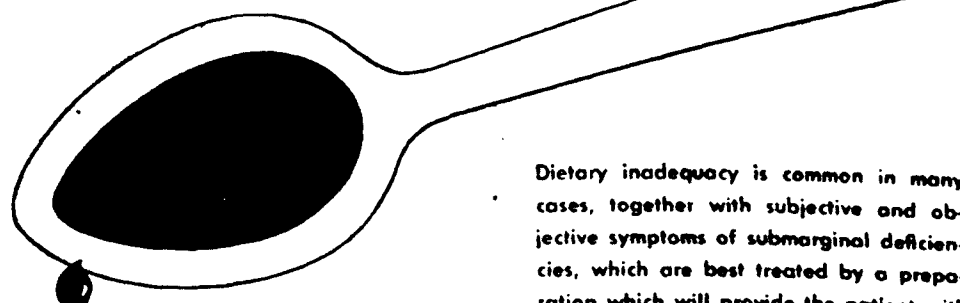
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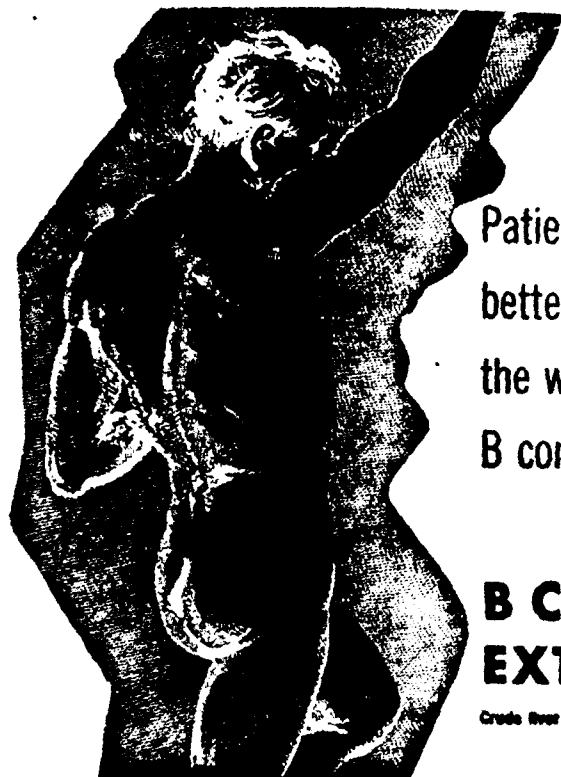
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(Spies & Butt in Duncan Diseases of Metabolism 1947, p. 302)

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THE MODERN TREATMENT OF PULMONARY TUBERCULOSIS IN RURAL AREAS

P. K. MENON, L. M. P.,

Hony. Medical Officer, L. F. Hospital, Ottapalam, S. Malabar.

No other problem in medicine has been so much discussed in the press and on the platform in recent times as that presented by tuberculosis. Results of elaborate and painstaking statistical investigations have been published but the data for most of these have been gathered from urban areas. It has been stated that there are at least five million tuberculous persons in India with half that number of open cases. No one can verify or contradict this, but the fact remains that this problem obviously challenges the best of medical administrative skill.

We have learnt, since Koch's discovery of the bacillus in 1892, much about the destructive processes of the disease in human and experimental material. This protean bacillus invades practically every organ of the body and though the modes of invasion and infection have been closely studied and more or less understood, it still remains to be explained why all infected individuals do not develop the clinical disease or why the course of the illness is so variable in different persons. The predisposing causes, *viz.*, under-nourishment, overcrowded, ill-ventilated and insanitary living conditions, and states of the mind like anxiety and worry, are now recognized as axiomatic truths. My own observations in Burma, Siam, China, and in rural Malabar have however, convinced me that such dicta are not *always* borne out by facts. I have found that in practice the infection claims more victims from the economically emancipated rich and well-to-do upper and middle classes, than from the poor labouring classes who eke out a miserable living under ideal predisposing conditions. The *cherumas* and *parayus* of Malabar are practically free from this disease. So are the sea gypsies of S. E. Asia and the tribal people of N. E. Burma. Economically their condition is the same, except that the latter have more of fat and animal protein like pork, fish and beef in their dietary while the former live an almost ascetic life on *kanji* (thin gruel of rice), salt and an occasional vegetable or a piece of salted fish. They live in ill-ventilated, primitive, and insanitary huts along with their domestic animals and poultry and frequently huddle together, more than half a dozen living in each hut. Tuberculosis is widespread among the middle and upper classes of Malabar who surpass in cleanliness, social and personal hygiene any other class of people similarly placed economically; in the rich and wealthy Chinese of S. E. Asia and Burma it is also equally common. Recently in one of our sanatoria I came across a couple of athletic young men weighing more than 200 lbs. each, who had cavities in

both lungs and were subject to repeated hæmoptysis. Opportunities for contact and dissemination are almost equal in the three countries. Why then this immunity of the likely and the vulnerability of the unlikely?

There is some evidence that hereditary diathesis, environment and/or bacterial allergy play some important though as yet ill-understood role, in the development of the pathological lesions of tuberculosis. We have no means at present of gauging these susceptibilities. We cannot say yet whether these depend on the quantity or quality of the infecting organism or of the host or whether some abnormal condition or speed of reaction in the host determines the course of the disease. Perhaps both factors might operate simultaneously. Individual susceptibility varies in different individuals and in the same individual at different times, and at different periods of life. We still do not know as to which organ if any, is concerned in the abnormal general reactions of the waxing and waning of immunity. The liver has been credited with the formation of antibodies in most other immunity reactions, but no conclusive evidence has yet been found to incriminate the dysfunction of this organ in the predisposition or abnormal susceptibility to tuberculosis.

The diagnosis of tuberculosis in rural areas presents little or no difficulty in practice as it is only the moderately well-advanced cases that seek modern medical aid, but I have found it safer to get a radiograph and differential count and a sputum examination done since tropical eosinophilia—very common in these parts—closely simulates tuberculosis. It is not necessary here to dilate upon the signs and symptoms of tuberculosis but I may mention that gastrointestinal symptoms such as anorexia, looseness or constipation of the bowels, have been universally present in my cases and frequently were the earliest or only symptoms complained of, for which relief was sought.

The aim of treatment is not merely to achieve a clinical cure but to return the patient to active and useful life as early as possible. Of the many lines of treatment, only rest and chemotherapy offer any prospect of success to rural people, practitioner, and patient alike. Collapse and/or resection is absolutely out of the question; lack of specialists and facilities, the high cost, prolonged convalescence, a general suspicion of all operative procedures, and practical difficulties in staying away from home, all militate against sanatorium treatment. Further, it is becoming increasingly well known, that only selected cases respond with any chance of success to various operative measures.

It is a wise step to give the rural patient an idea of the nature and spread of this disease and disclose the probable cost of the spread of infection and always insures continuation of the treatment through a full course.

The enforcement of absolute rest in bed is imperative in pyrexia and fatigue of tuberculosis, but the absence of both should enable a relaxation of the rule to be made. The parenteral administration of streptomycin *per se* does not call for absolute rest. Three of my patients were walking four miles a day to receive their injections and all of them are now working 8 to 10 hours a day during the last two years. Progressive graduated exercises are more beneficial to the body and mind than absolute enforced rest which encourages unhealthy introspection in the patient. The "rest and be saved" dictum may have served some useful purpose in the past but it is very doubtful if adherence to it can be secured in these fast times with the increasing tempo of the struggle for existence.

No other drug has evoked so much medical and lay controversy in recent times as streptomycin; at the same time no other drug has hitherto challenged—be it temporarily at times—the inexorable march of tuberculous disease. How well do we remember those days, yet recent, when the combined skill of medicine and surgery, even in those institutions that have become famous, consistently failed to make the least impression on the remorseless progress of tuberculosis, while today the hypodermic needle wielded by even the ordinary rural medical practitioner in out of the way villages, is able to arrest it.

The mode of action of streptomycin is still obscure. Much has been written and talked about its so-called indiscriminate use. Nervous, vestibular, and cochlear damage, the possibility of some of the organisms becoming resistant, and hypersensitisation of the patient to the drug, all have been urged against its widespread use, by the prophets of evil. May I ask whether these same objections could not be made in respect of the sulphonamides, penicillin, and the other antibiotics? Yet does our experience with these drugs that offer almost miraculous relief in some of the most acute, disabling, and dangerous diseases, contraindicate their universal administration? Do not ordinary drugs that almost any medical tyro is allowed to dispense, drugs like chloroform, pentothal sodium, procaine, quinine, arsenicals and such a common thing as chonopodium oil, give rise to more accidents and cause more systemic damage than streptomycin has ever been reported to have occasioned? One specialist even wrote that streptomycin should be reserved for dangerous forms like miliary, meningitic tuberculosis, which used to be almost always fatal. It sounds to me like reserving badly needed present day hospital accommodation for future bomb casualties!! Something like this actually happened in Calcutta in 1943 when beds were reserved for casualties from possible Japanese air-raids while thousands of persons were dying of famine, unattended and uncared for.

A dose of one gram a day of streptomycin is both safe and effective. Since the total dosage has not yet been stabilised, anything between 30 and 90 gms. is now given. Personally I have

limited my use of it to a 40-day course of 40 gms. It is worth noting that only three of my many patients had giddiness and/or vertigo but these were not serious enough to interfere with the routine administration of streptomycin. One patient had urticaria and a rise of temperature on the eleventh day but even if it related to the exhibition of streptomycin, no aggravation was encountered with the continuance of the regime. I did not come across a single serious reaction, amongst my cases.

Para-amino-salicylic-acid (PAS) and its sodium and calcium salts are useful adjuncts to streptomycin with which they are believed to act synergistically. The tendency to the formation of resistant strains is thought to be less with this combination than with streptomycin alone. Eight to 15 gms. a day according to the weight of the patient for a period of three months is very helpful. Gastro-intestinal upset is the main drawback. Anorexia, vomiting, diarrhoea, constipation, and discomfort or pain in the abdomen are frequently met with and it is advisable to withhold the drug in such cases for two or three days in a week.

Thiosemicarbazone (Conteben-Bayer: Dose .025 to .75 gm. Duration of treatment 3 months) is too new for an opinion on its efficacy to be hazarded. I have given it only to two patients and the effects are being watched. Gastro-intestinal irritation seems to be common but is relieved by Methionine 0.5 gm. t.d.s. If this drug is found to be at all effective its simplicity of administration and cheapness should make it very popular in rural parts.

Benzoicthiocarbamide (Necacyl) 5 to 10 c.c. I.V. on alternate days or daily for about thirty injections is another useful drug. It is the least toxic of the available chemotherapeutic agents. The appetite is increased, the temperature is reduced, and a sense of well-being is induced, all of which are powerful psychological factors in the achievement of a cure. I have tried it only in five cases and no general conclusions of value can therefore, be drawn.

Cepharanthin is a Japanese drug stated to be an alkaloid from a Formosan menispermaceæ. It acts as a powerful stimulant of the reticulo-endothelial system. So far only two of my patients have received this treatment and no opinion can therefore, be ventured. I give below notes of some cases from my practice:

CASE 1:—K. N., male, 24. While on active service in Kashmir in 1948 developed first symptoms—was invalided after being an in-patient in various military hospitals—invalided in October 1948 with extensive bilateral infiltration. Within three days of his arrival in his native village, had severe hæmoptysis lasting over two days. When first seen by me on 2-11-48 had temperature ranging from 101°F to 105°F, pulse 140. Poor tension. Respiration 42. Auscultative signs all over both lungs. Sputum positive. Expectoration more than 8 ozs. a day.

TREATMENT:—Streptomycin 1 gm. in three doses daily which brought the temperature down to normal in 6 days. Thereafter,

1 gm. a day in one injection was continued for 95 days with calcium 10% in 10 c.c. I.V., Vitamin C 500 units I.V., three times a week. The patient complained of giddiness and vertigo with loss of appetite from the third week onwards. Treatment was continued. After 2½ months he had giddiness only but the appetite completely returned only after the stoppage of the drug. The patient was allowed to walk for sanitary purposes from the second month onwards. Graduated exercises were given over 4 months and at the end of 6 months he was allowed full normal activity. The patient gained 58 lbs. in six months.

CASE 2:—V. A. M., male, 32. Had a family history of pulmonary tuberculosis, two brothers and a sister died of it and the still living father had symptoms at 76! Patient while undergoing collapse therapy (A.P.) for a left sided cavernous lesion at the hands of a specialist in 1948 developed a right mid-zone lesion. Treatment with streptomycin 1 gm. daily after stoppage of A.P. and other measures. Temperature came down to normal after 9 days and the cough disappeared after a month. He was allowed to exercise gradually (walking) and by the end of the third month could do three miles a day. He walked daily to my dispensary and back, for his injection, a distance from his residence, of over a mile. After the first course of 90 gms. he began putting on weight and increased from 104 to 146 lbs. very rapidly. I have watched him for over two years now, daily spending 8 to 10 hours in his fields doing hard manual labour.

CASE 3:—T. K. N., male, 26. While working as a railway clerk developed a left apical lesion with hæmoptysis; he was started on streptomycin 1 gm. a day for 90 days during which time after the first fortnight he walked a distance of over two miles to my dispensary and back for his injections. Twelve gm. a day of PAS was also administered for three months after which a radiograph showed no lesion. He was allowed to join duty after another six months with a second course of 30 gms. of streptomycin, after three months. He has been free from any symptoms for the last eighteen months.

CASE 4:—M. V. M., male, 23. Student of the B. Sc. class complained of shortness of breath and anorexia. Respiration 42. Pulse 130. Evening temperature 102°F. Radiograph and physical findings revealed extensive bilateral lesions. He was put on streptomycin 1 gm. daily and 10 gm. of PAS for 60 days.

Though other symptoms were relieved his temperature still showed 99°F to 100°F (oral) in the evenings. He was then given Necacyl 5 c.c. I.V. on alternate days after six of which injections the temperature touched normal and the patient started gaining weight. Radiograph after 4 months showed remarkable improvement, though the left mid-zone and apical infiltration persisted.

CASE 5:—K. K. M., male, 40. Developed apical cavity with evening rise of temperature. He was put on streptomycin 1 gm. for 54 days and PAS 10 gms. a day which had to be stopped due

to anorexia, vomiting and abdominal pain. Clinically he was much relieved and returned to duty as an Inspector of Coffee, and was continued on Cepharanthin 0.1 gm. by mouth daily and 0.1 mg. I.V. weekly for the last one year; he has been normally active and symptom-free.

CASE 6:—P. K. A., female, 60. Had bilateral cavernous lesion, was put on streptomycin $\frac{1}{2}$ gm. daily. On the 14th day she developed urticaria and a temperature of 102°F. This was ignored and medication was continued for 46 days. She was much relieved of the clinical symptoms and has now returned to normal household duties since the last two years.

CASE 7:—S. G. N., male, 48. Had pleurisy with effusion on the left side in 1947—developed a left side cavity in 1950—was put on streptomycin $\frac{1}{2}$ gm. daily for 42 days and 8 gm. PAS daily. The latter had to be stopped every two days a week due to gastrointestinal upset. He was allowed to walk after the 15th day of treatment and continues to be free of symptoms and is leading a normal agricultural life for the last eighteen months.

CASE 8:—B. M., male, 58. History of cough for past 20 years—had bilateral lesion of a cavernous nature. He was started on streptomycin $\frac{1}{2}$ gm. daily and PAS (Calcium salt) 10 gm. daily for 42 days. He was much improved clinically and has been symptom-free for the last one year.

CASE 9:—K. N., male, 30. Extensive bilateral lesion with laryngeal involvement—was put on streptomycin 1 gm. daily and PAS 8 gms. a day for 30 days. This reduced the temperature but did not benefit him much and he was therefore put on Contaben. From the 14th day onwards laryngeal involvement cleared up remarkably and other favourable signs such as subsidence of cough and temperature and gain in weight were noted. He had anorexia and vomiting from the starting of Contaben for which Methionine $\frac{1}{2}$ gm. t.d.s. was administered with benefit.

CASE 10:—A. N., male, 74 father of No. 2 *supra*. Had right sided lesion mid-zone and apical, developed repeated hæmoptysis for which usual coagulants were ineffective. He was given $\frac{1}{2}$ gm. streptomycin a day for 42 days and PAS 8 gms. daily. Hæmoptysis stopped on the 4th day of treatment. He was clinically improved and has been leading a normal life since 1½ years.

CASE 11:—R. E., male, 42. Extensive bilateral infiltration of 1½ years' duration, in a very bad state when first seen. Given $\frac{1}{2}$ gm. streptomycin daily and 10 c.c. Neocoyl I.V., and 8 gms. PAS daily. This was continued for 42 days (Neocoyl only 30 days). Temperature and cough reduced very much and clinically much improved. He is still continuing PAS and is taking Cepharanthin tablets. Keeps up the improvement for the last ten months. Since he has breathlessness still, he is allowed to get out of bed only for sanitary purposes.

(All the above patients except No. 6 were radiographically examined with positive findings and the blood and sputum were also positive for T.B.).

TREATMENT OF SOME COMMON SKIN DISEASES

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THE disorders most commonly met with are epidermophytosis, dermatitis venenata, insect and mite bites, and tend to be persistent and severe. Secondary infection is a complicating factor in nearly every case, and very often the infection and not the primary disease leads to hospitalisation.

The general care of these patients is of great importance. Difficult living conditions, a hot climate, and the lack of appetizing food undoubtedly reduce the stamina and resistance to infection. It is not uncommon to find that a chronic ulcer started as a trivial scratch or that a cellulitis as a simple fissure. Rest, clean surroundings, well-prepared foods, and vitamins in full doses are essential parts of the programme of treatment. These patients fare better in a dry fly-proof building where cleanliness, asepsis and general nursing care are easier to ensure than in the ordinary ward.

Epidermophytosis.—In the tropics, where conditions are ideal for its development and spread, this disease presents greater difficulties than in temperate regions. It incapacitates men despite all efforts to keep clean with soap and water, boiled socks and foot powder. The disease is frequently advanced and secondarily infected by the time the patients reach the hospital. Over-treatment is the commonest error in management. Strong solutions and strong ointments tend to irritate an already damaged skin, hinder recovery and even aggravate the condition. A routine stereotyped course of treatment is often the reason why many cases of "athlete's foot" fail to improve. Treatment has to be individualised and adapted to the needs of each case.

The acute stage, characterized by fissure, vesicles, broken blisters and denuded areas between the toes and under the feet, is generally complicated by secondary infection. Control of this secondary infection is the first line of treatment. The patient is put on complete bed-rest. The diseased areas are gently debrided of all loose epidermis and the tops removed from the large blisters every day. The feet are cleaned with a mild sterile soap solution. Warm soaks in a weak fungicidal solution are started. Potassium permanganate is suitable and a solution of 1:10,000 (0.30 gm. in 3000 cc.) will do. Solutions stronger than 1:5000 will irritate. The feet are soaked for twenty minutes three times a day and dried. If the disease is spread over a wide area or if there is extensive secondary infection, warm compresses of the same solution are to be continued. Between soaks, the feet are left uncovered. In cases with extensive weeping, the feet are exposed to dry heat under a cradle or in the sunlight to dry the skin and prevent maceration. When blisters or fissures between the toes are present, the opposing

surfaces are separated with sterile gauze. This helps to prevent maceration of the skin. It is often desirable to put light sterile dressings over the affected areas at nights.

In many cases the secondary infection disappears and the original fungus infection subsides after two to four days of rest and soaks. The vesicles, fissures and macerated areas dry up and the thickened epidermis slowly peels off. The feet are kept clean and dry with foot powder and the patient is watched until desquamation is complete and all evidence of activity has disappeared. More often, the secondary infection subsides and the vesicles and blisters of the acute epidermophytosis are replaced by patches of thickened epidermis, with scaling and oozing from under the patches. A few more daily soaks with potassium permanganate solution may control this condition. If no improvement occurs within this time, Castellani's Paint* or a two per cent gentian violet in 70 per cent alcohol is applied. Frazer's solution† or tincture of iodine is also effective in this stage. It was found best to start off with a quarter to one-half strength solutions and to increase slowly until the full strength is applied twice daily. If any evidence of irritation appears, the medications are stopped.

Most cases clear up entirely with potassium permanganate soaks alone or with these soaks followed by one of the dye medications mentioned above. A few enter the chronic stage characterised by thickened plaques of epidermis, scaling and fissuring. These lesions are resistant to treatment and characteristically relapse time and again. It is important to treat them cautiously because they are liable to flare up when irritated. A solution of from 1 to 7 per cent of iodine often gives good results. It is painted on the lesions twice a day. If no improvement with iodine takes place within two weeks or if the iodine irritates the lesions, other medications such as Castellani's paint or Whitefield's ointment are tried. Many weeks of sustained treatment elapse before the lesions heal completely.

*Castellani's Paint

Saturated alcoholic sol. of basic fuchs in	...	10·0
Aqueous solution of Phenol 5%	...	100·0
Filter and add		
Boric Acid	...	1·0
After two hours add		
Acetone	...	5·0
After two hours add		
Resproom	...	10·0

†Frazer's Solution

Salicylic Acid	...	2·0
Benzoic Acid	...	2·0
Tincture of Iodine	...	10·0
Spirits of Camphor to make	...	60·0

Keep in dark stoppered bottle.

Ointments are useful sometimes, but by and large they are best avoided in the tropics as they favour secondary infection. Whitefield's ointment is very valuable for softening up the dry scaling epidermis in the subacute and chronic stages. It is rubbed thoroughly into the lesions. No dressings are placed over it. It is never used in the acute stage or when secondary infection is present. Treatment is started with mixtures of a quarter to half strength in order to avoid irritation of the skin, and full strength is reached gradually. Sulphur ointment is useless in this disease. Ammoniated mercury proved mildly antiseptic but relatively ineffective against the fungi of epidermophytosis.

Dermatophytid on the hands and ears is a common complication of epidermophytosis of the feet or groin. It is characterised by vesicles, scaling eczematoid patches, fissures and varying degrees of erythema, and is very similar to other dermatoses. It is often more prominent than the primary lesion. The common error is to overlook the primary lesion and mistake the "id" for a specific separate pathological condition. The uncomplicated "id" will heal only when the primary disease is cured, therefore when confronted with such lesions it is important to look for epidermophytosis elsewhere on the body and to treat it as described above. The "ids" are treated symptomatically with mild medications. Potassium permanganate soaks are useful for drying up the oozing from broken vesicles. When there is much scaling and fissuring boric acid treatment or petroleum jelly is used to soften the lesions. When secondary infection is present it is treated as described above.

After the disease has been controlled and the patient is ready for resuming work he is rehearsed in the care of his feet with emphasis on the use of soap and water and foot powder. His shoes are fumigated by placing them in an air-tight container for twenty-four hours along with a sponge soaked in 30 per cent formaldehyde. They are then aired for 24 hours in sunlight. The patient is told that if recurrences take place he should report for treatment at once.

Dermatitis venenata.—The tropical forests abound in trees and plants which contain irritating substances. Contact with these substances produces conditions varying from transient burning and reddening of the skin to the severest forms of dermatitis in which all layers of the skin may get damaged. The very nature of the lesions greatly increases the chances of secondary infection unless special care is taken. Itching is usually intense and distressing to the patient. The following affords a good example of the difficulties in dealing with such cases:—

Mr. J. R., developed an area of burning and itching on the left wrist following contact with the black sap of the "Wannarla" tree (native name). Within a short time vesicles developed over the involved part. He was treated somewhere as an out-patient for nine days. Calamine lotion was first, applied, then tannic acid

ointment and then salicylic acid ointment. The disease continued to progress and appeared on the right hand. The patient was admitted to sick bay and treated with continuous soaks of potassium permanganate solution of unknown strength. Blebs, tenderness and swelling rapidly developed on both the hands. He was admitted into the hospital two weeks after the onset of the disease. On admission the backs of the hands and wrists were covered with vesicles and blebs, many of which were broken. Large areas were denuded of epithelium and were covered with shreds of epidermis and pus. The surrounding tissues were swollen and red. The axillary and epitrochlear lymph nodes were enlarged and tender. There was no fever present although a pyoderma and cellulitis had clearly become superimposed on the original dermatitis.

A strict aseptic regimen was immediately instituted. The hands were debrided of all loose epidermis and crusts. The tops were removed from the larger blisters. The skin was cleaned with sterile solutions. Continuous warm saline compresses were applied and sulphathiazole was given by mouth, two mg. immediately and then 1 gm. every four hours. In 24 hours the involved parts had become distinctly cleaner. Crusts and loose epidermis were carefully cleared away. The compresses were reduced to one hour twice a day, and sulphadiazine ointment was smeared generously over the lesions which were covered with sterile gauze. This treatment was continued for five days. There was marked improvement although a few islands of infection still remained. The sulphonamide was discontinued and 2% gentian violet in 70% alcohol was painted over the hands and forearms. In a short time several of the infected areas flared up. The gentian violet was stopped and warm compresses followed by sulphadiazine ointment were applied once again. In three more days, all evidence of infection had disappeared. Scattered spots continued to weep clear serum. These were touched with gentian violet every day until they healed. Gradually new epithelium grew over the denuded areas. Twenty-six days after admission the patient was discharged.

Many patients with dermatitis venenata admitted to the hospital exhibit severe skin damage. The condition of the skin is similar in many respects to a first or second degree burn and the same principles of treatment are to be followed. Absolute sterility and asepsis should be maintained in respect of the instruments, solutions and dressings used.

From the start, the diseased areas should be kept covered, protected with sterile gauze. The lesions are then carefully debrided of all crusts and loose epidermis. The tops of blisters are removed. The involved areas are cleaned with green soap, sterile water and alcohol and then covered with a sterile ointment spread thinly over. Boric acid ointment and petroleum jelly are both satisfactory for this purpose. Gauze impregnated with either ointment and autoclaved

affords a neat method for applying over these medications. The ointment not only protects the damaged skin from infection but also soothes the burning and itching that often cause great distress.

When secondary infection occurs, if it is a simple superficial one, the above regimen is usually sufficient. A sulphonamide drug is sometimes added to the protective ointment. Five per cent sulphadiazine in a water soluble base* is frequently used with excellent results. If a widespread pyoderma has developed with an underlying cellulitis and fever, more vigorous treatment is needed. The lesions are carefully debrided and cleansed as before. Warm saline compresses are applied for an hour every four to six hours. The moist compresses clear away the pus and crusts and also arrest the cellulitis. Between soaks the lesions are covered with dry sterile dressings. The compresses are continued until the infection is well controlled. Generally, twenty-four to thirty-six hours suffice. Ointment and gauze dressings are then applied as described above. The more severe cases require sulphathiazole or sulphadiazine by mouth. Two gm. immediately and 1 gm. every four hours for forty-eight hours and then 1 gm. four times a day till the infection improves. Sodium bicarbonate is given in equal amounts with each dose of the sulphonamide. At the first sign of any untoward reaction the drugs are stopped.

Medications which form eschars over excoriated surfaces have often been applied on a weeping dermatitis. The eschar may seal over an area of secondary infection and encourage its spread as in this case. The eschar had no effect on the course of the disease; a bland ointment and bandage, would have done better.

Itching is generally present in all stages of this disease. It causes great distress and is difficult to control. Scratching must be avoided as it causes secondary infection. In the milder cases with little excoriation of the skin, the lesions are treated frequently with an anti-pruritic lotion (*vide infra*) and covered with sterile dressing.

R	Phenol	...	2.0
	Glycerine	...	15.0
	Lime water	...	20.0

Ointments are also soothing and helpful against itching. Phenobarbitol, aspirin and codeine are used freely for relief of the pain and itching.

Corn starch and oatmeal baths relieve the intense itching, in some patients with extensive dry exfoliating lesions on the trunk and thighs. Baths are never used in the presence of secondary infection. One half to one pound of corn starch is ample for a 40 gallon tub of water. Warm baths are better tolerated than cold. Even in a hot climate patients become chilly if left in the tub for over thirty minutes. It has been found best to limit the procedure

* Water-soluble bases:—1. Aquifor. 2. Hydrogenated vegetable fat. Other ointment bases may be found in the Manual of Dermatology.

to twenty or thirty minutes and to repeat it two or three times a day.

Treatment of insect bites is directed towards relieving the itching. Antipruritic lotions and pastes though messy afford temporary relief, the following lotion is useful:—

R	Zinc Oxide	25.0
	Talc	25.0
	Bentonite or Kaolin	5.0
	Camphor	5.0
	Menthol	0.5
	Water	30.0
	Alcohol, 95%	30.0

Scratch-infections are common and are very resistant to treatment. They vary from small pustules to furuncles and ulcers. If the lesions do not heal after a week of dispensary care, the patient is hospitalized and given treatment suitable for secondary infections. The patient is put to bed. The lesions and surrounding the skin are cleansed well with green soap, sterile water and alcohol. If the infection is severe and cellulitis is present in the surrounding tissue, continuous hot saline compresses are applied for 24 hours. Then the lesions are covered with a sterile ointment. Adhesive tapes are avoided as they may initiate satellite lesions. If no improvement occurs in a week with the above treatment, a full course of sulphadiazine or sulphathiazole is given by mouth.

X-ray.—The results of X-ray therapy in a few chronic cases of epidermophytosis were disappointing. It was effective however, against the secondary infections. These can be managed by less risky methods and therefore, X-ray was not considered for routine treatment.

Conclusion.—The skin diseases commonly found in soldiers on active service in the tropics are epidermophytosis, dermatitis venenata and insect and mite bites. Secondary infections often complicate these conditions and necessitate prolonged hospitalization. Strong and irritating medications often aggravate the condition. Good general care, strict adherence to aseptic surgical technique, and the judicious use of local therapy are the most important factors in the treatment of these diseases.

Allergic Reaction to a Local Anæsthetic

Kroll reports an allergic reaction appearing as partial respiratory embarrassment, urticarial eruptions and itching affecting the whole body. The anæsthetic solution consisted of procaine, pontocaine and cobefrin. The reaction was promptly relieved by the I. M. administration of 1 c.c. of a 1:1000 solution of epinephrine. Which of three drugs or which combination of the three was responsible for the reaction, it is difficult to say. This case stresses the need for questioning patients regarding former experiences with local anæsthetics.—(*Jour. Oral Surg.*, p. 17, Jan. 1951.—(From *Amer. Dental News-letter*, No. 454, June 1951.

A REVIEW OF ABNORMAL LABOUR IN 1000 CONSECUTIVE DELIVERIES

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MATERNITY is the highest fulfilment of the biological function of woman. But gestation and its complications and particularly the process of childbirth cause grave anxiety to the woman, specially to the upper class ladies; many of them therefore, fight shy of motherhood.

This unnatural apprehension will, to some extent be mitigated by the present study of 1000 cases of confinement in which 90.4% ended in normal labour. It is to be noted that the hospital where the present study was made prefers the abnormal and difficult labours to the normal ones. The corrected figure for normal labour would evidently therefore, be more than 90.4% and abnormal difficult labours less than 9.6%.

In a series of one thousand (1000) consecutive deliveries there were 96 cases of abnormal and delayed labour; and 45 of them were forceps cases. Of the forceps cases, 33 were due to maternal exhaustion. In most cases maternal exhaustion was noticed in the comparatively older women. Other causes which indicated the application of forceps were, eclampsia (7); persistent occipito-posterior position (4); and high blood pressure (1).

The next cause of abnormal labour, in the order of frequency was still-births (total number in the present series was 24). Of the still-births, many were due to long delay in admission to hospital; many of the cases were brought from the mofussil in unsuitable conveyance. Dissolute life and consequent venereal infections were responsible for still-births in a considerable number of cases.

The third group of cases of abnormal and difficult labour indicating caesarean section numbered only 13 or 1.3%. Cephalo-pelvic disproportion was responsible for 7 cases, antipartum hæmorrhage for 3, placenta prævia for 2, and post-maturity for only one case of caesarean section.

The fourth group of abnormal delayed labour was due to breech presentation, numbering only eight. The common causes for this complication were:—Pelvic contraction (2); placenta prævia (2); twins (2); hydramnios (1); and foetal deformity (1).

The fifth factor responsible for abnormal labour was due to prematurity and accounted for only 5 cases in the 1000, the causes being toxæmia of pregnancy (1); multiple pregnancy (1); placenta prævia (1); accidental hæmorrhage (1); and no cause was discernible in one. Of course these figures for prematurity are decidedly lower here than in other countries where they are on an average from 4% to 10%, the lowest figure recorded being 2% in Queen Charlotte Hospital.

Lastly in the present series only one case of complex presentation was responsible for delay and difficulty in labour.

The following table shows at a glance the findings recorded above:—

Total finding	Percentage	Comparison with other countries
1. Forceps delivery due to:—		
(a) Maternal exhaustion	33	Persistent occipito-posterior 4%. Oxley (East End Maternity Hospital).
(b) Eclampsia	7	
(c) Persistent occipito-posterior position	4	
(d) High blood pressure	1	
Total	45	
2. Stillbirths		
Total	24	2.8% Munro Kerr and Moir. In England and Wales.
3. Caesarean Section:—		
(a) Cephalo-pelvic disproportion	7	New York Lying-in Hospital 2.2%. Johns Hopkins Hospital 5.2% white patients. 5.0 negro patients.
(b) Antipartum haemorrhage	3	
(c) Placenta praevia	2	
(d) Post-maturity	1	
Total	13	
4. Breech:—		
(a) Pelvic contraction	2	3%
(b) Placenta praevia	2	
(c) Twins	2	
(d) Hydramnios	1	
(e) Fetal deformity	1	
Total	8	
5. Prematurity:—		
(a) Toxaemia of pregnancy	1	4%—10%
(b) Multiple pregnancy	1	
(c) Placenta praevia	1	
(d) Accidental haemorrhage	1	
(e) No cause detectable	1	
Total	5	
6. Complex presentation	1	1%

I wish to express my sincere and grateful thanks to Dr. S. Sen Gupta, Registrar Eden Hospital. Dr. (Miss) B. B. Bhattacharji, M.B.D.T.M. M.B.C.O.G., Resident Surgeon, Eden Hospital Medical College. Dr. S. C. Bose, M.B. F.R.C.O.G. F.R.C.S., Professor of Clinical Midwifery, Medical College and Dr. Chakrobarty, M.B.F.R.C.S., Principal cum Superintendent, Medical College for their direction and help and also for the kind permission accorded to me to publish this paper.

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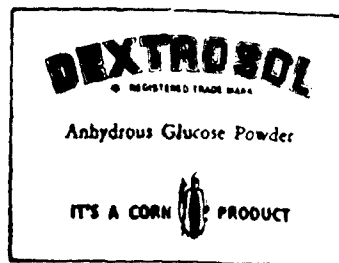
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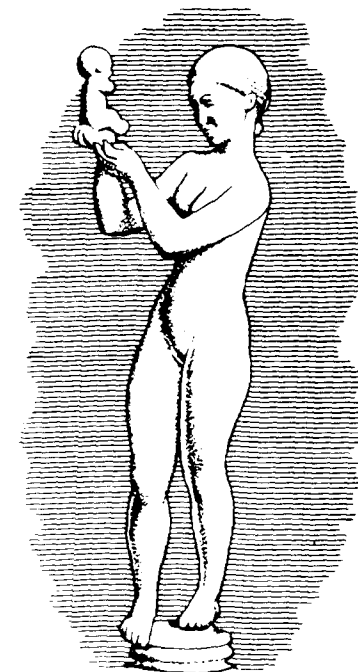
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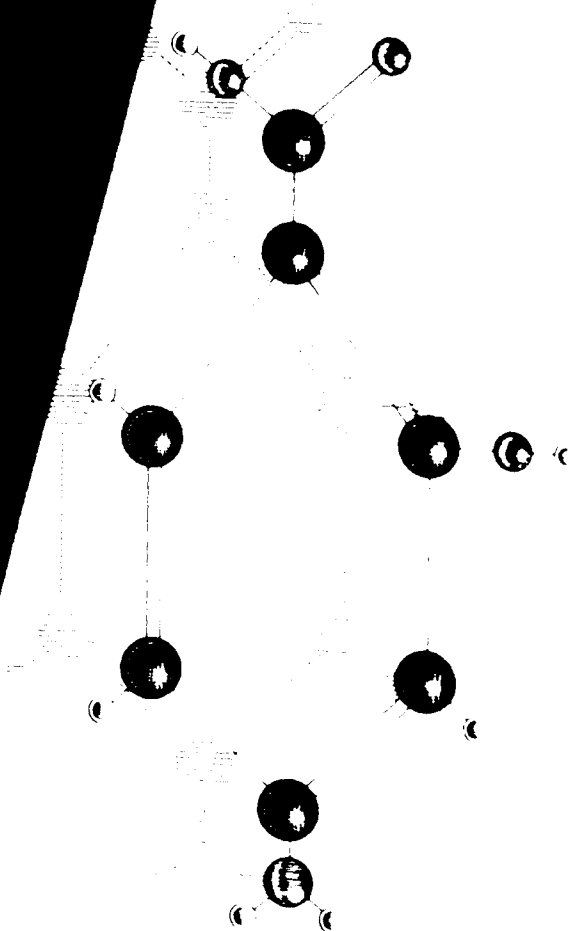
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CHEMOTHERAPY IN PULMONARY TUBERCULOSIS

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SINCE the discovery of the tubercle bacillus by Robert Koch in 1882, attempts have been made to find specific chemotherapeutic substances against the organism, without significant success. With the recent introduction of streptomycin and other chemotherapeutic agents, the outlook has entirely changed. An attempt has been made in this article to assess the present status of chemotherapy in pulmonary tuberculosis.

I. Tuberculin.—Tuberculin treatment has not fulfilled the high hopes entertained by Robert Koch in 1891. It was tried for some years in many countries and found wanting. When used injudiciously, it was also positively harmful. Tuberculin treatment has practically therefore, no place in modern chemotherapy.

II. Gold.—Koch in 1890 reported that simple gold salts were effective against the tubercle bacillus *in vitro* but had no protective action against guinea-pigs. Since then, various gold compounds have been tried. Gold therapy became popular in 1924 when Mollgaard claimed great success for sanocrysin in experimental animals as well as in clinical tuberculosis in the humans. It was advocated in exudative and fibro-caseous cases where toxæmia was mild or absent. But in view of its toxicity and uncertain effects, it was soon forgotten; this was possible because the more reliable and potent antibiotics came into use.

III. Streptomycin.—Schatz, Bugie and Wakesman in 1944 announced the production of streptomycin from *actinomyces griseus* and claimed that it inhibited the growth of *B. subtilis*, *B. tuberculosis*, *B. coli* etc. The initial clinical trials with streptomycin were confined to conditions, which had previously proved hundred per cent fatal *e.g.*, tubercular meningitis and miliary tuberculosis. Streptomycin treatment brought about a remission in a very large number of these cases. Some patients were pronounced also practically cured. Following the success of these early trials, patients suffering from different forms of pulmonary tuberculosis have been treated with streptomycin. Extensive controlled studies have been carried out in different parts of the world for purposes of large-scale clinical evaluation. Notable amongst these, are the studies in England by the Medical Research Council and those in the United States by the Veterans Administration (Council of Pharmacy and Chemistry, 1950) and by the American Trudeau Society. A wealth of information has accumulated which permits of certain broad generalizations.

Clinical experience:—Patients with progressive pulmonary tuberculosis often show under streptomycin therapy a prompt and

marked amelioration of their symptoms. There is a decrease in the pyrexia, in the sputum and in the number of tubercle bacilli in it; also a general improvement in the systemic manifestations of the disease. Disease which was previously progressive becomes quiescent, at least temporarily. This suppression of the acute disease process is uniformly noticeable during the first few weeks of treatment. The subsequent progress depends largely on the development of resistance of the organism to streptomycin. Some cases may show a reactivation of the disease soon after streptomycin is stopped or sometimes even during the course of streptomycin treatment, if the organisms get resistant to it. Streptomycin is not a specific, which cures pulmonary tuberculosis. It only prevents the rapid multiplication and growth of the tubercle bacilli in the tissues and thereby helps the defensive mechanism of the body to destroy them and to resolve the lesions caused by them. Hence streptomycin therapy is only an adjuvant to other essential methods of treatment such as bed-rest, adequate nourishment, hygienic regime and where indicated collapse therapy or other surgical measures.

Indications:—The indications for the use of streptomycin in the treatment of pulmonary tuberculosis may be summarized as follows:—

(1) The more acute the disease, the greater the likelihood of streptomycin being very effective. This is partly because of the ready accessibility of the drug at the early stage of the disease to the affected tissues through the blood. With more caseation the affected tissues become partially or wholly impermeable to streptomycin due to impaired blood supply. The chief indications for streptomycin therapy in pulmonary tuberculosis are the miliary form of the disease, rapidly extending pulmonary infiltration and ulcerative tracheo-bronchitis.

(2) If streptomycin is to be used in more chronic cases the object must be clearly defined. In advanced cases of pulmonary tuberculosis with extensive cavitation, streptomycin may be used only to improve the condition of the patient to enable a surgical measure like thoracoplasty to be done which could not otherwise have been undertaken without grave risk.

Therapeutic limitations of streptomycin.—(1) *Toxicity:*—Streptomycin can produce certain toxic side-effects. The most important of these is dysfunction of the vestibular apparatus. The auditory function is impaired in certain cases when large doses of streptomycin are continued over prolonged periods. Other toxic manifestations are erythematous rash, fever, eosinophilia and abnormal urinary sediments.

(2) *Streptomycin-resistance:*—During streptomycin treatment, the more sensitive bacilli are gradually inhibited and eventually eliminated while the more resistant bacilli continue to propagate.

Finally even if treatment is continued, there occurs a gradual replacement of the original flora by the streptomycin-resistant tubercle bacilli.

(3) *Anti-bacterial potency:*—Streptomycin only causes the suppression of the normal pathogenic activities of the tubercle bacilli in tuberculous infections. Streptomycin *per se* does not cause sterilization of the infective agents.

Dosage:—Toxicity and resistance are the two important factors which determine the length of treatment and adequate dosage. Streptomycin was formerly given empirically for 120 days. In order to lessen the incidence of resistance, the duration of treatment has now been reduced to 60 days and this has not caused any reduction in the efficacy of the treatment with streptomycin. A further reduction to 42 days has been advocated to reduce the incidence of resistance still further. Regarding the daily dosage, the present-day-tendency is to reduce it from 2 gm. to 1 gm. or even to 0.5 gm. This prevents toxic reactions to a considerable extent.

Reduction in incidence of streptomycin resistance:—The most important problem in the use of streptomycin in tuberculosis is the development of resistance. Further treatment with streptomycin of the patient or of any one else who may get infected with the resistant strain would be of no avail. Several instances of infection of contacts of treated cases with the streptomycin-resistant bacilli have been recorded. The following measures are useful in reducing the incidence of emergence of streptomycin-resistant strains.

(1) Shortening the course of therapy for pulmonary tuberculosis to 6 weeks.

(2) Combination of two or more anti-mycobacterial agents. It has been established by the Medical Research Council and by several other investigators that combined therapy with streptomycin and PAS prevents or at all events delays the development of streptomycin-resistant strains.

Intermittent treatment with streptomycin has also been tried. In a study organized by the Veterans Administration in 1950, Hughes reported 102 cases where 1 or 2 gm. of streptomycin was administered every three days and 12 gm. of PAS was given daily. None of the 102 patients developed bacillary resistance after 120 days. Later reports state that streptomycin treatment may well be intermittent but PAS must be given continuously.

(3) *Selection of cases:*—Two points have to be noted in selecting cases. Patients who have definite pulmonary cavitation are more prone to develop resistant strains than those without cavitation. Patients who start treatment with a high bacillary count in their sputum also show a greater tendency to develop drug resistant strains than those with fewer bacilli in the sputum.

IV. Dihydrostreptomycin.—Dihydrostreptomycin is similar in its therapeutic effect to streptomycin but is less toxic.

V. Neomycin.—About 2 years ago Wakesman and Lechevalier announced the discovery of neomycin. Extensive studies with neomycin have brought out the following facts.

1. Neomycin is more active than streptomycin against the human and bovine strains of the pathogenic mycobacterium tuberculosis.

2. Neomycin is active against both the streptomycin-resistant and sensitive strains.

3. Neomycin favours the development of resistant-strains to a far less extent than streptomycin.

4. Neomycin shows a relatively low toxicity in animals and has a high therapeutic index.

VI. PAS.—Following Berheim's report in 1940 that salicylic acid stimulates the metabolism of tubercle bacilli, Lehmann discovered the beneficial effect of PAS both *in vitro* and *in vivo* against the organism. After the confirmatory trials by Vallentin at Gothenburg and other workers elsewhere, the Therapeutic Trial Committee of the Swedish National Association against Tuberculosis, conducted large-scale co-operative studies on the American pattern. The study was carefully controlled and the beneficial effects of PAS in different forms of pulmonary tuberculosis were clearly demonstrated statistically. The effectiveness of PAS alone has also been well brought out in the investigations initiated by the British Medical Research Council and also by various other independent workers.

Clinical experience:—Best results with PAS are obtained in the exudative and toxic forms of pulmonary tuberculosis. Within a few weeks of the initiation of the therapy, the toxæmia as evidenced by pyrexia, raised erythrocyte sedimentation rate and tachycardia begins to lessen. The appetite improves, the cough and sputum get diminished and the patient often feels generally better. The tubercle bacilli in the sputum, grow less and may ultimately disappear altogether. There is improvement in the radiological appearance *e.g.*, proliferative changes in the originally exudative foci and also often a reduction in the size of the pulmonary cavities.

Dosage:—Absorption from the alimentary tract is rapid and so also is the urinary excretion and hence the drug should be given at frequent intervals. Attempts to delay the excretion of PAS have not so far been successful. The recommended daily dose varies from 10 to 30 gm. The drug may be given continuously or with intermissions, *e.g.*, six days' medication followed by one day's interval. PAS can well be continued for several months. Quite recently, PAS has been given intravenously with gratifying results.

Toxicity:—PAS is free from any serious toxic effect. Mild gastro-intestinal symptoms such as nausea, vomiting and diarrhoea

may arise particularly when treatment is started but are not usually serious enough to warrant a suspension or discontinuance of the treatment. Administration of the drug in the form of its sodium salts or as entero-coated granules, and the simultaneous administration of alkalis or dilution of the drug with a large amount of fluid, often help to reduce the symptoms of gastro-intestinal irritation.

Long continued PAS treatment may cause a tendency to acidosis, especially in children. The prothrombin content of the blood may be slightly lowered during the course of treatment, but this is not very significant clinically. Cardiac symptoms have been reported with the sodium salt of PAS. Nagley attributes it to potassium deficiency caused by the sodium salt. Allergic and febrile reactions are rare. When such symptoms do arise, they disappear with the discontinuance of the treatment. After a few weeks it may be possible to resume treatment with gradually increasing doses without causing such symptoms. Hæmaturia and albuminuria have also been noted, but only rarely.

Resistance:—The emergence of PAS-resistant tubercle bacilli has been reported but the resistance develops to a much less extent and very much later than with streptomycin. PAS has been found effective against streptomycin-resistant organisms. As already noted the combined treatment with streptomycin and PAS delays the emergence of streptomycin-resistant organisms considerably.

INDICATIONS:—The following generalisations can be made regarding the use of PAS in the treatment of pulmonary tuberculosis.

(1) PAS is most effective in the acute exudative type of pulmonary tuberculosis, particularly in toxic febrile patients.

(2) Whenever streptomycin treatment is being given, PAS should be given conjointly (a) to retard the development of resistance to streptomycin; and (b) to enable the patient to benefit by the synergistic activity of the two chemotherapeutic agents.

(3) Patients who have become resistant to streptomycin or who cannot tolerate streptomycin can be treated with PAS alone.

(4) Treatment with PAS has often the important effect of making patients fit for collapse therapy.

(5) It has been advocated to reduce the bacterial flora in tuberculosis patients who are being prepared for surgical operations. It can also be used in arrested cases of pulmonary tuberculosis to prevent a flare-up during respiratory infections.

(6) PAS is also advocated in patients awaiting admission into a sanatorium. Apart from individual improvement, there will often be a social gain by a decrease in the number of acid-fast-bacilli in the sputum.

VII. Thiosemicarbazones.—Mertens and Bunge reviewed the results of treatment of over 10,000 patients in Germany with

different forms and in different stages of pulmonary tuberculosis with Conteben (4-acetylaminobenzaldehyde thiosemicarbazone), one of the most active agents against tubercle bacilli in this series. More than 60 authentic clinical reports from various investigators were gathered and studied in detail. The authors came to the conclusion that Conteben caused a rapid resolution in recently developed exudative pulmonary tuberculosis. There was prompt improvement in the general condition, increase in appetite, often an astonishing gain in body-weight and a gradual return of the temperature to normal. Sputum-conversions and cavity-closures were also noticed in some cases. Skiagrams showed recession of infiltrations. In the chronic productive type of pulmonary tuberculosis, however, Conteben is contra-indicated. Tracheo-bronchial and other forms of mucous membrane tuberculosis, also respond well to this treatment. The result was not satisfactory in miliary tuberculosis.

DOSAGE:—The form and the stage of the tubercular process and the individual tolerance of the patient are the factors which determine the suitable dosage. A small initial dose of 12.5 to 25 mg. per day is recommended. It should then be gradually increased. The average daily dose is 2 mg. per kg. of body weight and the upper limit is generally considered to be 200 mg. per day. Most workers consider that treatment should extend over a period of 3 to 12 months.

Toxicity:—The common toxic manifestations are: gastric irritation with anorexia, nausea and vomiting, skin eruptions often preceded by conjunctivitis, blood dyscrasias, such as hæmolytic anaemia and granulocytopenia and sometimes also liver damage and encephalopathy. With due care in dosing, some of these toxic symptoms may be avoided. It should be noted that the drug is potentially more toxic than either streptomycin or PAS.

Resistance:—The possibility of tubercle bacilli developing resistance against thiosemicarbazones has not yet been fully investigated. Auersbach and Schutz believe that thiacetazone-resistant strains may occur, which will naturally be then resistant also to other thiosemicarbazones.

It would appear that streptomycin, PAS and thiosemicarbazones have different modes of action against the tubercle bacillus. The possibilities of an effective combination of these are therefore, obvious. Just as streptomycin and PAS in combination possess certain distinct advantages, so may also thiosemicarbazones in combination with one or both of them. This would require elucidation by further controlled experiments. Karlson and his co-workers have recently suggested that streptomycin combined with thiacetazone is more active than either drug used alone. It would be interesting to see if thiosemicarbazones like PAS when administered with streptomycin, delay or prevent the emergence of streptomycin-resistant strains.

VIII. Sulphonamides.—The value of the sulphone compounds such as Promin, Diazone and Promizole has been carefully investigated. They are considered too toxic to be used in clinical tuberculosis. They might have some action in delaying the development of streptomycin-resistance but are of little or of no value *per se*.

IX. Cepharanthin.—Claims have been made in Japan that the roots of *Stephania cepharanthia* are effective in the treatment of tuberculosis, leprosy and whooping cough. This action is attributed to cepharanthin, one of four alkaloids present in the root. Independent trials in animals by Feldman have shown that it is of no value in tuberculosis.

X. B. 283 and B. 390.—These substances were elaborated by Barry and his collaborators at Dublin after work on derivatives of lichens found to resemble chaulmoogra oil. B. 283 is active *in vitro* in the presence of serum and has a suppressive effect on tuberculous disease in guinea-pigs. The results have not however, been as good as those with streptomycin. In human beings it has been tried with success in renal tuberculosis and in leprosy. Conclusive results of value have not yet been obtained in the treatment of human pulmonary tuberculosis.

Summary.—The present status of chemotherapy in pulmonary tuberculosis has been discussed. The last decade has witnessed considerable progress in this direction. The vulnerability of tuberculous infections to chemotherapeutic attack has been established experimentally and clinically.

Tuberculin and gold have practically gone out of vogue.

Streptomycin continues to be the drug of choice, being the most effective chemotherapeutic agent known so far. It has however got its limitations. The decision to use streptomycin in a case of pulmonary tuberculosis should be taken only after mature consideration. It should not be considered as a specific cure for pulmonary tuberculosis, and should be used only as an adjuvant to other essential methods of treatment.

The value of Neomycin is still under investigation and trial.

PAS is another powerful chemotherapeutic agent, not however as effective as streptomycin. The present tendency is to use PAS conjointly in all cases of streptomycin-therapy with the object of delaying the emergence of streptomycin-resistant organisms and taking advantage of the synergistic activity of the two chemotherapeutic agents.

Thiosemicarbazone is another chemotherapeutic agent but probably less effective than PAS. The drug is somewhat toxic. The possibility of an effective combination of thiosemicarbazone with other chemotherapeutics requires careful controlled trials, before being considered for adoption.

Sulphones have so far been found to be too toxic to be used in clinical tuberculosis. Claims on the effectiveness of Cepharanthin lack adequate confirmation. B. 283 and B. 390 are also only in the experimental stage

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Significance of Penicillin-Resistance Staphylococci

Clinical failures because of the appearance of drug-resistant micro-organism constitute one of the challenging problems of modern chemotherapy. It is well established that this resistance is not of a temporary nature and resistant organisms are just as invasive as the sensitive parent cocci. This biologic feature of resistance to penicillin which persists from generation to generation without loss of invasiveness is of extreme importance in the epidemiology of staphylococcal infections and can be correlated with the increasing incidence of therapeutic failures with penicillin. An increase in the incidence of penicillin-resistant staphylococci has been reported also from Australia, France and Austria. Dr. Spink of the Minnesota University Hospital, found that the incidence of these highly resistant strains was increasing at an alarming rate, in the Minnesota (U.S.A.) hospitals. Approximately 12 per cent. of the strains of staphylococci isolated from patients were found to be naturally resistant to penicillin in 1942. But over 50 per cent of strains isolated in the latter part of 1949 and early months of 1950 were highly resistant to penicillin. This demonstration of penicillin resistance *in vitro* has been correlated with the therapeutic failure and coincides with the experience of others.

Comparative *in vitro* tests with penicillin, streptomycin, aureomycin chloramphenicol and terramycin demonstrated that more strains of staphylococcus were sensitive to aureomycin than to each of the other antibiotics. Further clinical trials with chloramphenicol, terramycin and combinations of antibiotics are desirable. —(Jour. Lab. Clin. Med., 37, 2, 1951).

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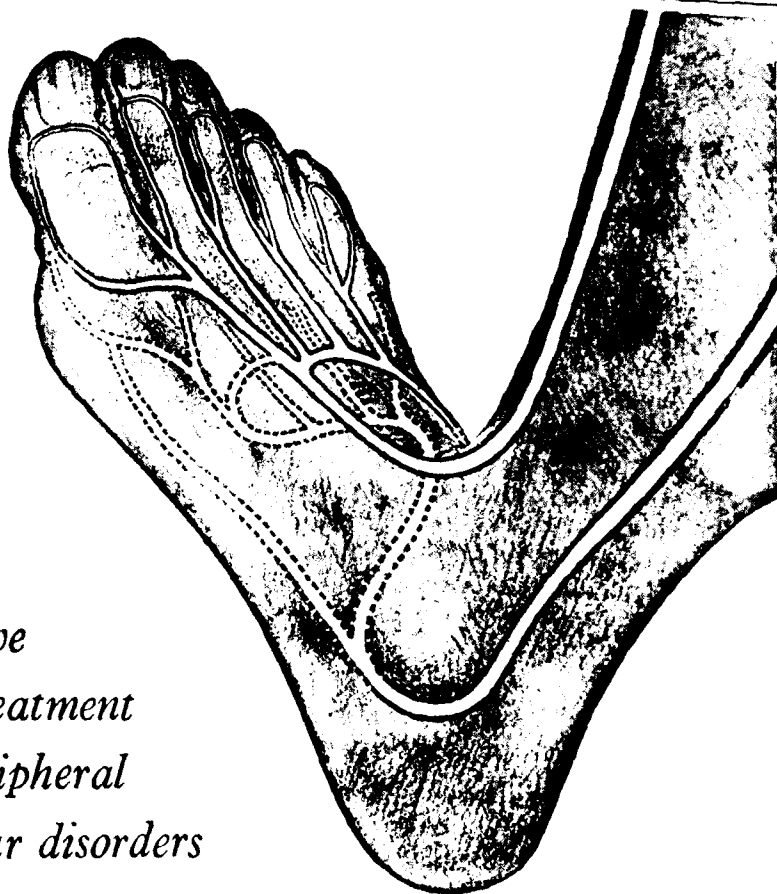
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A SYNERGISTIC AUTO-SERUM, PENICILLIN AND SULPHATHIAZOLE

TREATMENT FOR TYPHOID FEVER

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WITH the introduction of the 'Sulpha-drugs' and of the increasing number of antibiotics, the time-honoured curative agents, *e.g.*, sera and vaccines in the treatment of infections are fast becoming 'things of the past.' Physicians now find much less need for serotherapy than formerly but it is perhaps too early to discard tried and proved remedial measures as having outlived their usefulness because the 'Wonder drugs' are performing clinical miracles.

It is amazing how a single c.c. of normal rabbit serum might destroy several thousands of virulent anthrax bacilli, *in vitro* and yet a few hundreds of these bacilli, if injected into the blood-stream of a rabbit kill the animal in a day or two.

Still more amazing is the phenomenon that in spite of the presence of abundant antibodies in the blood of a patient in the course of an infection they may remain there absolutely inactive. But if a quantity of this blood is drawn and allowed to coagulate outside, the resulting serum directly becomes an auto-serum, charged with specific antibodies eminently suitable for passive immunization or for curative purposes.

The auto-serum is easily prepared by drawing the required quantity of blood from the patient by venepuncture into a small sterile flask and leaving it in a cool (preferably on ice) dark place for a few hours to coagulate. Two to three c.c. of the resulting serum is an average adult dose which may be injected subcutaneously once a day, for three or four days. One point to be remembered here is that the antibodies take time to form, in infections like typhoid fever and therefore the proper time for collecting the blood for auto-serum is after the first week of the illness.

While working in a large Infectious Diseases Hospital, when no other drug-treatment than diaphoretic or chlorine mixture was available for typhoid fevers, the writer had the opportunity of employing auto-serum (prepared as above) fairly extensively, often with striking results. This method of treatment not only shortened the febrile period of the infection to an appreciable extent, but also greatly reduced toxæmia and complications. If it did nothing else, the auto-serum shifted the lingering residual temperature of the infection.

The purpose of this article is to suggest a synergistic auto-serum penicillin-sulphathiazole treatment for typhoid fevers. The original idea of a penicillin-sulphathiazole treatment for typhoid fever emanated from Bigger and McSweeney, and mine is only a

modification in which the patient's own serum (passive immunization) is also brought in, to act in synergy.

It may be asked why try all these cumbersome methods when Chloromycetin and other antibiotics have come to stay and are infallible cures for all infections. This is only like asking, why employ those cumbersome army, navy and air forces in modern warfare when a small atom-bomb could go into action and end the war in a few hours, leaving no trace of human life on enemy ground. In medicine, a satisfactory second line of treatment should always be welcomed as an asset, particularly if it happens to be less expensive, and equally efficient.

The line of treatment suggested is as follows:—An adult patient seen in the first week of typhoid fever is given 5 standard tablets of sulphathiazole a day—2 to start with and 1 every 4 hours—for 4 days with plenty of fluid-intake and adequate quantities of vitamins C and B. The chemotherapy at this stage of the disease is not expected to deal direct destruction to the offending *B. typhosus*, but may curb the vicious activities of the infecting micro-organisms, in the intestines or in the respiratory tracts. After this course of sulphathiazole, ordinarily the patient is left without any active treatment (except vitamins) for three days. But if the patient is constipated and a bowel action is desired especially with a view to getting rid of a few dead or dying round-worms (a very common complication in tropical countries) suitable treatment may be given for this.

The regular synergistic treatment which is a four-day course, is instituted directly after the interval if the patient had been receiving the preliminary sulphathiazole treatment in the first week, or at any time after the 8th day of illness. The patient is given 5 tablets of sulphathiazole a day in four-hourly doses as before. He also gets an injection of 3 lakhs of repository penicillin in the morning and 2 to 3 c.c. of his own serum (auto-serum) in the afternoon. The best way to get the serum ready for the afternoon injection is to draw the blood (6 to 8 c.c. will do) in the morning and leave it for serum-separation as described above.

The auto-serum is important. Aside from its specific role, its protein-shock value is considerable in stubborn infections. It is absolutely harmless and is superior to auto-hæmic injections.

The over-worked general practitioner who is not used to laboratory techniques may feel that serum-making is tedious and troublesome but in our great and humanitarian work nothing that will prove beneficial to suffering humanity, should be deemed so. I have treated a few cases, perhaps not sufficient to draw definite conclusions but my impression is that the results have been very gratifying.

A SHORT NOTE ON THE THERAPY OF VENEREAL GRANULOMA WITH AUREOMYCIN AND CHLORAMPHENICOL

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A NUMBER of reports have been appearing in the American medical literature on the beneficial therapeutic effects of the newer antibiotics, Aureomycin, Chloramphenicol, and Terramycin on the lesions of venereal granuloma (Greenblatt *et al*¹, Robinson and co-workers², and Wright *et al*³.) In a disease like venereal granuloma with a tendency for apparent immediate healing, only to recur subsequently, it is premature to assess the ultimate status of these antibiotics in effecting a radical cure of the disease; but with streptomycin still leading, we have added these newer antibiotics to our therapeutic armamentarium.

The one great advantage of the newer antibiotics is that they can be administered orally. But their prohibitive cost militates against their extended and liberal use in a disease like venereal granuloma, the public health importance of which should not be reckoned in terms of the expenditure involved; in the present poor economic financial state of our country and particularly when it is remembered that the large majority of patients suffering from this disease come from the under-privileged section of the population, the cost of these valuable but expensive drugs will have to be faced. It is our impression that streptomycin will continue to be the standby in the routine treatment of venereal granuloma with one or the other of the newer antibiotics as a second line of therapy and an alternative in streptomycin-resistant cases. The knowledge that there are four antibiotics available now, for the successful treatment of the disease gives hope to the physician that venereal granuloma, a disease which is strictly limited in its epidemiology and geographical distribution can be completely wiped out if an all-out concerted attack on the disease is launched.

This report deals with the results of our treatment of thirty one patients suffering from venereal granuloma, with aureomycin and chloramphenicol, during a period of 8 months from 2-5-'51 to 1-1-'52. Messrs. Lederle Laboratories Division of the American Cyanamid Company and Parke Davis and Company were kind enough to supply us with sufficient quantities of aureomycin and chloramphenicol for clinical trial. Both the drugs were administered to unselected cases of venereal granuloma as they presented them-

selves at the V. D. Clinic of the Government General Hospital, Madras.

Aureomycin.—Nine adult males and 4 adult females were treated with the drug. The duration of the disease varied from one month to six years. The distribution of the lesions was mostly on the genito-inguinal and anal regions except in one who suffered from lesions over the genitals, mouth and neck. Prior to starting treatment, the clinical diagnosis was confirmed by bacteriological demonstration of *b. Donovaniana granulomatis*. A dosage schedule was empirically adopted which consisted of 500 mg. administered orally every six hours round the clock to a total dosage of 20 gm. during a period of ten days. The average time taken for the disappearance of the organisms from the tissue-spreads was ten days and for the lesions to heal thirty-six days. The results in 11 cases were very satisfactory. Two aureomycin-resistant cases of which one was also streptomycin-resistant, were ultimately cured with chloramphenicol. The other aureomycin-resistant case was cured with streptomycin.

Chloramphenicol.—Thirteen adult males and 5 adult females were treated with chloramphenicol. The same schedule of dosage and duration of treatment were adopted as in the treatment with aureomycin, *supra*. The duration of the disease in this group varied from three months to five years. Eight of the 18 patients were old cases of venereal granuloma unsuccessfully treated with antimony compounds. The distribution of the ulceration was more or less similar to that of the aureomycin-treated group. The average time taken for the disappearance of the organisms in the tissue-spreads was eight days and for the lesions to heal was eighteen days. In this group are included 2 patients, one who was both streptomycin and aureomycin-resistant and the other a case of experimentally-induced venereal granuloma who was resistant to streptomycin but responded to chloramphenicol.

Toxic reactions.—The almost complete absence of any toxic side-effects in patients treated with chloramphenicol is in contrast to the frequency of toxic reactions in aureomycin-treated patients. Nausea, vomiting, colicky pains, diarrhoea, unaccountable sweating were disturbing features among the aureomycin-treated patients. There was one patient who became really ill with repeated vomiting and diarrhoea, and severe abdominal cramps leading up to a condition of partial collapse. The treatment had to be interrupted and finally discontinued in this patient.

Conclusions.—1. The immediate bacteriological and clinical results of therapy with the two antibiotics may be deemed to be satisfactory.

2. Follow-up studies are in progress to assess the permanence of the results obtained.

(3) As between the two antibiotics, it would appear that chloramphenicol is therapeutically more effective and also less likely to cause toxic reactions.

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Diuretic Effect of Vitamin B₁₂

Barnard and Wertzner reported in 1949 that single injections of 45 to 75 microgrammes of vitamin B₁₂ caused unequivocal increase in the urinary output in 12 out of his 16 patients with normal blood pictures. Dr. Bedford of Cowley Road Hospital, Oxford, investigated this claim in 37 patients with normal blood pictures, (2 normal adults, 2 women with chronic nephritis, one adult man with nephrotic syndrome, 30 patients in congestive heart failure with generalized oedema and two adult men with generalized oedema due to cirrhosis of the liver). A simple low diet was carefully maintained for the 14-day trial-period. This diet provided over 650 mg. of sodium per day and allowed a free intake of fluid. After three days on the low-sodium diet 5 cc. of 'Cytamen' (Glaxo) equivalent to 100 microgrammes of vitamin B₁₂ was injected intramuscularly at 6 a.m. 3 days later 3 gm. of ammonium chloride was given by mouth at night, followed at 6 a.m., the next morning by 2 cc. of mersalylum B.P., intramuscularly. After another 3 days the whole experiment was repeated. It was found that vitamin B₁₂ had no significant diuretic effect on subjects with normal blood pictures and therefore had no place in the management of generalized oedema. Dr. Bedford pleads for the establishment of a 'Therapeutic Trials Committee' in England to test and give authoritative pronouncements, confirming or refuting claims of success with certain drugs. This he says, would prevent much wasteful expenditure of time, money and material.—(*The Lancet*, 2-6-1951, pp. 1232-33).

The Effect of Benemid on Plasma Penicillin Levels

Since the advent of widespread penicillin therapy it has become evident that some method of enhancing the concentration of penicillin in the blood would represent a therapeutic advantage. Because of the apparent advantage of benemid (average dose 2 gm. daily) a new compound of benzoic acid, over carinamide, it was tried in 15 cases in the Salt Lake Country General Hospital. All cases were below 45 years of age and none had renal disease. All received crystalline penicillin G intramuscularly every 8 hours. Dose was 200,000 units per injection. Benemid was administered orally in varying doses at varying time intervals.

Frequent estimations of plasma penicillin levels indicated that higher levels were to be expected during the period of Benemid administration than in control periods.

No toxic reactions to this drug were encountered. Benemid would appear to be a useful and effective agent for enhancing plasma penicillin levels.—(*J. Lab. Clin. Med.*, 37, 2, pp. 272-275, 1951).

MODERN THERAPY AND THE GENERAL PRACTITIONER

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THOUGH the word 'modern' relates only to time, conventional usage would make it comprise everything that is latest, newest and best in every sphere of life. It should however, be remembered that all that is recent and new need not necessarily be the best, nor all that is the best be quite recent or new.

Therapy means "treatment intended to cure." It may be classified into four main groups:—

I. Psychotherapy, dealing with the forces of mind and treatment by suggestion.

II. Pharmacotherapy, or treatment by drugs; the drug may be of vegetable, animal or mineral origin, natural or synthetic.

III. Physiotherapy which deals with the treatment of disease by physical agents, such as heat, light, cold, water, electricity, massage and mechanical agents.

IV. Surgery, which entails operative procedures, including mechanical manipulation.

The therapists can also be likewise classified into: (1) Research workers, who are responsible for finding out the rationale; (2) Specialists or technicians, who limit the exercise of their skill to particular diseases; and (3) General practitioners, who constitute the largest group and extend their activities over a wide sphere and also labour under some handicaps and limitations. The G.P. has to shoulder the responsibility of utilising the modern methods of therapy with precision, to the best advantage of the patients. The G.Ps. may be classified again into 4 groups: (1) those who are up-to-date in their knowledge of medicine etc. and are also well equipped; (2) those with poor knowledge and poor equipment; (3) those with good knowledge but poor in equipment; and (4) those with poor knowledge and gaudy equipment. Let us take the average G.P. who has average fair knowledge and a fair equipment and assess how best, he can turn modern therapy to his and to the patient's advantage.

I. Psychotherapy will be taken first: Freud, the Jewish genius, was responsible for modernising this form of therapy, which in days of old was empirical and crude. It was improved and systematised by Freud's followers. It is applicable to a very large number of cases, which may fall into three groups:—

1. *Psycho-surgery* indicated in well advanced cases can be undertaken only by special surgeons with experience and skill. This cannot be undertaken by the G.P.

2. *Specialised psychotherapy* is indicated in cases not so far advanced as the above; and a knowledge of varied and different

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techniques for hypnosis, narcosis, shocks etc. is indispensable. This should be carried out by specialists, in well-equipped hospitals. This has also therefore, to be ruled out of court for the G.P.

3. *Psychosomatic therapy* is indicated in minor ailments, in which the effects on the psyche (mind) and physique (body) overlap each other. These cases are indeed numerous in modern times, as shown by Freud in his "Modern civilisation and its discontents" and offer a very fruitful field for the G.P. Comparatively little equipment, a great deal of patience in studying the symptoms and above all plenty of common sense in assessing the psychic and somatic troubles, are all that will be required of the G.P. But unfortunately, the G.P. while at College, is taught this subject very casually, and when he starts practice he has an eye to the main chance, rather than to this aspect of medical treatment. Few G.Ps. realise that in this line they can show their skill and establish a reputation and prestige, as also a flourishing business. They therefore, resort to the wide field of pharmacotherapy. These G.Ps. might incidentally and unwittingly become responsible for increasing the number of psychic patients on account of the insidious side-effects of the potent drugs used by them on their patients.

II. Pharmacotherapy.—This is usually the mainstay of the G.P. The G.P. has ceased to be his own pharmacist as in the olden days. Pharmacy is a modern speciality, and in this new field a great many research workers, have striven to enrich the *Materia Medica* with new organic and inorganic remedies of a very complex nature and outstanding value, e.g., antibiotics, sulpha drugs, vaccines, sera, etc. The literature accompanying these, based on prolonged trials in the laboratory and/or in hospitals, are very helpful. But the danger lies in the distributors, some of whom overshoot the mark and claim fabulous and phenomenal results in their advertisements and their interviews with the G.P. The manufacturer's representatives often assume the role of advisers to the G.P., as to what to use and how he should use it.

We often find some G.Ps. making out prescriptions having a number of drugs more than one of which have the same action. This free-lance polypharmacy has its disadvantages. Half a century ago good doctors treated serious cases successfully with only two or three drugs. The modern therapist only takes into consideration the gross action of a drug. Modern research workers like Bier (1925), Carrel (1935) corroborate this view, but the rage for polypharmacy and the contempt and neglect for the finer actions of drugs are too strong in the G.P. of modern times. Individual idiosyncrasies in patients, should be carefully watched in selecting and administering drugs. In addition to the discriminate use of drugs, modern therapy should devote greater attention to dietetics.

III. Physiotherapy.—Another well-developed section of modern therapy often neglected by the G.P. is physiotherapy which utilises hot and cold baths, tub-baths, oil-massage, fomentations etc. In the tropics, the G.P.s. advice that a rickety child should be left in the morning sun or have ultra-violet irradiation sounds queer. Infra-red irradiation or diathermy is no doubt of value in some cases but should not be advised for all cases—in the attempt to look up-to-date or modern.

IV. Surgery.—Finally comes surgery, wherein vast and rapid strides have been made in all directions. This is manifestly not the sphere for the G.P. to indulge in. Still some G.P.s. have to try some surgical procedures, under certain pressing circumstances, especially in remote places very far removed from well-equipped hospitals or in the absence of surgeons in the vicinity. Obstetrics *au fait* with modern surgical technique and with anaesthesia, sterilisation, prompt parenteral administration of suitable drugs at the proper time. Vasectomy is another useful minor operation he may have to do in the mofussil.

Thus, by a judicious use of his intelligence, patience and professional skill and of the modern therapeutic methods, the G.P. can raise his professional status and greatly help to relieve human suffering in this poor country of ours.

Cortisone Contra-indicated in Tuberculosis

Michael, Cummings and Bloom carried out controlled experiments on tuberculous animals. Albino rats are highly resistant to tuberculosis. After an injection with virulent human tubercle bacilli no gross or microscopic lesions developed, inspite of the fact that the bacilli could be cultivated from their tissues 120 days after inoculation. By injecting cortisone, this power of resistance is reduced or destroyed. Groups of 20 rats were intraperitoneally injected with 2 to 4 mg. of a young active culture of *M. tuberculosis*. Half of each group was given daily injections of 5 mg. cortisone during the experiment. All the control animals, given *M. tuberculosis* culture alone survived by the end of the experiment (42 days); of those given cortisone, only 10 per cent survived. In a second experiment, 100 per cent of the animals given *M. tuberculosis* alone survived (52 days) while 30% only survived amongst those which received *M. tuberculosis* and were treated with cortisone. Histological examination showed that under the influence of cortisone, tubercle bacilli are able to multiply more rapidly than in control rats and can produce more diffuse lesions. Michael *et al.*, therefore, state that great caution should be exercised in the administration of cortisone to patients with tuberculosis.—(*Proc. Soc. Exp. Biol. Med.*, 75: 613, 1950.—*J. A. M. A.*, Editorial, p. 907, 24.3.51).

SOME CLINICAL OBSERVATIONS ON THE USE OF KHELLIN IN CARDIO-VASCULAR DISEASES

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KHELLIN is the crystalline active principle extracted from the seeds of *Ammi Visnaga*, an Eastern Mediterranean plant.

Standardization is based on the fact that Khellin produces a characteristic pink colour when added to solid potassium hydroxide.

Khellin causes prolonged relaxation of all smooth muscles, *e.g.*, intestinal, uterine, bronchial and biliary muscles and has an "especially marked effect on those of the ureters and coronary vessels" (G. V. Anrep, G. S. Barsoum, M. R. Canaway, and G. Misrahy, of Cairo).

Khellin produces sustained vaso-dilation with no alteration in blood pressure or myocardial oxygen requirement; it is not contra-indicated in cases of hyper-tension.

Khellin relaxes the smooth muscle in various organs *in situ* and also in isolated structures such as the ureter.

It has prolonged action and remains in the circulation for many hours. Its action in dilating the coronary arteries was found to be at least four times more powerful than that of aminophyllin and so compared with aminophyllin, the action is more prolonged; further it does not reduce the blood pressure in man as aminophyllin is believed to do. In cases of angina-pectoris, Khellin is able to reduce the frequency and severity of the attacks and also produces a greater sense of general well-being. It can be used in the treatment of angina-pectoris for the relief of individual acute attacks of pain, the dose being 50 mg. orally three times a day.

As it improves the collateral circulation and gives relief to anginal pain it is useful in coronary thrombosis. It was further observed that exercise-tolerance increased in all patients. There have been recent reports about its use in whooping cough.

The distressing and debilitating paroxysms which are due to plugs of mucus blocking the bronchioles, require bronchial and broncheolar dilators to relieve them. Khellin was found to lessen the obstruction and remove the inflammatory secretions more easily. The intensity and duration of the paroxysms were also greatly reduced.

SIDE-EFFECTS :—The drug has been found to produce a few side-effects on prolonged administration and also when large doses are given; these are nausea, constipation, heaviness, dizziness, somnolence, insomnia, urticaria and dermatitis.

I shall now give a short account of my experience on the use of Khellin in the following conditions :—

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| I. Hypertensive heart disease. | IV. Coronary thrombosis. |
| II. Angina-pectoris. | V. Renal stone. |
| III. Bronchial asthma. | VI. Cardiac asthma. |

I. Hypertension.—The general practitioner is often called upon to deal with cases of hypertension where certain persons exhibit a vasospastic tendency affecting the arteriolar system to varying but definitely abnormal degrees. The stress and strain of modern life largely accounts for the vaso-spasm that arises from environmental factors. Hypertension can greatly accelerate the natural physiologic process of arterio-sclerosis incidental to aging. Consequently coronary sclerosis becomes a necessary corollary to hypertensive heart-disease. In such conditions, the drug Khellin proves very beneficial to the patients who go to the family physician, feeling short of breath on exertion. This symptom usually connotes a gradual diminishing cardiac reserve, on which the effect of coronary insufficiency may have been superimposed. In such cases, I used Khellin in tablet form in doses of 50 mg. three to four times a day according to the severity of the condition. I have treated several such cases where the blood-pressure ranged from 180 m.m. Hg. to 230 m.m. Hg. systolic and 100 m.m. Hg. to 130 m.m. Hg. diastolic with gratifying results. In the early stages, the patients were asked to take three tablets (50 mg. each) three times a day for the first two weeks and then two tablets twice daily for a further period of two weeks and later one tablet once a day for two weeks. The results were extremely satisfactory and my patients were found to be keeping fit and comfortable to resume their daily work. Here I must mention that some of these patients were taking other medicines to reduce their hypertension such as *serpina* along with Khellin. A word of caution is necessary here. Khellin should *not* be administered late at night and the last dose for the day should be given not later than six in the evening; otherwise it has a tendency to cause insomnia in some susceptible individuals.

II. Angina pectoris.—The attacks are due to a relative myocardial anoxia which occurs when the demand upon the heart becomes temporarily greater than can be met by the available coronary blood flow. These attacks of pain bear a direct relation to exertion or emotion and are only relieved by rest or nitroglycerin tablet $\frac{1}{150}$ to $\frac{1}{100}$ gr. placed directly under the tongue. The action of nitro-glycerin is not however sufficiently prolonged, though the relief is immediate and prompt. In such cases I used Khellin by mouth though in the anginal attacks its action was more delayed than that of nitroglycerine and I found that by the continuous use of Khellin the frequency and severity of attacks were reduced to a minimum and the exercise-tolerance greatly increased in all my patients. These patients were asked to take Khellin in doses of 50 mg. three times a day for the first two weeks and two tablets twice a day for a further two weeks and finally one tablet per day for two more weeks.

The patients may continue it for a month more if he finds that he can keep well with it. I came across only a very few cases, who, at the beginning of the treatment, required nitro-glycerin tablets twice or thrice a day but ultimately there was no need at all for the same.

In this series, two patients had to discontinue the drug as one of them had a feeling of nausea and slight headache and the other patient had a feeling of dizziness. One of my patients took it continuously for three months without any ill-effects and he felt happy and thoroughly fit for his arduous work. Only a few cases required doses larger than 300 mg. per day. In spite of these good results, I always advise my patients to carry a tablet or two of nitroglycerin and their identification cards with them. I consider that Khellin is the drug of choice in angina pectoris. In cases of coronary thrombosis after the attack, gratifying results were obtained with Khellin. Adequate response was obtained when the drug was administered between attacks.

III. Bronchial asthma.—In one case, six tablets of Khellin 50 mg. each given during the acute stages of the attack failed to produce any effect and the patient had to resort to three injections of Adrenalin in twentyfour hours but after persisting with Khellin for two days continuously the patient did not get another attack of a severe type for the next four days and afterwards he did not get even a single attack till now. In another case, I first gave an injection of Adrenalin and then I put him on Khellin 50 mg. per dose three times a day; he took it for two weeks and reported that he was feeling quite well and fit to work. I have since prescribed it in several other similar cases. It is my belief that it works better when started between the attacks.

IV. Renal colic.—In renal colic, it acts miraculously; the patient is quickly relieved of the pain and passes urine freely. I prescribe it to four patients, in doses of 50 mg. three times a day for the first week and then two tablets twice a day for two further weeks; all the four cases were greatly benefited by Khellin.

V. Cardiac asthma.—In cardiac asthma, relief was obtained three days after administration of Khellin and the duration of attacks was lessening day by day. For the first week the patient was taking two tablets a day i.e., one in the morning and one in the evening (50 mg. for each dose). After taking twentyfour 50 mg. tablets he had no severe attacks; occasionally he used to have a mild spasm of cardiac asthma lasting for five minutes only and that too, only when there were marked variations and changes in the atmospheric conditions e.g. very chill weather etc. He is still continuing the treatment by taking one tablet per day and feels quite happy and fit for work.

Khellin in my hands has been an efficient therapeutic agent in the treatment of different conditions that need a reliable coronary

and broncheolar dilator; it merits further extended trials in these and other conditions also. The drug is however very expensive, almost prohibitive as regards cost, which is indeed a serious drawback and a limitation to its extended use.

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Treatment of Urgent Cases of Paroxysmal Auricular Fibrillation

Hellman, *et al* of the Cardiac Clinic, New York, describe a group of 25 cases of paroxysmal auricular fibrillation and propose a plan of treatment which has been successful in their hands.

A.—Begin treatment with the intravenous administration of a rapidly acting digitalis preparation. In view of the high incidence of toxic manifestations encountered with acetyl strophanthidin, it is recommended that Ouabin, k-strophanthin, lanatoside C or digoxin be used instead.

B.—If slowing of the ventricular rate occurs, digitalization may be quickly accomplished, as in several recently proposed methods for the combined use of intravenous and oral digitalis preparations.

C.—If however slowing of the ventricular rate does not follow within 20 to 60 minutes, depending upon the latent period of the preparation used, quinidine therapy should be initiated without delay. If congestive heart failure is present, continue digitalis in conjunction with the quinidine.—(*Am. Jour. Med. Sci.*, 221, 6, pp. 655-659, 1951).

Treatment of Hepatitis with Brewer's Yeast

Davis report the favourable results obtained by him on 126 patients with early acute or subacute hepatitis, as revealed by liver function tests repeatedly carried out throughout the whole course of treatment. In 19 severe cases the patients were confined to bed for about 6 weeks. The others were ambulatory and attended to their duties without any interference. All were given a rich diet of high caloric content consisting of 140 gm. of protein 350 to 400 gm. of carbohydrate and 70 gm. of fat, Vit. B complex consisting of a daily dosage of 30 mg. riboflavin and 25 mg. niacin. Neither choline nor methionine was included in the diet. All patients were given 12 gm. dehydrated Brewer's yeast daily. This was given during each meal dissolved in barley-water, milk or fruit juice. With this treatment, 29 patients were cured, 40 were improved, 52 were greatly relieved and only 4 obtained no relief. Davis considers that dehydrated Brewer's yeast containing a high percentage of vitamin B has definite therapeutic value.—(*Med. Jour. Aust.*, 2: 790, 1951).

OBSERVATIONS ON THE LOCAL USE OF PENICILLIN

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ENCOURAGED by the good results obtained by using Penicillin locally in a case of chronic ulcer of mycotic origin (ANTISEPTIC, Dec. 1948), I tried the same line of treatment in various other types of cases such as acute and chronic ulcers, abscesses and sinuses and got miraculous results; from these I can say that this form of treatment is very efficacious, time-saving and economical especially in the mofussil and in rural areas where patients cannot go to the doctor frequently. The organisms responsible for the lesions must of course be susceptible to Penicillin.

Form of Penicillin used.—1. In the case of ulcers and superficial excoriations:—a solution of one lac units of Penicillin in 10-20 c.c. of peni-stabilizing solvent (Chemo-Pharma) is prepared. The ulcer is first cleaned properly by removing the slough from the base, the margins cut if necessary and a sterile wet gauze is spread over the ulcer. A few drops of the Penicillin solution are poured over the gauze covering the ulcer by means of a sterile dropper; this sterile lint and cotton are put over it and the dressing is complete. The patient is asked to pour a few drops of the solution on the gauze at least twice a day for two or three days. By this time the ulcer will be found to have ceased discharging pus or serum leaving a fine granulation or to have completely dried up leaving a scar. The treatment can be repeated, if required, for a further period of two or three days.

2. In cases of abscesses of sinuses:—The abscess is evacuated either by incision or aspiration and then 1 lac of Penicillin in 2-3 c.c. distilled water is instilled into the abscess-cavity by the aspirating needle or by a hollow probe in the case of a sinus. The treatment should be repeated every day for 2 or 3 days by which time the lesion will have healed up except in cases where the necrotic material has not been completely removed or discharged e.g. sequestrum, suppurating gland, etc.

Illustrative cases.—Case 1:—A lady, aged 45 years, came with a large chronic ulcer on the dorsal aspect of her right forearm. It started as a papule which was scratched. The ulcer was present for the last one year discharging foul-pus, the base was covered with sprouty granulations and was free from the underlying bone. It was very painful. The smell was very foul. After unsuccessful treatment by two or three doctors who tried their best to give relief she was advised to go to the civil hospital; here she was advised amputation of the forearm, without even being X-rayed to find out if there was any lesion in the underlying bone. The lady was not prepared for the amputation. When I saw her I excluded malignancy and thought of trying the above line of treatment. The ulcer was dressed with

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Penicillin solution after cleaning it and the lady was asked to put a few drops of the solution at least twice a day for 3 days. At the end of 3 days when I saw her again I found that the whole of the ulcer had completely dried up, except at one corner where there was a little discharge. The pain had disappeared on the very first day and the foul smell had also disappeared. The treatment was repeated and the ulcer got completely healed within 8 days leaving only a scar. She naturally blessed me for saving her hand from being amputated.

CASE 2:—A girl aged 10 years, got a stone injury on one of her toes. The wound got septic and the inflammation spread to the middle of the foot upwards and down the web of the toes. The swelling burst in course of time and did not show signs of healing for 15 days. The patient suffered from terrible pain for days and nights. When she came to me I applied the above line of treatment after cleaning the lesion. The pain subsided completely on the very day of dressing and she had good sleep. Within 8 days, she was completely cured.

CASE 3:—A girl aged 3 years, had a swelling of the size of a big orange in the right pectoral region for 8 days. Evidently it was an acute abscess. The abscess was opened and dressed with a gauze dipped in Penicillin solution. After two days the discharge was considerably reduced in amount. This time I injected 1 lac of penicillin in 2 c.c. distilled water through the incision wound into the abscess cavity and put a dry dressing over it. At the end of 3 days when the dressing was removed there was not a drop of pus and the incision wound had also healed up.

CASE 4:—A boy aged 2 years, was brought to me with a sinus on the lateral aspect of the lower part of the left thigh discharging thin pus for the past 1½ months. The history was that the thigh had swollen about 1½ months ago and one day the swelling burst at the lower end of the thigh discharging a lot of pus. On passing a probe through the opening the whole of the probe (about 6") went into the sinus and was felt in the thigh. I took out the probe and through an eustachian catheter injected 1 lac of Penicillin in 2 c.c. distilled water into the sinus. Three days later, the opening of the sinus had completely healed up.

Besides the above types of cases I tried it in cases of chronic otorrhœa. A few of the cases responded with good results while in others the discharge decreased in quantity but the lesions did not completely heal up.

The great advantage of this treatment lies in the prompt relief of pain and a shortening of the period of treatment. It is obviously therefore, more economical too. Will my brother doctors give this a trial?

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REVIEWS OF BOOKS, PERIODICALS AND REPORTS

Proceedings of the Fourth Session of the Indian Pharmaceutical Congress held at Jaipur in Dec. 1951.

We have received from the General Secretary of the Indian Pharmaceutical Congress Association, Calcutta the Proceedings of the Fourth Session of the Congress and a copy of the Presidential address delivered by Shri S. P. Sen, M.Sc. He traced the origin of the healing art in ancient India and its gradual and slow development through the centuries. After dealing at length with the status and functions of pharmacy and of pharmacognosy as applied to modern medicine he deplored the absence of a bureau of plant industry and a National Herbarium in India and pleaded for the immediate establishment of one. He also referred to the advances made in therapeutics and to the modern trends in the country towards self-sufficiency in the manufacture of chemotherapeutic and antibiotic agents. The proceedings of the Jaipur session which was largely attended have been recorded and abstracts of the various papers read and discussions made, have also been included in the proceedings sent to us. These relate to a wide variety of subjects and prominent doctors and pharmacists have participated in them.

The presidential address of Vaidya Jadavji Trikamji Acharya, at the Ayurvedic Session of this Congress dealt at some length with the five main and other subsidiary kalpas and pleaded for a standardization and a uniformity of procedures for the whole of India.

Annual Report of the Pasteur Institute of S. I.

We have received the annual report of the Director of the Pasteur Institute of Southern India, Coonoor for 1950-'51. In it are included the 44th Annual Report of the Central Committee of the Pasteur Institute Association and the Scientific Report of the Research work carried out at the Institute during 1951 by the Staff of the Pasteur Institute.

The Director's report details the activities of the Institute during the year and pleads for larger grants from the Union and States' Governments and public bodies to enable the Institute to expand its activities. A considerable volume of research work was also carried out during the year, by the members of the staff, on various important subjects *e.g.*, Rabies, Syphilis, Leprosy, Enteric fever, Influenza, etc.

The reports under review are records of good and useful work carried out at the Institute.

WHO'S World Pharmacopœia.

1. The publication by WHO, on October 30th, 1951 of the Pharmacopœia internationalis* was an occasion of historic significance, resulting from efforts begun more than fourteen years ago under the auspices of the League of Nations. The formidable task of compiling this work, containing internationally approved standards and nomenclature for some 200 important drugs, was the responsibility of the WHO Expert Committee on Unification of Pharmacopœias under the chairmanship of Dr. C. H. Hampshire, of London.

2. The Publication by WHO of an International Pharmacopœia is a definite contribution to the attainment by all peoples of the highest possible level of health.

A book of standards to control the purity and activity of drugs is essential.

3. The various national pharmacopœias have been produced independently in accordance with the special needs of medical practice in each country, and may show significant differences in the physical and chemical characters of the medicinal substances actually used in treatment. The quality and the content of active principles of drugs of vegetable or animal origin may thus vary from one country to another. These

* First Edition, Volume I, xviii + 406 pp; price: 35/- \$5.00 Sw. fr. 20.—Available also in French and Spanish Editions.

differences are a danger when a patient, moving from one country to another, cannot be assured of obtaining the remedy prescribed for him of the strength and properties which he needs. For instance, people who require insulin in order to keep them in good health may have to travel, and it is essential that the drug which they use daily should always be obtainable in the same strength in whatever country they may happen to find themselves. Similarly with drugs for the control of heart diseases, and other instances could be quoted. If a drug of the correct strength is not available, time is lost in making it specially, or procuring it from a distance. Uniformity of drugs is also of great importance in trade between countries, and also in medical research. It may happen that the different national pharmacopœias give different names to the same drug, and it is clear that the same name should be used in all countries for describing a drug of the same strength and composition.

The need for world uniformity is evident. The International Pharmacopœia now published is the result of work begun under the auspices of the League of Nations Health Organization in 1937. It deals with about 200 drugs, each of which is fully defined by chemical, physical or biological tests. 43 appendices contain the instructions for carrying out the various procedures necessary to

establish the purity and strength of the drugs.

The medicaments described include not only the potent and efficient drugs which are established in national pharmacopœias, but also many newer drugs which appear likely to attain a permanent place in therapeutic practice. Thus we find century-old drugs like opium, belladonna, ergot and ipecacuanha and their alkaloids, and phenol and mercury compounds, side by side with modern synthetic drugs such as aspirin, phenobarbitone, the sulphonamides and proguanil, and with biological products such as pituitary injection, adrenalin, the vitamins and the sex hormones.

An important function of the book is to fix international names for the drugs included. The titles to the monographs are in Latin and their adoption throughout the world will prevent the confusion which may arise from the use in different countries of different names for the same drug.

A Table of Doses is included. This gives the recommended usual and maximal doses of all the drugs described in the book; figures for single and daily doses are stated according to the mode of administration. An introductory statement indicates the procedure to be adopted when a physician desires to prescribe a larger dose than the stated maximum.—*W.H.O. News Letter*, Nos. 11 and 12, 1951.

NEWS AND NOTES

New Enteric Laboratory for U.P.

An enteric reference laboratory—the first of its kind in India, will shortly come into being at Lucknow. The laboratory, which is sponsored by the Uttar Pradesh State Ministry of Health will devote itself to the cause of countering typhoid which takes a very heavy toll year after year throughout the country. Located in the premises of the Lucknow Medical College, the Laboratory will work under the direction and guidance of Dr. N. P. Gupta, who was deputed to foreign countries by the State Ministry, to undergo special training in typhoid research.

Lecture on Rehabilitation of Bayer Factory in Germany

An interesting lecture was given to members of the medical profession by Dr. A. G. Brocke, Dr. Phil. Nat. (Jena), Scientific Adviser to Messrs. Chowgule & Co. (Hind) Ltd., at the Institute of Foreign Languages, Bombay on Wednesday, February 20th 1952. "Bayer in Leverkusen was one of the few factories in Germany which hardly suffered any damage during the bombing raids in the war in spite of the fact that Cologne, only six miles away, was literally razed to the ground. Although production was encouraged after the war by

the occupation authorities to cover the demand for essential drugs, disinfectants, insecticides, the factory organization had to face enormous problems. Road and rail traffic was entirely dislocated. Supplies of coal and fuel were lacking through the devastation of the Ruhr industrial territory, which was the main supplier of these utilities. Foreign sources of raw material were cut off and the delicate structure of the German chemical industry with its interchange of basic and intermediate chemicals was jeopardized. The report published by these factories describes how the administrative and scientific staff as well as workmen were mobilized for the task of rebuilding. Laboratory chemists were seen climbing the roofs together with the workers to get them once again water-proof. As there was lack of building material, one of the chemists with the help of newly trained workers produced 70 to 80,000 tiles and bricks per month. The shortage of packing material was made good by collecting waste and remanufacturing into finished products. To overcome the lack of fuel, the Bayer factories built their own gas-generating plant. Raw material such as pyrites formerly imported from abroad came, for the time being, from deposits about 100 miles away. A number of workers were living far away and could not reach the factory owing to dislocation of traffic. A little plant was erected for the manufacturing cycle tyres to meet the shortage of tyres and enable the staff to come to work by bicycle. Barracks were springing up and public kitchens were installed."

"Having thus coped with the daily necessities, attention was given to long term replacement of the lost sources of supply and emergency plants were built to produce glass containers of every size, bottles, tubes, etc. With the help of the Marshall Plan, raw material could be imported again. According to the statistical report at the beginning of 1950, the manufacturing capacity of the Bayer factories in Leverkusen was exceeding its pre-war level. Research in many fields is going on on the old scale. One hardly remembers that a number of drugs which are now familiar to all

of us, were originally invented in these laboratories. Phenacetin, Aspirin and the barbiturates like Veronal, Luminal are some of them. The first sulphadiazine, Prontosil came from Leverkusen. Bayer's name is particularly coupled with research in tropical diseases. The synthetic malaria remedies, Atebrin and Plasmoquine and recently Resochin (Chloroquine) were invented by them. The name of Domagk, who introduced sulphonamide therapy, is again in the light as the inventor of Conteben, a new drug for treatment of tuberculosis and leprosy."

Dr. A. G. Brocke concluded that the success of Bayer, Leverkusen, in the past would not have been possible without the wholehearted co-operation given by the medical profession abroad. Research workers in India have played a leading part in ascertaining the clinical value of preparations for tropical diseases. More recently still, the Malaria Institute of India has published valuable data relating to the suppressive action of various synthetic antimalarials. This valuable co-operation between industrial and research workers has resulted in an appreciable raising of the public health and of the living standards in tropical lands.

Better Statistical Services Vital for Regional Health Programmes

Recommendations for the development and up-grading of health statistics services vital for rational planning of public health programmes in S. E. Asian countries are being formulated by Dr. W. Thurber Fales of the Johns Hopkins School of Hygiene and Public Health (U. S. A.), WHO consultant in Health Statistics who has just concluded a five-months visit to Burma, Ceylon, India, Indonesia and Thailand on the invitation of Governments. He says:—

Improvement in Health statistical services must be based on a fuller realisation of their purpose and function in the day-to-day operation of health departments. In most of the countries visited, too much emphasis was placed upon the routine compilation of figures of births and deaths, and too little upon obtaining data necessary to define measure and evaluate the major health

problems which the different national and local health services were setting themselves to solve. In no country did Dr. Fales find any true knowledge of even the approximate incidence of serious diseases other than cholera, plague and small-pox. Among the economically important health problems for which information on prevalence and distribution was urgently needed are tuberculosis, trachoma, syphilis and hookworm.

The Kasturba Hospital, Sevagram, (Dt. Wardha).

Dr. Sushila Nayar, Secretary of the Kasturba Hospital, Sevagram, has sent us a letter detailing the activities of this charitable and humanitarian institution, which was started in Mahatmaji's Ashram in 1937 and which has since extended its sphere of usefulness to cover a ten mile radius and include 75 villages. The average daily attendance is now 100 to 150 patients. Both the curative and the preventive aspects of medicine and public health, Maternal and Child Health Services including antenatal care, and special clinics for children, are dealt with by this centre. This useful Hospital has no regular source of income, and was being financed by Mahatma Gandhiji through donations from friends during his lifetime. The population served by this hospital is very poor and cannot be expected to contribute very much towards the expenditure which has risen very much in recent years.

Dr. Sushila Nayar who is continuing this admirable philanthropic work, initiated by the father of the nation, appeals for cooperation and help from all well-wishers. We strongly commend this appeal to our readers for such assistance as they can give from time to time.—[Ed. "Antiseptic"]

Studies on Plague Epidemics in Bombay Province

Systematic studies on the course of plague outbreaks in Bombay Province make it possible to a certain extent to forecast when new epidemics are to be expected in centres where they are fre-

quent, according to an article in a recent number of the bulletin of "The World Health Organisation". The Author of the article is Dr. M. Sharif, formerly Assistant Director in charge of the Department of Entomology, Haffkine Institute (Bombay).

Dr. Sharif's analysis of plague epidemics from 1930 to 1945 in two divisions of Bombay Province shows that there are two main centres of infection, one in the Western Ghats and one in the hills of Hyderabad State. The district of Sholapur always imports plague from Hyderabad State; all the other districts from the endemic centre situated in the Western ghats—Bijapur and Ahmednagar districts, however, receive infection from both these endemic centres. The districts of North Kanara, Ratnagiri, and Kolaba suffer little from plague on account of their location on the eastern sudden slopes and top of the Western Ghats.

In Bombay Province, according to Dr. Sharif, wild rodents do not play any part in the spread of plague; only domestic rats are involved. The onset of the rainy season not only increases the rat population indoors but also leads to an increase of the rat flea population owing to lowered temperature and higher humidity and permits the fleas to leave the rat burrows and to attack human beings.

In Dr. Sharif's view, plague is as much an urban as a rural problem. Even if the disease does not break out severely in commercial towns, they still, play an important role in dispersing the infection to villages where it flares up owing to the higher susceptibility of their rat populations.

International Assistance for Nation-wide Expansion of BCG Vaccination

Thirty eight new vehicles costing \$ 70,000 (about Rs. 340,000) have recently arrived in India for use in internationally-assisted BCG Vaccination Campaigns. 62 more such vehicles are due to come from the United Nations Children's Fund (UNICEF). A number of these vehicles will be shortly handed over for use in Madhya Bharat, Punjab (I) and U.P. which are the first three states in India to launch mass BCG

vaccination campaigns under an overall scheme to cover the total population of children and young adults within the next three years. International assistance includes necessary supplies, medical equipment and transport from UNICEF and sufficient WHO personnel to train local teams in BCG vaccination techniques.

Later in 1952 it is planned to switch WHO-UNICEF assistance to mass campaigns planned in PEPSU, Travancore-Cochin and West Bengal and probably also in Delhi, Bombay, Bihar and Hyderabad. In 1953 and later, Jammu and Kashmir, Madhya Pradesh, Madras, Mysore, Orissa, Saurashtra, Vindhya Pradesh and Rajasthan will in turn introduce BCG vaccination on a mass scale.

Tuberculosis experts both in India and abroad, are said to be agreed that the energetic expansion of mass BCG vaccination campaigns during the next few years is an essential first step in the attempt to control tuberculosis by cutting down new cases to a point where it will become increasingly practicable to employ the more expensive control methods aimed at neutralising the sources of infection by isolation and treatment.

Watumull Foundation Essay Competition on Population Control in Relation to food in India.

In the above Essay Competition held recently, over 1000 contestants participated. The essays were first judged by a panel of 15 judges in India; the best 25 were sent to the U.S. for final judging by a special committee of experts. The prize-winners are:—

- (1) A. R. Mehta, Retired Deputy Director-General of Health Services, Govt. of India—Rs. 3,000.
- (2) S. Ranganathan, Chief Chemist, Nutrition Research Laboratories, Coonoor—Rs. 1,000.
- (3) Mrs. Kamalini Kulkarni, Poona—Rs. 500.
- (4) B. B. Ghosh, Calcutta—Rs. 200.

Six prizes of Rs. 100 each go to Pravarakar Sen, Nikhil Ranjan Banerjee, Moreswar Patwardhan, Padmanabhan Nair, Anikendra Mahalanobish and Arun Krishna Banerjee.

The first three essays are to be published by the Foundation in pamphlet form for distribution throughout the world.

The Eighth Bengal Pharmaceutical Conference, Calcutta.

The Eighth Bengal Pharmaceutical Conference will be held in Calcutta during the month of June, 1952. The scientific session will include two symposia: "Ayurvedic Pharmacy" and "Pharmacist in the Control of Spurious Drugs". Distinguished persons have been invited to take part in them.

The Secretaries invite communications from Scientific workers on any of the above subjects. Those who like to contribute papers are requested to intimate the titles of their papers as early as possible. The last date for receiving manuscripts is the 31st March, 1952. Papers accepted for the conference will be published in the "Indian Pharmacist",—the official organ of this Association.

Suggestions from the members of the Association for the betterment of the Conference will be thankfully welcomed. Those who are willing to move any resolution may kindly send the same before the 15th, April 1952. All communications may be addressed to the general secretary of the Eighth Bengal Pharmaceutical Conference, 7, Lower Rawdon Street, Calcutta, 20.

International Congress of Doctors (Indian Section)

A representative meeting of leading doctors was held in Bombay recently to support the proposal to hold an International Congress of Doctors in Italy this year and elected a Committee to start work for the Congress. Dr. R. N. Cooper is the President and Dr. U. B. Narayana Rao is the General Secretary. The International Congress of Doctors has for its object, amongst other important items of interest to the medical profession, the study of the harmful effects of war preparations on the health of the people and the development of the medical science and the maintenance of peace. The World Council of Peace of which the celebrated scientist, Professor Joliot-Curie is the President has

decided to give the fullest support to the organisation of this International World Conference, which is scheduled to meet in Italy this year. The organisers of the Indian Section, rightly visualise that the Committee formed by them will become the nucleus for a more influential All India Committee, to which the medical profession in every one of the 26 States in the Indian Union will nominate representatives. It is requested that local committees be formed in every State and organize symposia on subjects of interest; this will help in preparing papers for submission to the Congress.

This movement organized by a Com-

mittee of Doctors in Bombay with a view to supporting the laudable objects of the International Congress of Doctors, certainly deserves full measure of support from all the members of the medical profession in every State in India and we heartily welcome this move. It is hoped that local and provincial committees will be formed early in all the States and representatives nominated to the proposed All India Committee. We are informed that Shri Dr. T. S. Tirumurti, the President of the Indian Medical Association has agreed to serve on the All-India Committee which is indeed a happy augury.

CORRESPONDENCE

To the Editors. THE ANTISEPTIC, Madras.
Sirs,

A Short Note on DDS in Leprosy

Diamino-diphenyl-sulphone (A v l o-sulphon or cryosulphon) in one half or one tablet dose (each tablet is 100 mg.) per day after food, continued over some months, helps to absorb filarial tissues in the limbs. Though this is an inde-

pendent observation of mine on patients with Hansen's disease in this sanatorium it has been observed earlier in Purulia, in Behar and reported by Dr. Muir in "Leprosy in India."

Dr. I. VEDAMUTHU, L.M.P.,
Chevayur Leprosy Sanatorium,
Chevayur P.O.

ACKNOWLEDGEMENTS

We have received from the Medical and Pharmaceutical Information Bureau of New York, U.S.A. a "Magazine Story with pictures", dealing with the application of antibiotics to the disease and nutrition problems of India. The purpose of this and similar reports issued by them from time to time is stated to be the dissemination of public (sic) knowledge of new therapies, medicines and related scientific achievements.

We have received a neatly got-up and exhaustive symposium on Cortisone

from Merck (N. Amer.) Inc. of New York. In this symposium is "summarised the presently accepted and collected knowledge of cortisone."

We are in receipt of a short note from Messrs. Volkart Bros. of Bombay, on a new antituberculous, Rimifon (Roche) which is stated to have been developed by joint researches at the Hoffman-La-Roche Laboratories. The manufacturers state that they are willing within reasonable limits to supply trial quantities to those interested.

CORRIGENDA

In our review of the antibiotic number of the Indian Medical Forum published at page 179 of the 'ANTISEPTIC' for February 1952, please read R. G. Kar Medical College Calcutta instead of 'Lake Medical College'. The error is regretted.—(ED.)

Please read 'Uniferron' instead of "Uniferrum" in line 10, page 183 of this (March 1952) issue.

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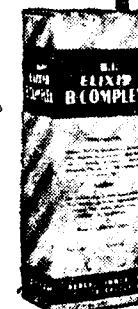
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Sodium Glycerophosphate	gr. 4
Potassium Glycerophosphate	gr. 4
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Procaine Penicillin Aqueous 4 lac. l.c.c. :—
Merck 2-10; Pfizer's Vial 2-12
Pamaquin 0-1 gm. 500 0-14 Seridon 250 tabs. 29-0
M&B N.A.B. 15 0-10 30 0-11 45 0-13 60 each 0-15
Praequine 500 tabs. 0-14 Thalazole 25 tab. 3-0
Soluseptasine 20% Soc. 25 amps. box 19-8
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Cork Screw with Tin Cutter each 1-0
Tongue Spatula Straight 1-8; Folding each 2-0
Maclean's Stomach Powder Med. Doz. 19-8
Bandages 2 x 1 1/2 yds U.S.A. doz. 2-0
Bayer's (German):—
Atebrin 15 0-12; 300 0-0; 1000 tabs. bot. 18-8
0-3gm. 2 amps. 2-0; 0-3gm. 25 amps box 20-0
Angier's Emulsion small bot. 1-13
Boot's Plurivite 100 caps. 7-0; Burnol Each 1-2
B.W. Atrophia Sulph 1/100 gr. 20 tabs tube 0-8
Digitalin 1/100 gr. 20 tabs. 0-8
Emetin Hydro 1/2 gr. 12 tabs. Tube 6-8
1 gr. 6 x 1 cc. box 9-12
Ciba's Gibazol 250 tabs. bot. 15-8
Coramine Liq. 15 c.c. 3-14; 20 tabs tube 3-2
1.7c.c. 5 amps. 2-12 20 amps 10-0
Enterovioform 20 2-12; 100 tabs bot. 11-12
Clinical Thermometers 1/2 min:—
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Down Bros. Record Needle doz. 4-14
Elastoplast 2 1/2 x 5 yds. 2-8; 3x5 yds. tin 2-12
Endo's Emetin Hydro 1/2 gr. 6x1 cc. box 2-4
Eng. Acridavine 500 2-8; 1000 tabs. bot. 4-0
Aspirin 5x100 1-0; 1000 5-12
Caffein 100 2-0; 1000 15-0
Adhesive plaster 1x5 yds. 0-10 1x5 yds. 1-0
Hydrageri Iodine Rubrum 12x1cc 0-6
Mercury Biniodide 12 x 1 cc. 0-14
Emetin Hydro 1/2 gr. 12 or 1 gr. 8 tabs. Tube 4-4
Tooth Brush Addis each 0-14
Face Powder 0-4; Shampoo Pow. pkt. 0-4
or U.S.A. Shaving Cream tube 0-10
Vitamin B₁ 5 mg. 25 tabs. bot 1-8
Yeast 1000 8-8; Sodamint 1000 tabs. 2-8
Hydrogen Peroxide 4 oz. 0-12
Entodan 10x2 cc. 8-4; Campolon 5x2 cc. box 6-0
Euquinine Holl. or Java 4-4; Roche oz. 4-10
Eye Dropper USA type 0-5 Finger Stall doz. 1-0
F.L. Paragon washable 0-8; Crocodile each 0-14
Durex Eng. 1-12; Silvertex USA doz. 2-4
Glaxo's Berin 1 mg. 25 tabs. 0-9; 100 tabs. 1-2
1 mg. 500 5-8; 1000 10-12
Hypo. Syringe All Glass Nacket:—
C.N.:— 2c.c. 50c.c. 100c.c. 200c.c. 300c.c. 500c.c.
German 1-0 1-6 2-0 3-0 6-4 8-0 B
Italy 1-10 2-8 3-4 5-0 8-0 10-8
Japan 0-11 1-2 1-10 2-12 5-0 6-0
S.N.:—Re. 1-0 More
Hypo Record Needle Japan or German doz. 2-8
Hypo All Glass Needle Japan 3-8; German doz. 4-0
Kapalin 10 mg. 25 2-2; Pamaquin 300 tabs. 0-12

Lactopeptin Elixir sm. 28-8; 1g. doz. 50-0
Lavandar Smelling Salt Eng. 13-8
Leukoplast Elastic 3x5 yds. 2-4; 2 1/2 x 5 tin 2-0
Lilly's Gentian Violet Jelly 4oz. tube. 0-6
Lilly's Sulphanilamide Cream 4 oz. 0-6
Litmus Paper Book Assr. doz. 1-0
Measure Glass 1 dr. 0-8; 2 dr. 0-9 1 oz. each 0-10
2 oz. 0-11 4 oz. 0-4 8 oz. 1-4
Mennen Talcum Powder Tin 0-12
Menthol Crystal 1 oz. 5-0; Gynomin tabs 1-14
Neo Salvarsan 15 1-12; 30 2-6; 45 each 2-11
Paludrin 1gm. 1000 tab. 28-0; 500 tab. 3gm. 26-0
Parke Davis Adhesive Plaster 1 x 5 yds ea. 1-0
P.D. Chloromycetin 12 Caps. bot. 25-12
Liver Ext. 2 USP 10cc. 4-4; 5 USP 10cc. ea. 8-0
Dinaltin Sodium 100 caps. bot. 6-0
Penicillin Sodium Cryst. G.:—
Merck's 1 lac. 2 lac. 5 lac 10 lac
0-11-0 0-12-0 1-5-0 2-10 vial.
Pfizer's 0-13 0-15-0 1-7-0 2-12
Quisacria USA 100 1-2; 1000 tab. USA bot. 11-0
Quinine Sulph. Govt. B.P. 47-12; Std. lb. 41-0
Holl. 48-0; Java 50-0; How 52-0
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Bihydro 2gr. 100 3-12; 5gr. 100 bot. 8-4
Italy 15gr. 2c.c. 5amps. box 0-14
Bisulph 2gr. 100 3-0; 5gr. 100 tab. 5-0
B.W. 10gr. 12x2 c.c. 4-0; Evans 3-12
5gr. 1cc. 6amps. B.D.H. 1-14
5gr. 1cc. 100 B.D.H. Est. 18-8
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Stethoscope POUCH PLASTIC Superior Each 2-0
Stethoscope Pouch Plastic with Clip ea. 3-0
Stethoscope POUCH PLASTIC with double chain 6-8
Sulphadiazine 500 48 0; 1000 tabs. bot. 81-0
Sulphaguanidine 500 17-0; 1000 Tabs bot. 33-8
Sulphanilamide U.S.A. 5gr. 1000 tab. 7-4
Eng. 7 1/2 gr. 1000 10-8; 500 Tin 5-10
Sulphathiazole Boots 500 tabs. tin 23-8
Suture Needles 0-4; Saline Needle each 1-14
Spirit Lamp Glass 2 oz. 1-4; 4 oz. each 2-0
Metal 2 oz. 2-8; 4 oz. each 3-8
Silk Worm Gut 1-8; Horse Hair 100 Strand 1-12
Stethoscope German B.D. Type 11-8
Rubber Tubing yd. 0-12
Plastic Tubing 2-0
U.S.A. Tooth Powder 0-6; Paste each 0-14
Watch Straps 0-12
Vick's Vapard 21-0; Inhaler doz. 20-0
Wampole Phosphocellithin bot. 10-4
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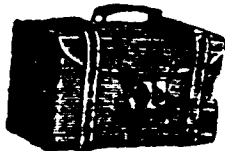
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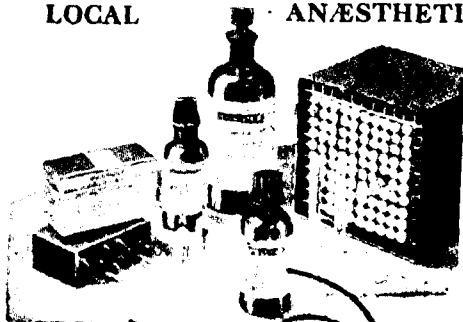
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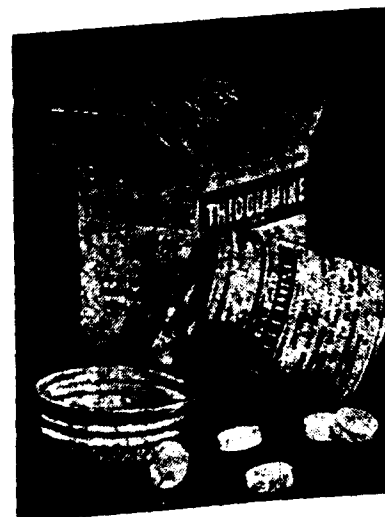
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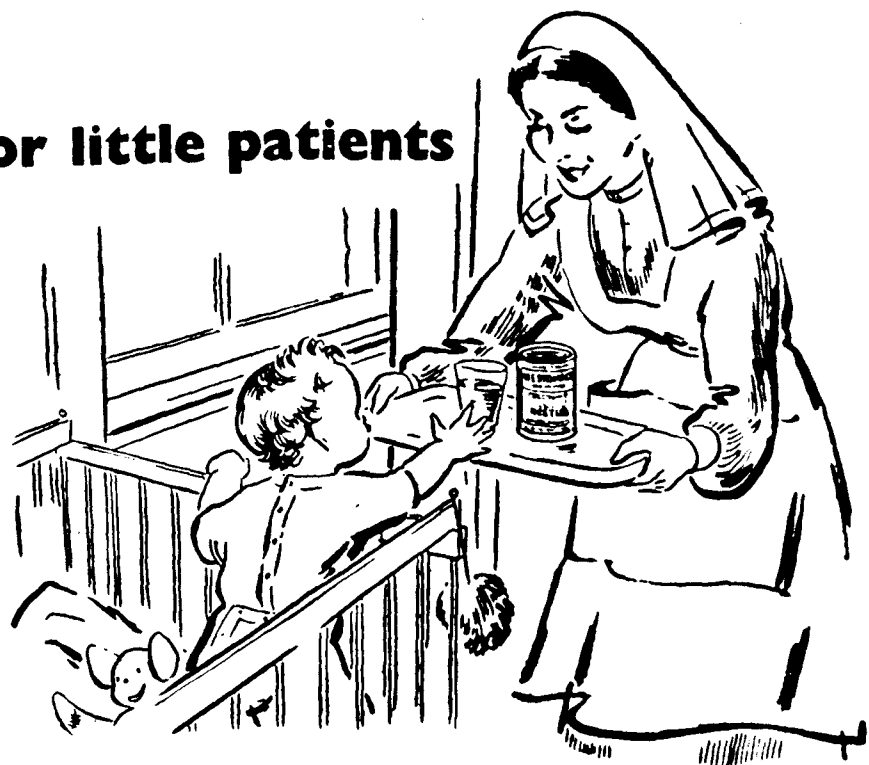
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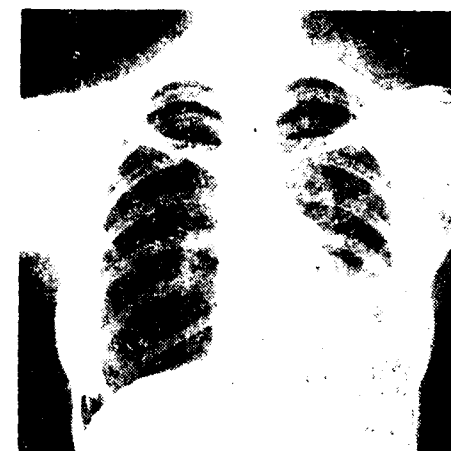
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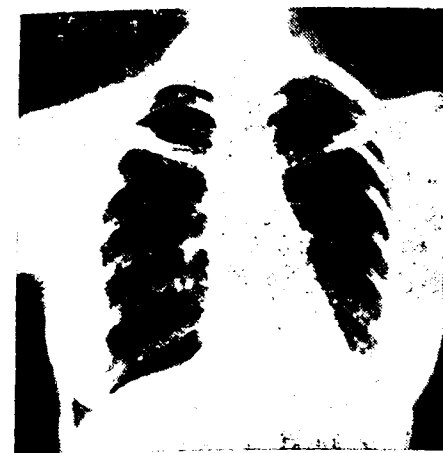
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↑ BEFORE TREATMENT

(9 days prior to Dihydrostreptomycin therapy)
Diffuse lobular tuberculous pneumonia, lower half of left lung; thin-walled cavity above hilus (3 x 3.5 cm.).



← AFTER 3 MONTHS' TREATMENT

(2 days after discontinuance of Dihydrostreptomycin) Considerable clearing of acute exudative process in the diseased lung; cavity smaller and wall thinner.

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in vials of 2 cc. (1 gm. Dihydrostreptomycin base) and 10 cc. (5 gm. Dihydrostreptomycin base)

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Each fl. oz. (28 c.c.) contains:

Vitamin B ₁	2.5 mg.
Niacinamide	15 mg.
Calcium Hypophosphite	1 gr.
Sodium Glycerophosphate	1 gr.
Iron Ammonium Citrate	60 gr.
Vitamin C	25 mg.
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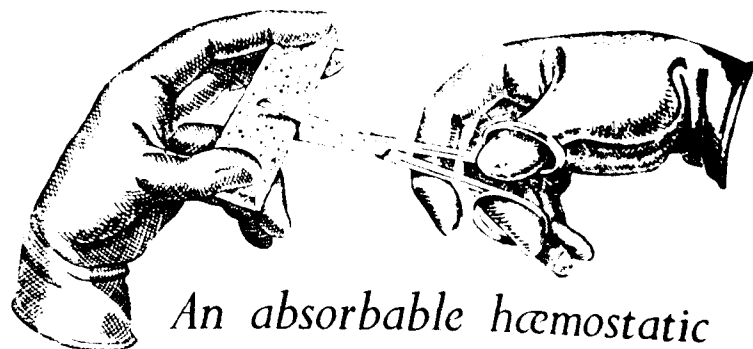
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Pfizer 1-1	1-8	2-14	Veramon 20 2-12;	100	11-4
Aqua 3 lacs 1-8;	4 lacs 1-11		Yeast 100 2-12;	1000	9-12
" Eye Oint 8-4;	Skin Oint 12-0 doz.		Cotton Wool 2-4;	Lint	4-2
" Lozenges 13-8 doz.	Tab. 1 lac. 12 4-12		Bandages 1" 1-2; 2" 2-4; 3" 3-6 doz.		
Streptomycin Merck 3-0;	Pfizer 3-1; Glaxo 2-10		Hypodermic Syringes, naked each in box		
Chloromycetin 25-8;	Aureomycin 19-0		2 5 10 20 30 50 cc.		
Terramycin	250 mg. 8 18-0		All glass Jap. ord. 0-13 1-6 1-14 3-0 5-8 7-8		
Quinine Bihyd.	10 gr. 2 cc. 100 amp.		" " " Sup. 1-0 1-12 2-4 3-8 6-0 8-0		
P.D. B.W. BDH or Evans Ind.			" " " Ideal USA 5-10 7-8 9-12 11-0 16-8 23-6		
47-0 32-8 25-14 17-8			L. Lock Ideal " 7-0 9-0 12-0 15-0 22-0 32-0		
5 gr. 1 cc. 100 amp. Ind. 12-8; Eng. 24-0			" " " B.D. " 7-8 11-8 14-8 16-12 24-0 33-8		
N.A.B. 30 0-11; 45 0-13; 60 1-0			" " " Jap. Ord. 2-6 3-6 4-8 7-0 10-0 15-0		
Neo Salvarsan 30 2-4; 45 2-8; 60 2-15			" " " Sup. 2-12 4-0 5-8 8-0 11-0 16-0		
Redoxon 6 x 2 cc. 5-0; 3 x 5 cc. 4-8			Record Boston USA 5-4 6-4 7-12 11-8 16-0 22-0		
Calcium Sandoz 100 amp. 5 cc. 95-0 10 cc. 100-0			" Ger. Sup 5-0 7-0 9-0 12-0 7-8 23-12		
" Gluco 10%, 100 amp. 10cc. 13-8; 5 cc. 12-0			for Side Nozzle Re. 1-0 more.		
Distilled Water 100 amp. 5 cc. 6-0; 10 cc. 8-0			Hypodermic Needles Stainless steel dozen in a box.		
Glucose Sol. 25% 25 cc. 100 amp. 20-0			Record Mount Eng. 3-12; Down Bros 4-8 doz.		
Normal saline 100 amp. 5 cc. 7-4; 10 cc. 8-4			All glass " Japan 3-0 doz. USA Sup. 7-12 "		
Emetine Hyd. USA 1 gr. 12 4-4; 100 35-0			Only Inj. Record 6-0 doz. Luer Mount USA. 9-0		
Ephedrine Hyd. 1 gr. 100 Amp. 9-12			Saline Needles 2-0; Lumbar Puncture 6-0 each		
Vit. B ₁ 100 mg. 1 cc. 100 35-0; 10 4-8			Rubber Gloves Sup. 2-8 pair. Catheter Ind. 8-0 Eng 1-8		
" " 50 mg. 1 cc. 100 24-0; 10 3-0			Erkameter 67-0; Baumanometer 125-0		
" " 10 cc. 100 mg. 4-0; 50 mg. 3-0			Diagnostic set Gowll and 3004 108-0 3007 195-0		
Berlin 10 cc. 25 mg. 2-8; 50 mg. 4-0; 100 mg. 6-4			Pneumothorax app. Lillingston & Pearson		
Vit. B Complex 2 cc. 100 37-8; 10 4-12			model Comp. 115-0		
Vit. C 100 mg. 2 cc. 100 20-0; 10 5-12			Stethoscope BD. 20-4; B.D. Type Ind. Sup. 14-0		
" " 500 mg. 5 cc. 100 40-0; 10 5-12			Personal Weighing Machine USA 42-0		
Vit. B ₁₂ 1 cc. x 6 amp. 20M 4-6; 50M 6-12			Salter 85; Seca 75; Alexandra 68-0		
" " 50 Micron 5 cc. Vibex 5 cc. 3-4			Ophthalmoscope Gowlland complete 58-0		
Combex 10 cc. 6-12; 5 x 3 cc. 7-0			Eye Tonometer Dr. Schiotz German 39-0		
Compolan 6 x 2 cc. 5-14; with vit B & C 4-6			Potains Aspirator set B.D. complete 135-0		
Liver Extract 10 cc. 3-2; 10 cc. PD 2 USP 3-14; 5 USP 7-14			Saccharometer Ind. 6-0; Eng. 10-0		
" " 10 cc. PD 2 USP 3-14; 5 USP 7-14			Saline App. 300cc. 9-0; 500 cc. 12-0; Rogers 19-8		
Acetylarsan 10 amp. 3 cc. 5-8; 2 cc. 4-8			Kahn Test Outfit Comp. 45-0		
Promin P.D. 5 cc. 2-0; Atophanyl 19-0			Widal Test outfit Comp. 10-8		
Atebrin Amp. 3 G 25 Amp. 3-6			Thermometers Zeal 30-0; Eng. or USA 19-0 doz.		
Calcioostelin 15 cc. 30 cc. 100 mg. 4-4			" Japan ord. 10-8; doz. Superior 12-0 "		
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Aspirin Tab. 300 9-4			with 8 Instruments 150-0		
Atebrin Bayer 15 0-13; 3000 52-8			Filters, English with candles.		
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" Sulphatriad 100 9-0; Quinaerin 1000 11-0			" Tab. Italy 100 3-12; 500 18-4		
Mepacrine 1000 10-12; 500 1-8			Paludrin Tab. 500 25-12; 1000 27-12		
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Quin. Bisulph 100 2 gr. 2-12; 1400 45-0			Equinine Java 4-4; Roche oz. 4-8		
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Septanilam 100 2-6; 1000 10-8			Antiphlogistin Trial 18-0; Small doz. 40-0		
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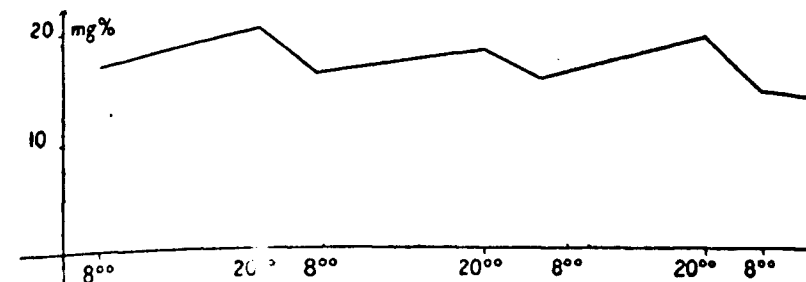
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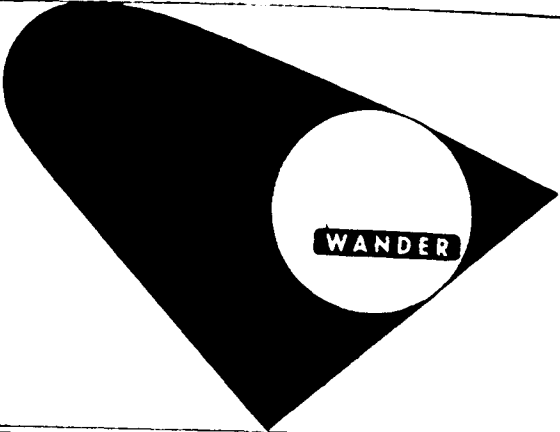
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Thornstein Guthe, M. D., M.P.H.,
Chief, Venereologist, W. H. O.,
Geneva, "Current Concepts of the Treatment of Syphilis", 1951.

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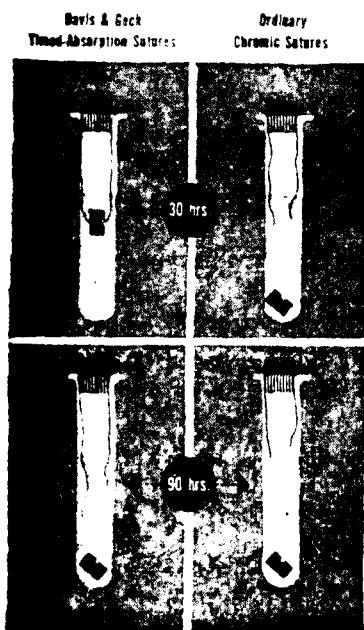
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"Vitamin B₆ is the most efficient therapeutic agent in nausea and vomiting of pregnancy." R. S. Willis et al. - Am. J. of Obst. and Gynec. 44 (1942).

Hart, McConnell & Pickett testify that Pyridoxine and Thiamine combined give better results than either of them singly.—Am. J. Obst. & Gynec. 48 (1944).

Montargil reports in Rev. Clinica Inst. Maternal 2 No. 4 (1949), cases that he has treated during early pregnancy. They came in with severe vomiting and consequent loss of weight. The general condition was poor. Other treatment having failed they were given Pyridoxine in daily doses of 50 to 100 mg. Intravenously. In all cases the vomiting stopped and the patients gained weight during the treatment.

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Edited by: Drs. U RAMA RAU & U. KRISHNA RAU, M.B., B.S.,

Asst. Editor: U. VASUDEVA RAU, M.B., B.S.,

Editorial & Publishing Office: 323-24, Thambu Chetty St., Madras-1.

London: 24/27, High Holborn W.C. 1. Bombay: 10, Homji St. Calcutta: 31, Beck Bagan Row.

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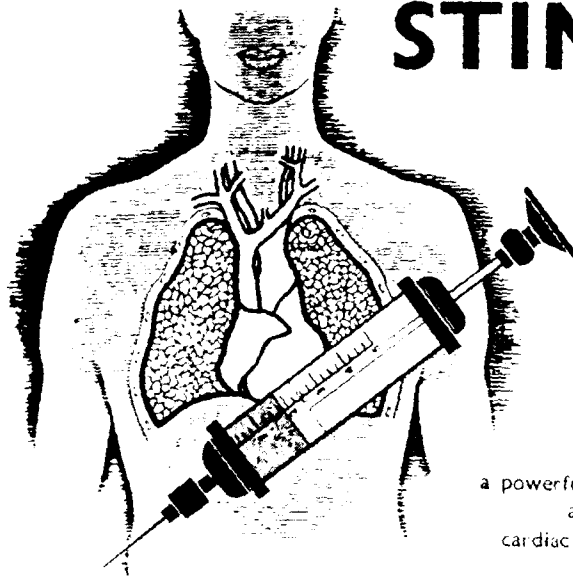
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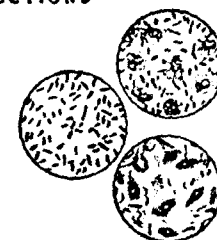


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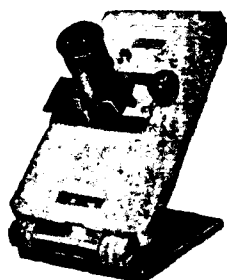
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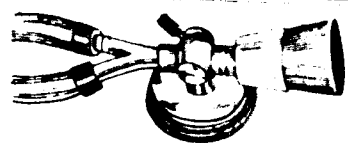
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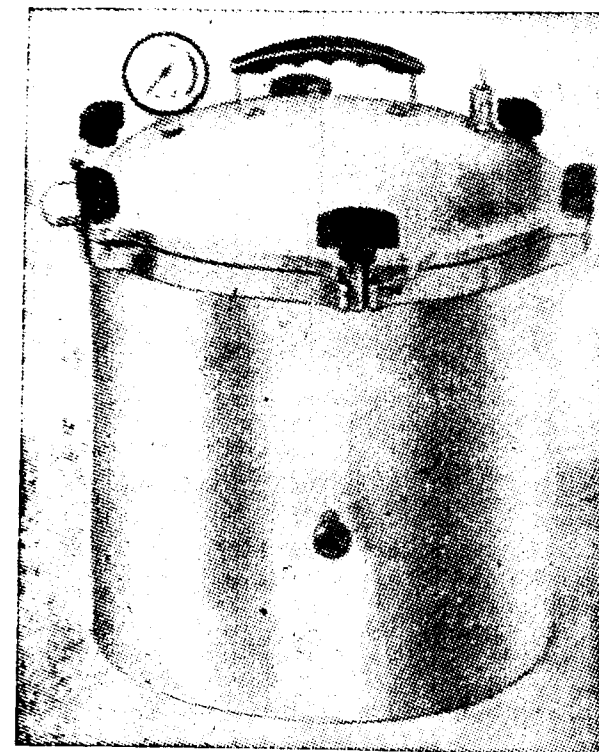
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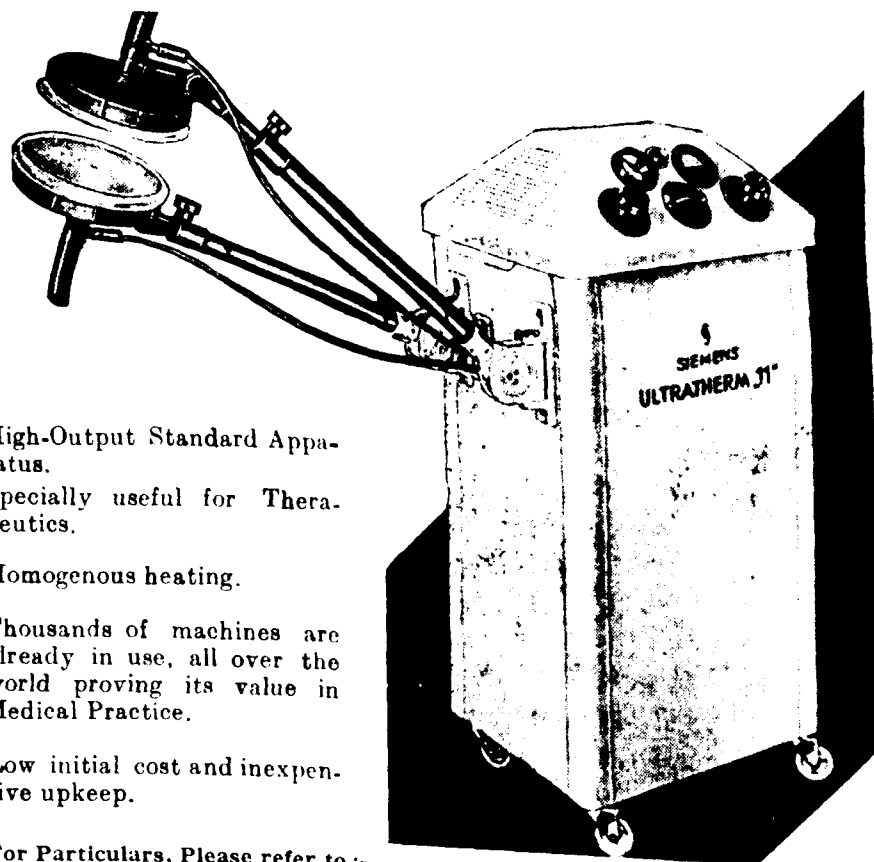
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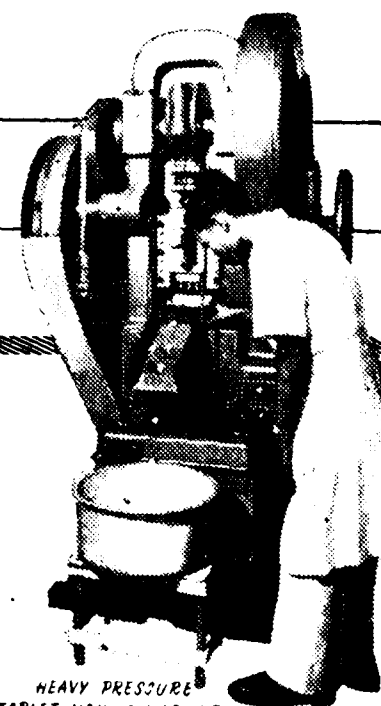
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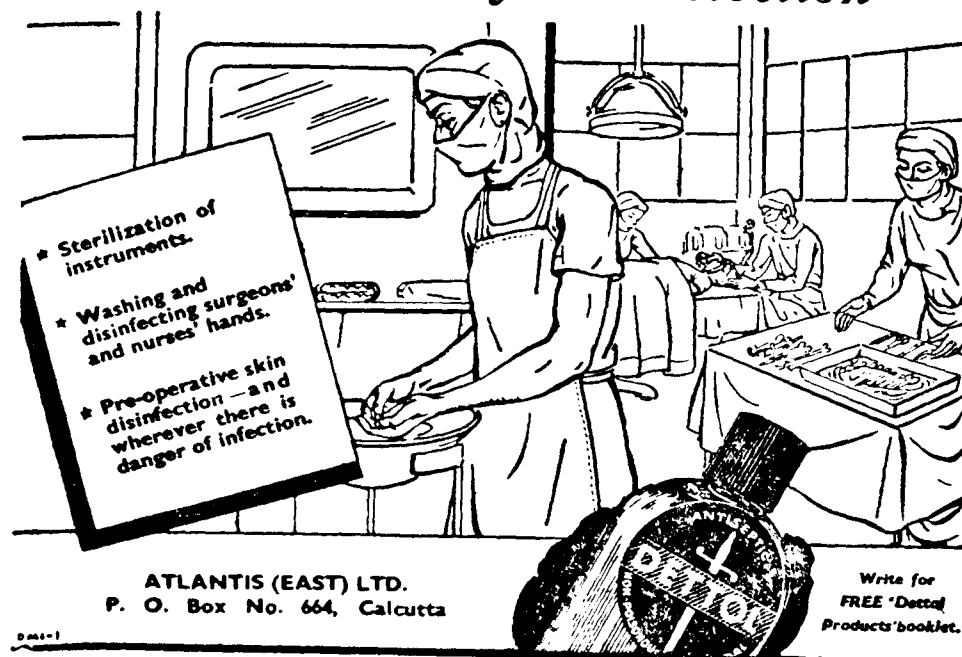
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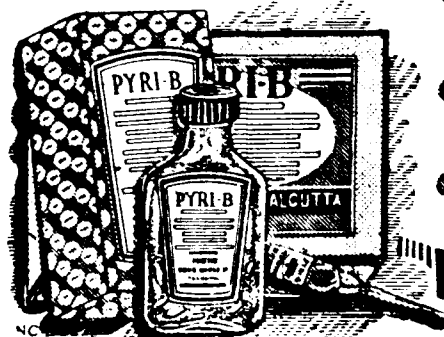
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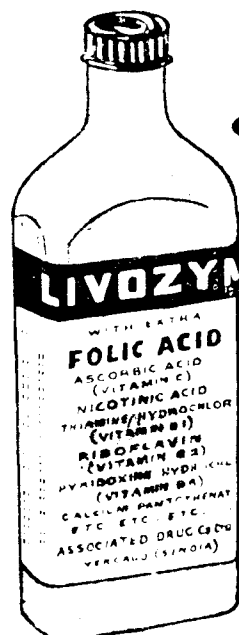
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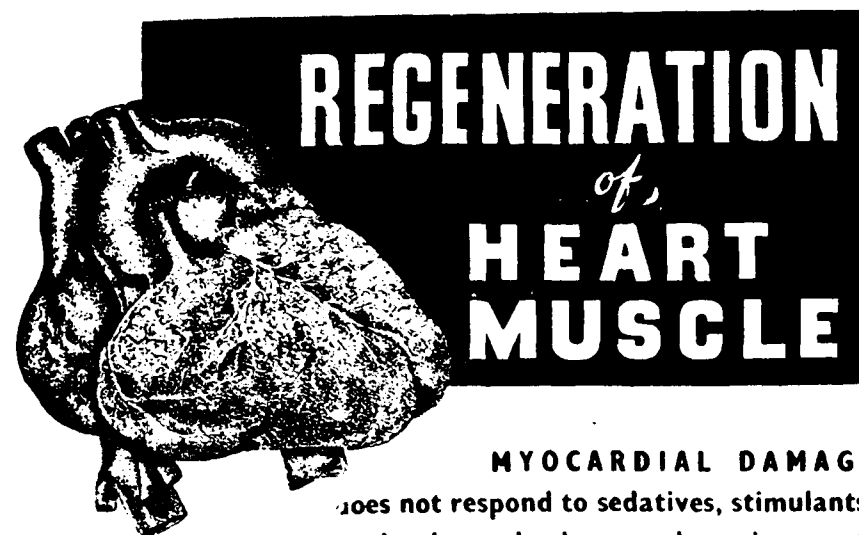


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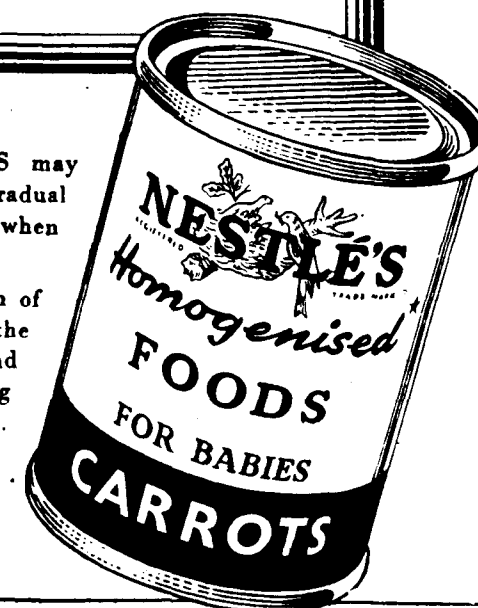
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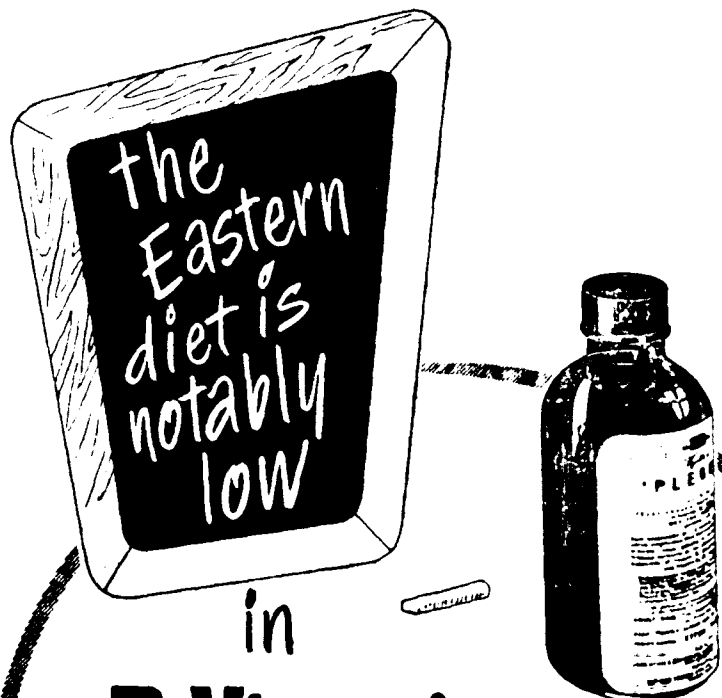


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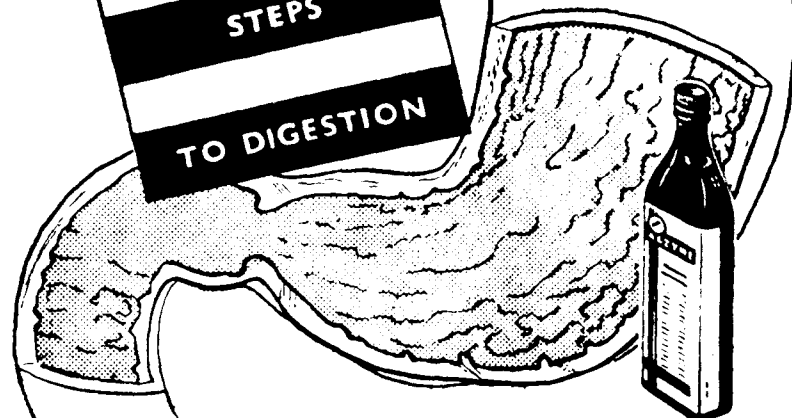
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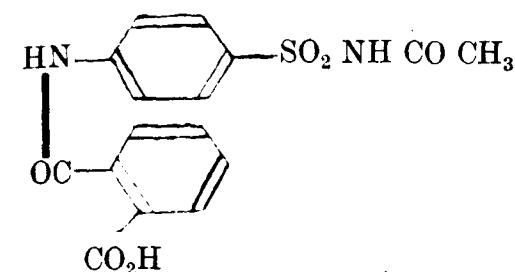
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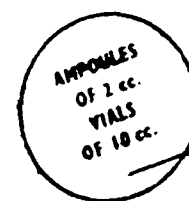
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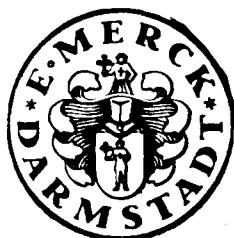


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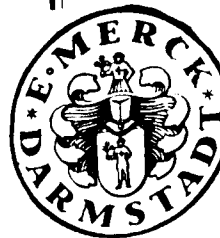


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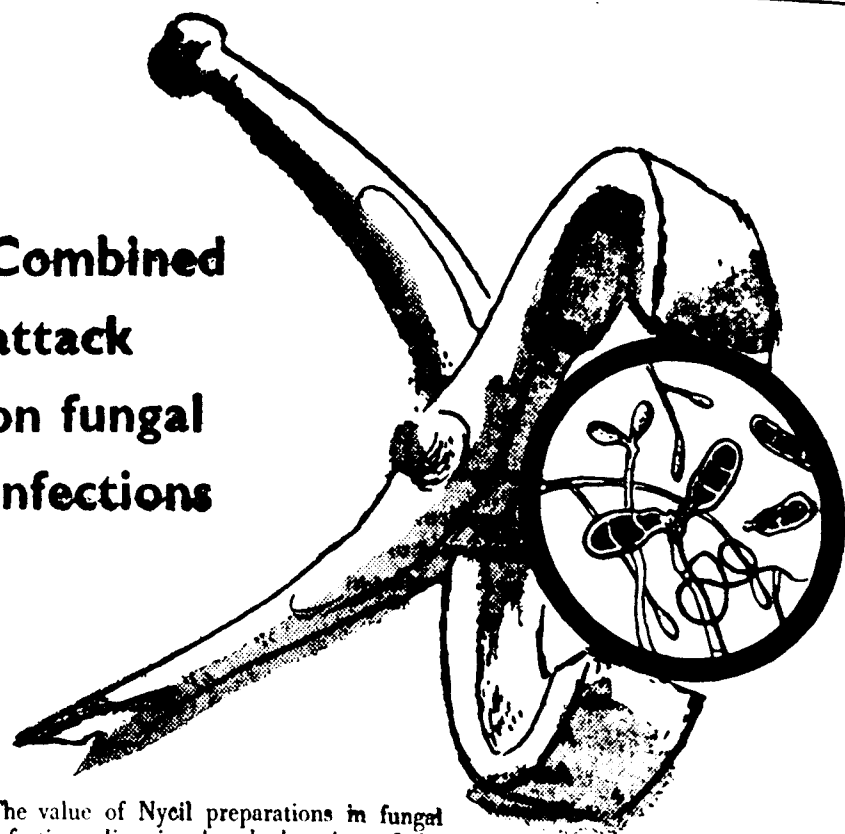
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ESTD. 1904.

A Monthly Journal of Medicine and Surgery

Published on the 15th of every month.

Editors: U. RAMA RAU & U. KRISHNA RAU, M.B., B.S.

Asst. Editor: U. VASUDEVA RAU, M.B., B.S.

Editorial & Publishing Office:

"RAMARAU BUILDINGS," 323-24, Thambu Chetty St., Madras-1.

Annual Subscription: Rs. 7-8-0: Foreign—Rs. 10—Post Paid.

Vol. 49

APRIL, 1952

No. 4

Original Articles

ARTIFICIAL PNEUMOPERITONEUM IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

DR. JOHN G. DAVID,

Medical Superintendent, The David Memorial Hospital,
Mehmadabad, Kaira District.

Historical.—Pneumoperitoneum was first used in the treatment of intestinal and peritoneal tuberculosis, about the beginning of this century; and in the course of such treatment a coincidental improvement in pulmonary tuberculosis was found by some observers. In 1933, Vajda first reported the use of pneumoperitoneum to elevate the diaphragm in patients with pulmonary tuberculosis, and described 2 cases both of which had a normally functioning diaphragm. There have since been several similar reports from Europe and America. In the majority of cases it was used alone without phrenic paralysis. Many of these were far-advanced bilateral cases with very poor prognosis, which had previously been unsuccessfully treated by other collapse measures, or had been found unsuitable for such treatment.

Later on, this was followed by inducing at the same time phrenic nerve paralysis of the more affected side resulting in remarkable benefit to the patient, as evidenced by the increased elevation of the hemidiaphragm as a result of the latter procedure. It has recently been found that pneumoperitoneum which was first used only for abdominal cases is particularly useful in the treatment of far-advanced cases of pulmonary tuberculosis in whom other collapse methods cannot be tried.

* Specially contributed to THE ANTISEPTIC.

Indications for pneumoperitoneum.—1. Far-advanced cases that would admit of no other procedure. These cases should be carefully observed for a few months before instituting the pneumoperitoneum treatment. To obtain beneficial results, the patient should remain stationary in bed-rest alone. It is often surprising to find a case, appearing first to take a down-hill course, getting stabilised and then beginning to improve rapidly after the induction of pneumoperitoneum.

2. Bilateral pulmonary tuberculosis with adhesive pleuritis contraindicating the application of A. P. In these cases, the vital capacity and the general condition of the patient must be carefully considered. The patients in this group respond well, especially when phrenic-nerve-block is utilised as an adjunct to pneumoperitoneum on the more diseased side.

3. Unilateral tuberculosis with adhesive pleuritis too acute or too inadequately stabilised to make thoracoplasty advisable. Pneumoperitoneum is not intended to supplant major surgery in these cases, but only to stabilise the lesion and prepare the patients for thoracoplasty. Astonishing results have often been obtained in some cases and the lives saved of patients who stood condemned as unfit for major surgery.

4. Predominantly basal lesions. A. P., is doubtless the treatment of choice. But in such cases pneumoperitoneum affords a direct means of attack which minimises the incidence of complications and yields very gratifying results. The results obtained are very good indeed, especially when combined with phrenic-nerve-block on the same side. This combined procedure is probably the best in basal lesions.

5. To enhance the effect of a paralysed diaphragm. It is found that the rise in the hemidiaphragm following a phrenic-nerve-block when aided by a pneumoperitoneum is very marked and the results are very encouraging.

6. Cases of uncontrollable hæmoptysis which is not controlled by pneumothorax because of the adhesions, respond remarkably well to pneumoperitoneum combined with nerve-block.

7. After lobectomy pneumoperitoneum helps to fill up the dead space.

Contraindications.—1. Far advanced disease with consequent low vitality.

2. Serious heart disease.

3. Severe abdominal disease.

4. Severe tracheo-bronchial tuberculosis.

Apparatus and technique.—The ordinary apparatus used for giving artificial pneumothorax may be used. There is no need to give morphia or any other sedative that is usually given during

pneumothorax. The patient is placed in absolute bed-rest while inducing the primary pneumoperitoneum and he continues to be in bed for a few hours after the successful induction of air.

Position of the patient.—The patient lies well-relaxed on his back with a pillow under his head.

Anaesthesia.—Procaine $\frac{1}{2}$ to 1% solution is always injected to avoid unnecessary pain.

Site of injection.—A point about one inch to the left of the outer border of the left rectus abdominis muscle and about two inches below the costal margin on that side, is chosen for the site.

Procedure.—The site chosen for the induction of pneumoperitoneum is painted with Tincture of Iodine and with a small calibre needle, procaine solution is injected at the site slowly and steadily pushing the needle towards the abdominal cavity, withdrawing the piston each time before injecting the solution so as to avoid blood vessels. With sufficient care and some practice one can feel the needle passing layer by layer into the peritoneal layer. Procaine is thus injected and the needle withdrawn. A needle of a bigger gauge such as is usually used for A.P. is connected to the A.P. apparatus and is slowly pushed into the peritoneal layer, making sure that the needle is not in a blood vessel, (a needle attached to a three-way cork in an ideal thing for this purpose) the cork is opened and the air allowed to enter slowly. There will always be a positive pressure and a small swing on the right hand side of the manometer. Unlike in A.P., one has to use pressure by raising the bottle containing water (where the two-bottle-method is used as when using Lillingston and Pearson's apparatus) or by pressing the cylinder (when Norman Beuthuen's apparatus is used). If the patient does not complain of any pain about 350 to 400 c.c. of air is injected and the needle then withdrawn. When pneumoperitoneum is well-established, a refill may be given with the patient lying on the side opposite to the paralysed hemidiaphragm and the needle is inserted in the mid-axillary line in one of the lower inter-spaces after carefully determining the site by screening the patient before the refill. Different methods of refill are used by different workers. It is a good plan to induct a small quantity of air at frequent intervals till a good pneumoperitoneal pocket is established and then continue the refill once a week, thus for example:—

First day about 350—400 c.c. of air; second day 400—500 c.c. of air; third day 500—600 c.c. of air; and then on the eighth day 500—600 c.c. of air. Then about 600 c.c. even 1000 c.c. of air may be given every week if found necessary. As this is liable to vary in different cases, the actual needs for the patients should be determined by experience in each case and the refills then made.

When the diaphragm has reached its maximum elevation (which is ascertained by fluoroscopy and X-ray of the chest) larger refills

to the extended use of pneumoperitoneum in the treatment of pulmonary tuberculosis also.

2. Far-advanced cases unfit for other kinds of treatment responded surprisingly well to pneumoperitoneum.

3. Complications noticed in pneumoperitoneum-treatment as compared with those observed in pneumothorax treatment are few and totally negligible. This has led to the preference of pneumoperitoneum to A.P. by many workers at the present day.

4. Indications, contraindications, the technique of administration and the side-effects are also indicated.

5. The results so far obtained point to the great usefulness of pneumoperitoneum in basal lesions as these respond best. Lesions of short duration though extensive, have also responded well.

6. Phrenic-nerve-block when used as an adjunct to pneumoperitoneum appears to help and accelerate the improvement.

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Description of the X-ray Pictures

1. (a) Skiagram dated 16-4-'51 taken on admission. Extensive bilateral disease—with large cavities on the right side.
General condition—poor. Hemoptysis.
- (b) Skiagram taken 25-7-'51. After pneumoperitoneum and right phrenic-nerve-block. There is no evidence of cavities.
Note:—The high elevation of the right hemidiaphragm due to phrenic-nerve-block. General condition improved. No hemoptysis.
2. (a) Skiagram on admission 11-3-'51.
Extensive bilateral with cavity on both the sides.
More disease active on left side.
- (b) Skiagram dated 11-6-'51.
After pneumoperitoneum and left phrenic-nerve-block. Good elevation of the diaphragm with marked improvement.
The patient is still taking P.P. as an O.D.P. and is working in a school as teacher.
Note:—The patient had been for a check-up on 3-2-'52 and the skiagram taken on that day shows that the lungs are practically clear.
General condition very good.
3. (a) Skiagram 15-8-'50 on admission.
Caseo-pneumonic type of disease affecting more than the upper three fourths of right lung field with huge cavity at the apex.
General condition—very poor. Temperature very high and of continuous type.

Artificial Pneumoperitoneum in the Treatment of Pulmonary Tuberculosis John G. David



FIG. 1 (a)



FIG. 1 (b)



FIG. 2 (a)



FIG. 2 (b)

FIG. 3 (a)
(Vide page 271.)

Artificial Pneumoperitoneum in the Treatment of Pulmonary Tuberculosis
John G. David



FIG. 3 (b)



FIG. 3 (c)

[Vide page 271]

BURNS

Capt. R. S. Kesava Raj



FIG. 1.—Before grafting



FIG. 2.—After grafting.



FIG. 3.—Denuded Area

[Vide page 275]

3. (b) Skiagram 14-9-'50—one month after starting right pneumothorax. Note the contraselective collapse and the adherent apex.
- (c) Skiagram 18-6-'51.
Right A.P. stopped. Right phrenic-nerve-block and pneumoperitoneum. (X-ray taken nine months after changing the treatment).

Note:—The high elevation of the hemidiaphragm on the right side. No definite cavity seen. Marked improvement in diseased area.

But the patient had still cough and slightly positive sputum and as the general condition was very good was advised to undergo thoracoplasty operation on the right side but he refused.

Conjugal Tuberculosis and its Bearing on the Etiology of the Disease

Snell studied the history of 835 married or widowed female patients with pulmonary tuberculosis, admitted to a tuberculosis home between the years 1940 and 1949 and attempted to correlate the presence of tuberculosis in their husbands. He found that only 68 (or 8 per cent) out of these 835 women had husbands in whom tuberculosis had been diagnosed. As many as 36 were widows whose husbands had already died of pulmonary tuberculosis; further investigations revealed the fact that in these cases the husband was very often the initial case. However, it was found in the course of this survey that 92 per cent of the husbands of tuberculous patients did not themselves have the disease in any form or at any time.

Snell says "it cannot be supposed that this is commonly because these husbands are not infected, but must be due to a high congenital or acquired resistance and/or to favourable environmental conditions."—(*Brit. Jour. of Tuberculosis*, Vol. 45, pp. 22-26, 1951).

Results of Treatment of Thrombo-Angiitis Obliterans by Means of Hypoglycæmia in 90 Cases

Kaniak has published a survey of 90 cases of Buerger's disease treated with insulin and mild hypoglycæmia. Up to 100 units of insulin was given twice a day and the patients were allowed to remain in a state of mild stupor; the hypoglycæmic state was interrupted after 2 to 3 hours by a drink of glucose or sweet tea. Most of the patients had previously failed to respond to other methods of surgical or medical treatment. A course of treatment lasted for 60 days. Some of the cases were of exceptional severity with trophic changes and gangrene. The cases were grouped according to the stage and severity of the condition. Of 49 patients with a mild form of the disease 38 (or 77.5%) made excellent recovery, and of 20 in whom the disease was very severe, 8 recovered and 6 were greatly improved. The follow-up period extended up to 2 years. Kaniak is unable to explain the rationale of the treatment, which has given such good results and but he believes that this form of treatment is of definite practical value and should be tried before other and more drastic measures are carried out.—(*Polak Arch. Med. Weim.*, 20, 296-305, 1950.—Eng. Abst.).

BURNS*

By Capt. R. S. KESAVA RAJ, Civil Surgeon,
Dt. Medl. Officer, Eluru, W. Godavary.

BURNS probably stand foremost amongst the common everyday accidents. It is common in households and involves mostly children and women. Burns are produced by dry heat coming in contact with the body surface while scalds are produced by moist heat like steam or hot water. Burns are of various degrees, depending on the extent of the area of the body involved and the age of the victim. A first degree burn or scald is marked by reddening and light blistering, and if extensive is particularly dangerous to children.

Second degree burns or scalds are marked by enough redness and blistering and by the destruction of some of the epidermis; but considerable areas of the basal layer and dermis would make a complete cutaneous layer after healing.

Third degree burns or scalds are marked by portions of the body turned black by fire or turned white by hot air, liquids, steam or chemicals. This denotes the death of the entire skin, though islands of unaffected tissue may be found here and there.

First Aid.—Consists in taking proper precautions to save life and property. Application of a 5% solution of bicarbonate of soda to the burnt area is useful and in an emergency gauze soaked in this solution may be applied to the burnt area even without preliminary cleaning. Better results are obtained from gauze soaked in liquid paraffin or from a sulphonamide vaseline gauze. Burns of the face are best treated by face masks of vaseline on lint, with vaseline applied especially round the nose and the eye-lids. Extensive burns of the extremities are made far more comfortable and better fitted for transporting when immobilised by splinting. Cases of severe burns require prolonged hospitalisation, take up a great deal of the time and energy of the nursing staff and of the doctors too. These cases also reduce the number of available beds for the other patients.

TREATMENT OF BURNS:—May be divided into:—(1) General treatment; (2) local treatment; and (3) after-treatment.

General treatment:—The first consideration is saving of life. Burns cause death through shock, toxæmia and sepsis. For every case of death due to shock and toxæmia, there may be roughly two cases of death due to sepsis. The sepsis is due to the bacterial infection derived from the dirty cloths, mud, etc.

Shock.—"The sudden severe pain and the intense psychic stimulation result in neurogenic or primary shock, which is transitory and responds satisfactorily to proper drugs and to reassurance.

Secondary shock appears several hours later and is a serious complication. In some patients, extensive burns may cause little physiologic disturbance, while in others profound depression or shock may result from apparently minor burns." (Ilgenfritz). Morphia $\frac{1}{4}$ grain is indicated, and may be repeated if and when required in cases of primary shock. Shock due to burns is now more easily controlled due to the availability of blood and plasma for transfusion. Secondary shock is due to rapid and continued loss of fluid from the vascular system. Profuse oozing of protein-containing fluid takes place through the injured capillaries in the regions of the burns with a consequent reduction in the total and in the circulating volume of blood, a drop in the blood pressure and a decrease in the cardiac output. Hæmo-concentration due to loss of fluid develops within a few hours and the blood viscosity is consequently increased, further retarding the velocity of flow through the capillaries. Though toxins from the injured area might contribute to the shock, it is probable that the rapid loss of fluid from the vascular system *per se* is sufficient to account for the circulatory collapse. Shock could be expected in persons having burns on 15% or more of their body surface. The treatment for shock should be undertaken without delay in anticipation of symptoms. Replacement of plasma by plasma would be the ideal and it is essential that the treatment should be continued for at least 24 hours. The shock due to plasma loss would thus be controlled. Moderate burns *i.e.*, those involving 20 to 30% of the body-surface will require 5 to 10 pints of plasma in the first 24 hours while severe burns *i.e.*, those involving 30% or more, may need 15 pints or more in the early stages at the rate of a pint an hour. Glucose-saline is useful after the initial period to overcome the dehydration due to vomiting. It would be advisable to delay the local treatment for burns to a later stage if the patient is in shock, rather than proceed to attend to the local condition of the patient while he is still in shock. The patient in shock, should be laid on bed with sterile towels to lie on and to cover him with. All clothing should be cut away and removed. When the patient's condition allows, treatment for the local condition should be started.

The following figures would serve as a guide to assess the extent of the body surface affected:—

The area of the head is	...	6	per cent of the body surface.
The trunk	...	38	" " "
The upper arm	...	3	" " "
The fore arm	...	3	" " "
The hand	...	2½	" " "
The thigh	...	9½	" " "
The lower leg	...	7	" " "
The foot	...	3	" " "

(Berkow)

As stated above a burn involving 12 to 15% of the body surface may produce shock in adults.

* Specially contributed to THE ANTI-SEPTIC.

Local treatment:—The burnt surface is cleansed with a swab soaked in 1 to 1.5 per cent solution of cetyl trimethyl ammonium bromide (with the trade name of Cetavlon). It acts like soap, has a strong bactericidal action and penetrates deeply into the hair follicles and sweat glands. All dirt is carefully removed with a pair of forceps. The blisters are cut out. Dressing is done with sterile vaseline after dusting with sulphonamide powder. Sufficient sterile cotton wool and pressure bandages are applied. For dressing round the chest and abdomen bandages would be embarrassing, so the dressing should be kept in position, by sticking plaster. Pentothal sodium would do for anaesthesia or nitrous oxide gas and oxygen inhalation. Even the morphia that was given would be enough to keep the patient quiet during the dressing. Thorough initial cleansing is essential for obtaining good results. The dressings once applied need not be removed till about the 3rd day and then only if the smell is offensive or foetid or if the patient is running a temperature. Re-dressings are done with sterile vaseline gauze. If there is profuse discharge from the wound a change to eusol dressing would help. The adult patient is put on injections of penicillin and also on sulphathiazole by mouth—a total of 20 gm. during the course of 3 days to be given in 4 hourly doses. Morphia may be repeated if necessary. Enough fluids by mouth, much more than the normal requirements i.e. (5–6 pints per day) should be given.

ACCESSORY TREATMENT:—A high protein-diet should be given, and for progressive anaemia—blood transfusion. Adequate splinting is essential to prevent deformities when burns are in or near the joints. Vitamin C will assist in quicker healing by the deposition of fibrous tissue.

AFTER-TREATMENT:—Special nursing is essential. Nothing is more taxing to a nurse than the attention she has to bestow on a case of burns. Movements especially of the fingers should be encouraged from the time of application of the first dressing.

Skin-grafting.—Early skin-grafting will reduce the number of days of stay in hospital, avoid scarring, deformity and also improve the functioning. The presence of mild sepsis should not be a bar to this procedure which could be done by any surgeon. Where frank pus is present some form of pinch-graft should be used. If the exudate is largely serous, a Thierch's graft will usually take. The presence of reasonably healthy granulation is the one essential in skin-grafting. I have been following a method for Thierch's graft, which is as follows:—When the patient is fit for grafting i.e., when the area is covered with sufficient healthy granulation tissue, the excess granulation tissue is freshened by gentle scraping under anaesthesia—the oozing of the blood is controlled by applying hot pads and pressure with the hand. While the hot pads are still on the area to be covered, slices of skin by the Thierch's method are shaved and spread out on a vaseline gauze with the outer surface of

the skin shavings close to the vaseline gauze. The slices of skin stick to the vaseline gauze—more layers of the skin shavings are spread out on the vaseline gauze. While the surgeon is busy shaving the skin—the assistant keeps the skin lying on the vaseline gauze moist, by squeezing on it saline from a gauze piece. When sufficient skin to cover the area prepared has been shaved, the skin on the vaseline gauze is cut into small pieces—and applied on to the area to be grafted. Various sizes and shapes could be cut to cover up the recipient area. A warm pad is now applied on the grafts and gentle but firm pressure is applied with the hand of the surgeon. The pad is gently removed off the grafts, leaving the grafts lying on the area with the pieces of vaseline gauze cut along with the skin still sticking on. These pieces could be removed one by one leaving the grafts firm on the area. Over these grafts, two layers of dry gauze are laid and kept in position by adhesive plasters running over the free flowing margins of the gauze to the healthy skin. The whole area is then covered with sterile dry pads of cotton wool. A loose many tailed bandage could be applied over the cotton wool to keep it in position. At intervals of 3 hours the cotton wool is lifted and penicillin solution—500 units in 1 c.c. of the solution—is to be instilled on to the grafts. The instillation should be sufficient to moisten the gauze lying on the grafts liberally. This instillation is to be done for three days. At the same time the patient is given intramuscular penicillin and sulphathiazole by mouth. Care should be taken not to disturb the grafts during these three days. If possible the area could be immobilised with splints. On the 4th or 5th day, the overlying pieces of gauze on the grafts are gently taken out after moistening them sufficiently with hydrogen peroxide. A good deal of patience is required in lifting up the gauze or else the graft also might come off with the gauze, resulting in waste of time, labour and energy. By the use of the above method almost 100 per cent. of skin grafts take successfully.

Visceral complications of burns.—**Liver damage:**—This was probably due to absorption to tannic acid, when treatment with it was in vogue.

Renal damage does happen due to secondary shock and diminution of renal blood flow, most of the damage occurs in the tubules of the kidneys. Clinical evidence of renal damage includes oliguria, albuminuria, casts in the urine and elevation of blood non-protein nitrogen.

Acute ulceration of stomach and duodenum:—Occurs only very rarely.

Burns of the extremities:—If the burn is extensive the hand or feet should be incorporated in the dressing even if they are free, otherwise interference with venous return and oedema would result due to the tight bandage proximally.

Burnt fingers and toes must be dressed separately to prevent adhesions between them and early movements must be given to

them. The fingers should be kept slightly flexed, thumb slightly abducted and wrist in slight extension. The foot should be at right angles and other joints in slight flexion.

Burns of the face:—Compression bandage should be used with openings for the eyes, mouth and nose, eyes should be irrigated with sterile saline and lubricated with sterile castor oil or liquid paraffin. Penicillin solution 1 c.c. containing 500 units of penicillin may be instilled into the eyes.

Burns over the perineum:—Apply vaseline gauze. Burns due to explosions of either petrol or ammunition, heal slowly. In an acid burn, apply alkali. In an alkali burn, apply acid (vinegar) for cleansing.

Phosphorus burns:—Wash with 2% sodium bicarbonate and treat with 2% copper sulphate. No oily dressings should be used.

Scars:—A healed wound near the flexures of the body like axillæ, groins, neck, popliteal and cubital regions and near the mouth and eye-lids leave scars which contract and produce deformities and give a hideous appearance to the face. They disable the person considerably. Deformities could be prevented to a certain extent by proper splinting to keep the limbs and neck region in extension during the course of healing. Skin grafting would prevent bad deformities. If scars have formed they could be gently massaged with paraffin to keep them soft and by encouraging early movements. If deformities have been produced the scars could be excised completely after 2 or 3 months, and the deformity corrected and the limb could be kept in firm splints.

To summarise.—1. Treat the shock with morphia—plasma—whole blood or intravenous fluids and reassure the patient.

2. As far as possible avoid contamination of the sterile wound—the wounds produced by burns are ordinarily sterile.

3. Give a thorough initial cleansing with Cetavlon under anæsthesia if necessary.

4. With aseptic precautions dress with sulphonamide vaseline gauze—sulphathiozole by mouth and injections of penicillin.

5. See that the patient gets plenty of fluids over and above the average normal intake of 5 to 6 pints a day.

6. For burns of the digits and burns around the joints, start early active movements. Even one single movement a day would be enough to prevent stiffness.

7. Early skin grafting will effect a speedy recovery.

8. Later-treatment of scar is by excision and grafting.

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SPEECH AND ITS DEFECTS *

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SPEECH is an extremely complex activity. It is a method or form of communication of thought between individuals. The first step in the development of speech occurs when the infant associates sounds with the perception of objects (word hearing). An area for memory of words develops in the superior temporal convolution on the left side in right-handed individuals. By 18 months, a small vocabulary of about 30 to 40 words will have developed. They are produced by the motor tracts from the cortex of the insula and the posterior part of the third left frontal convolution. The growth of speech develops *pari passu*, with the growth of mind and by the third year the child is able to understand what others speak and can make others understand what he speaks. As the child begins to read, he associates letters and words with the sounds which he is already familiar with.

Speech area.—This is an U shaped area of the cortex of the left hemisphere.

1. Posterior end of the third frontal convolution and insula (Broca's area).
2. Superior temporal convolution.
3. Angular and supramarginal gyri.
4. Posterior end of the second frontal convolution.

Now we shall deal with the afferent and efferent fibres.

Afferent fibres.—1. From the calcarine visual cortex to the angular and supramarginal gyri. Lesions of this pathway produces inability to appreciate written speech or "word-blindness."

2. Afferents from the auditory area to the superior temporal convolutions. Lesions of these produce "word-deafness" or inability to understand spoken words.

3. Afferents from the thalamus to the superior temporal convolution. These fibres are concerned with the sensations produced in the movements of articulation. Lesions will produce inability to control the correctness of speech movements.

Efferent fibres.—Arise from the speech area on the left side and pass to the left pyramidal tract. The fibres are connected with the corpus callosa and the opposite cerebral hemisphere and pyramidal tract.

Blood supply.—The left middle cerebral artery supplies the speech area. There are two branches, the posterior branch and the anterior branch. The anterior supplies the posterior ends of the

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second and third frontal gyri and insula. The posterior branch supplies the rest.

Classification of aphasia.—Aphasia may be motor or sensory. In motor aphasia the patient may be completely speechless or able to say only yes or no. The speech may be telegraphic. The nominal aphasia is a type of motor aphasia. In nominal aphasia, when an object is held before him, he can recognise it but cannot name it. The lesion is in the posterior end of the third left frontal convolution.

Agraphia.—*Agraphia* is the term first used by Ogli and describes the inability of the patient to express meanings in written language. He cannot convey thoughts in writing or write names of objects. The lesion is in the posterior end of the second left frontal convolution. A good example is the case of Dr. Samuel Johnson, who had difficulty in writing and who did not know why or how he made wrong letters. *Acalculia* is a defect in the use of mathematical symbols and may occur after a left parietal lesion. *Amusia* is a defect of musical expression or appreciation due to a cerebral lesion.

Sensory aphasia is a defect in the cortical receptive areas for word-vision or word-hearing. The following are the varieties:—

(1) *Word blindness or visual aphasia*:—It is due to a lesion of afferent fibres from the visual cortex to supra-marginal and angular gyri. The patient sees but cannot recognise printed or written characters.

(2) *Word deafness or auditory aphasia*:—It is due to the lesion of the fibres from the auditory area to the superior temporal convolution. The patient can hear but cannot understand speech.

Developmental speech disorders.—Developmental speech disorders are generally of the sensory type. Congenital word-blindness is commoner than congenital word-deafness. The child can speak intelligently and can even repeat by heart but the child cannot be taught to read. Therefore, the printed word is wrongly pronounced. In congenital word-deafness the hearing is normal, the child responds to noises, but cannot understand spoken words; if he does attempt he only babbles.

Apraxia is disorder of a cerebral function, characterised by inability to do purposive movements, when required to do so, although there is no paralysis. Apraxia may result from both general and local diseases of the brain. It may be met with in G.P.I. The condition may be motor or sensory. In motor apraxia the patient knows what he wants to do, but he cannot do anything, although the hand is not paralysed. The cause is due to the lesion in the posterior part of the left pre-frontal area.

Agnosia is sensory apraxia. In this condition the patient cannot appreciate the nature of objects. If given a fountain pen and asked to use it, he may put it into his mouth and try to

smoke, thinking it is a cigarette. Agnosia is due to a lesion in both parietal regions.

Dysarthria.—Dysarthria is a disorder of articulation. If the patient is unable to articulate totally, he is said to be anarthric. Dysarthria may be due to:—(1) Upper motor neurone lesion. The muscles of articulation are supplied by both cerebral hemispheres. Hence lesion on one side does not cause dysarthria. Dysarthria is produced only by bilateral pyramidal lesion as in congenital diplegia. Pseudo-bulbar palsy produces spasticity and weakness of the muscles of articulation. A slow slurring indistinct articulation will result. (2) In striatal disease, a thin monotonous voice is produced by muscular rigidity. (3) In ataxic dysarthria the syllables are separated in a staccato fashion. This occurs in lesions of the cerebellum or in its medullary connections. (4) Lower motor neurone lesions cause weakness and wasting of the muscles of articulation e.g., progressive bulbar paralysis. (5) Myopathy is disease of the muscles as myasthenia gravis or fascio-scapulo-humeral dystrophy leads to dysarthria. Dysarthria is due to progressive disorder and so very little can be done. Speech training may be given by local gymnastics.

TREATMENT OF APHASIA:—Patience and perseverance are necessary in the treatment of aphasia. By gradual training and teaching it is possible to restore the normal function to some extent.

Palilalia:—Palilalia is a disease characterised by a repetition of a phrase with increasing rapidity. The cause for this condition is obscure. It is met with in post-encephalitic parkinsonism and in pseudo-bulbar palsy.

Lalling:—Lalling or infantile speech occurs in mentally retarded children.

Lisping is a defective enunciation of certain consonants. A speech-training expert will help to improve this condition.

Mutism is complete loss of speech in a conscious patient, in the absence of any disease of the nervous system. It is met with in cases of hysteria.

Deaf-mutism is due to congenital deafness, which prevents the child from learning to talk; but such children have usually a good command of gesture.

Idioglossia is a condition wherein the child uses a wrong consonant or rather he substitutes 3 or 4 consonants; in other words, he uses a speech of his own.

Aphonia:—The voice becomes a whisper, but speech is preserved. The disease is due to involvement of the laryngeal muscles as in laryngitis or paralysis of the recurrent laryngeal nerve. Hysterical aphonia may be produced by emotional shock.

Stammering.—Last but not least, is the disorder of speech known as stammering or stuttering. It is a disturbance of articulation not caused by organic nervous disease. The incidence is

greater in boys than in girls. It is common in left-handed children and is probably provoked by teaching left-handed children to write with the right-hand. It was Orton, who divided this into 4 groups:— (1) Those in whom shift from left to right hand was enforced; (2) those who have been slow in selecting a master-hand; (3) those with a family history of stuttering; and (4) those with none of the three above characteristics. Orton maintains that these children show no psychological abnormality.

SYMPTOMS:—The flow of speech is interrupted by pauses; the patients stick to the consonants particularly the explosives and labials. For proper speech, three muscular mechanisms are necessary:—(1) The respiratory mechanism for a supply of the blast of air; (2) the larynx for producing the voice; and (3) the muscles of the tongue, jaw, palate and lips for articulation. Stammering is due to a want of the necessary co-ordination between these three mechanisms.

PROGNOSIS:—Mild stammering may disappear without treatment. In the severe types, thorough treatment may produce good improvement.

TREATMENT:—1. Attention should be paid to general health. The patient may be advised to speak or read, recite in a large room all alone loudly, slowly and distinctly.

2. Breathing and singing exercises and gymnastics are useful. Above all self-confidence and self-reliance are essential. When he comes to a word on which he stammers, he should raise his voice and concentrate his attention for proper articulation. When stammering occurs in a left-handed child who has been made to use his right hand, a return to the use of the left hand often results in good improvement.

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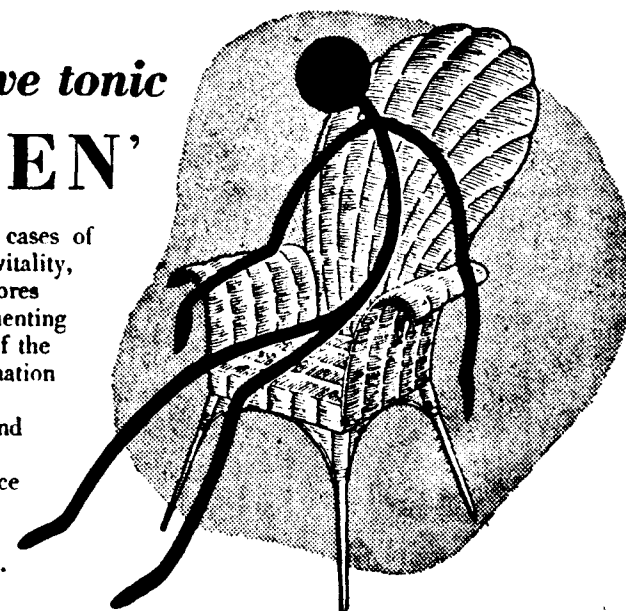
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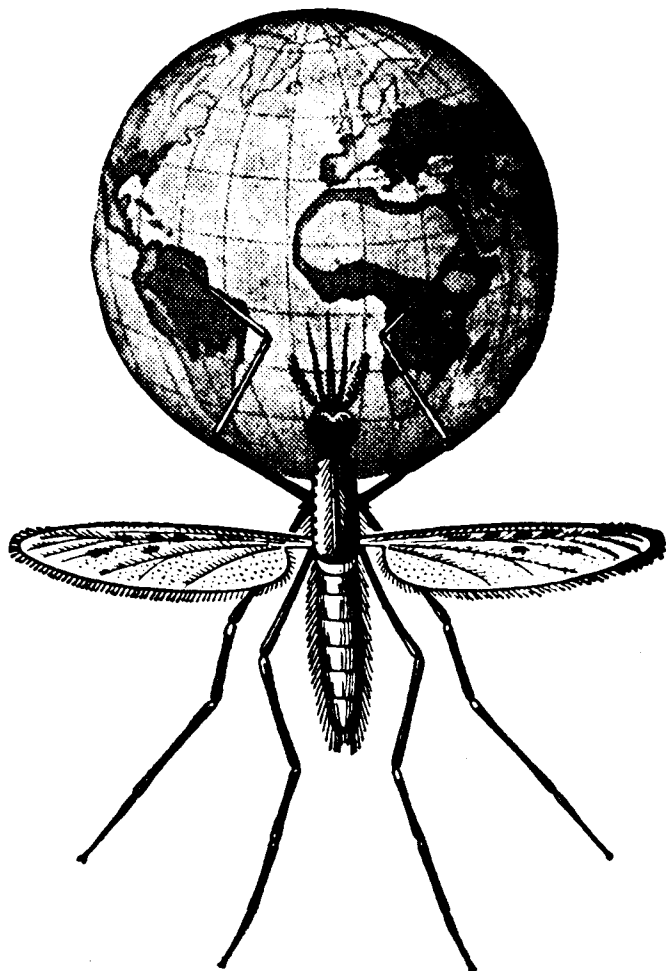
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RELAPSES IN FEVERS OF TYPHOID PARATYPHOID GROUPS*

PROF. J. M. PACHECO de FIGUEIREDO,
The Director of Medical College, Goa.

THE introduction of antibiotics in medicine marks a great advance in modern therapeutics.

The marvellous results obtained with their use have greatly changed the prognosis of several diseases which previously levied a heavy toll of human lives.

The old dream of Ehrlich—a *therapia sterilisans magna*—about the discovery of agents acting directly on the germ without harming its host is today an accomplished fact.

Physicians of tomorrow will not be able to realise our anxieties of today; formerly a case of typhoid fever with its inflexible temperature chart, with its septenaries falling, and a total indifference for the treatment instituted, was a matter of grave concern to patient and doctor alike, but now antibiotics have been able to control the temperature and other sequelæ.

At the same time with the use of antibiotics we have new problems to face and one of them is "relapses in the group of typho-paratyphoid fevers treated with chloromycetin."

Though chloromycetin is comparatively scarce and expensive in the Indian market, I had the opportunity of trying it on several patients. This paper is based on observations made on seventeen patients treated in this hospital who showed toxic manifestations, some with the ataxo-adynamic type.

During treatment we observed the following:—

(1) In the majority of patients treatment started at the end of the second or during the third week.

(2) The initial adult dose was between 1½ and 3 grammes, the maintenance dose being 3 grammes until the fall of temperature; after that one capsule was given every 3 or 4 hours for a few days and then every 6 hours.

(3) The temperature fell on the third day in one patient, on the 4th, 5th and 7th day in 9 patients (three in each group) and on the 6th day in six patients. The beneficial results of the drug were felt within 48 and 72 hours and the temperature came down by lysis.

(4) The dose was not uniform owing to the scarcity of the drug in the market.

(5) We did not observe any marked toxic symptoms due to the drug. Only a few patients suffered from nausea, vomiting, diarrhœa, dysuria and exacerbation of nervous symptoms but there was no need to stop the treatment.

(6) The toxic condition, chiefly the delirium kept on in a few cases for 48 hours after the fall of temperature.

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(7) Of sixteen patients, eight had relapses giving a percentage of 50.

(8) *The probabilities of relapses decreased with the increase in the duration of treatment.*

(9) The relapses occurred as a rule two to three weeks after the temperature fell.

(10) One of the patients (Obs. No. 14) with the classical symptoms of typhoid had two relapses, the first one at home and the second one in the hospital. The dose in the first treatment was 24 grams, in the second 30 grams, and in the third 27 grams. The second relapse was on the 15th day though the duration of treatment was 18 days with a total dose of 30 grams. The Widal and Weil-Felix reactions were negative though the first became positive after specific vaccine-therapy.

(11) Prolonged antibiotic treatment alone does not appear to be adequate to cure late relapses.

(12) In two cases of relapse the fresh administration of chloromycetin showed an absence of resistance to the antibiotic.

(13) Chloromycetin does not seem to change the course of the anatomo-pathologic lesions once established. Patient No. 3 died of myocarditis on the 7th day of treatment and patient No. 9, on relapse had an intestinal perforation.

We have treated typhoid fevers for many years in Portuguese India where they are endemic, with seasonal exacerbations. We did not then have relapses so often as now, after the advent of chloromycetin. Although some French authors are of opinion that the percentage of relapses is the same (21%) for the patients treated either with chloromycetin or by the old methods we are unable to agree with them, as in our experience only 5% of those treated by the old methods had relapses. Of 42 patients treated without chloromycetin in our medical wards, three died and only one had a relapse. Woodward in 1947 in his first experiments with the drug, noticed 2 cases of relapse in two patients, Bradley 3 cases in 9 patients, Patel 1 in 6, El Ramby 9 in 17, Knight, 4 in 13. Finally, Cristiano Nina and Arnaldo Sampaio in their work noticed that in 29 and 48 patients treated for eight days with chloromycetin, the percentage of relapses was respectively 55 and 50%, the same as ours. Nina and Sampaio think relapses are due to the absence of specific antibodies. Admitting that the action of chloromycetin is purely bacteriostatic or bacteriostatic (Bigger) we cannot understand why relapses are more frequent in patients receiving treatment in the advanced cases of evolution of the disease later when the organism should be better prepared for a decidual and humoral defence.

French authors (Laporte, Fritel, Recordeau, Betourne, Mollaret, Reilly, Bastian and Tournier) think, relapses are brought

about by the persistence of "microbial nests" in the mesenteric lymphatics.

Biopsy of the ganglia shows necrosed, not vascularised areas where the bacteriostatic action of the drug cannot reach. It is enough that the formation of new vessels assures the permeability of these foci for the germs to get into the circulation and bring on relapses.

From the above observations, we reach the conclusion that the clinical cure and the establishment of immunity do not go together as the infective focus persists in the ganglia. To overcome this, it will be necessary to continue the administration of the antibiotic for sometime after the patient is clinically cured and facilitate the formation of antibodies by specific vaccine-therapy.

Smadel advises to give the drug for 10 to 14 days in a minimum total dose of 30 grammes.

Nina and Sampaio treated 7 patients for 14 days and did not get any relapses. Morin sees no advantage in starting the treatment with an initial loading dose (12 capsules for an adult of medium weight); he recommends fractioned daily doses of 50 mgrs. per kilo of body weight. This dose can be maintained till the end of the treatment or decreased to a third two days after the fall of temperature to normal, and to half until 14 days. There is need to watch the patient on the first three days of treatment, particularly those who are very young and dangerously ill; the increase in torpor, marked acceleration of the pulse, fall in the blood pressure 24 to 72 hours after starting the treatment are, according to Mollaret, indications to reduce the dose or stop the antibiotic for sometime.

Many are the techniques advised for the specific vaccine-therapy. To our patients we give T.A.B. vaccine on the 3rd or 4th day after the fall of temperature to normal, in progressive doses $\frac{1}{2}$, $\frac{1}{2}$ and 1 c.c., (adult) at intervals of a week.

In the present state of our knowledge we consider that the best way to avoid relapses is:—

- (1) Early administration of chloromycetin for 14 days with or without an initial loading dose.
- (2) Specific vaccine-therapy in progressive doses starting on the 3rd day of apyrexia $\frac{1}{2}$ c.c., $\frac{1}{2}$ c.c., and 1 c.c.
- (3) Medical supervision of the patient for at least 20 days after the clinical cure.

References:

1. J. E. Smadel—Clinical Use of Chloromycetin, in the Journ. of the Am. Med. Ass., No 5, 1950.
2. C. Nina—Problemas e aquisicoes recentes na febre tifoide, in Gaceta Medica Portuguesa, No. 1, 1950.
3. C. Nina—A Cloromicetina na febre tifoide, in A Medicina Contemporanea, No 4, 1950.
4. L. P. Bastos—Cloromicetina e Aureo-micina, in Portugal Medico, No 6, 1950.
5. Laporte, Fritel, Recordeau et Betourne—Les problemes des rechutes dans les fievers typhoides et paratyphoides traitees par la chloromycetine, in La Presse Medicale, No 58, 1950.
6. M. Morin—Traitement des fievers typho-paratyphiques par la chloromycetine, in La Presse Medicale, No 63, 1950.
7. International Medical Digest.

Investigations done.—*Urine*: nil abnormal. *Blood*: no malaria parasites seen. Relative polymorpho-nuclear preponderance. *Faeces*: nil particular. *X-rays both tibiae*:—No bone nibbling at upper and medial ends seen. Kahn and Wassermann tests of mother's blood: Negative. Patient's blood cholesterol: 450 mg. per cent. Patient's blood cholesterol repeated: 470 mg. per cent.

Lumbar puncture:—Fluid clear; Pressure 60 drops per minute; no spinal block; C.S.F. 15 cells per cm.m.; Pandy's test for protein negative; Chloride 730 mg. %; Protein 60 mg. %; sugar 63 mg. %.

X-rays of wrist and palm:—Two carpal ossifying centres; thus no sign of retarded growth seen. No signs of rickets seen. Humerus: nil particular.

X-rays skull:—Nil particular. No separation of sutures seen. Pituitary fossa: nil particular. X-ray's spine: nil abnormal. No changes in spine suggestive of gargoylism seen.

X-rays of cervical region:—Seven cervical vertebrae seen.

Study of fundi:—Discs, margins regular; white in colour; *Vessels*:—Arteries thinner than normal, veins slightly larger. *Retina* looks hazy throughout. No exudation or hæmorrhage seen. Picture suggestive of optic atrophy; pupils dilated and inactive with direct and consensual. Fundi show yellowish white crystals all over (cholesterol?). The picture is suggestive of a primary optic atrophy in both eyes.

The child kept a normal temperature throughout her stay in the hospital.

Weight of the child:—21-2-1943: 18 lbs. 7-3-1943: 19 lbs. 28-3-1943: 20 lbs.

Comment.—From the clinical data the following points are important:—(1) Onset of the condition with fits and vomiting. (2) The presence of cerebral blindness. (3) The presence of spastic paraplegia. (4) Increase in cells and protein content of C.S.F. (5) The presence of non-consecutive optic atrophy. (6) The presence of high blood cholesterol.

Russel Brain says of the etiology of Schilder's disease "The early infantile examples have been attributed to a failure of development of the myelin sheaths, later cases to a failure to maintain their nutrition. This in turn has been ascribed to a defect of the oligodendrocytes (Greenfield) a disturbance of the power of the glial cells to regulate lipid metabolism (Scholz) and the presence of abnormal lipoids in the blood. (Bielschowsky and Henneberg)."

Thyroid therapy was tried on this patient, during her two months of hospitalisation, but was of no use.

Conclusion.—This case was diagnosed as Schilder's disease, a rare condition. In this case gargoylism was eliminated. The umbilical hernia and high blood cholesterol might suggest cretinism, but the growth was not retarded and the condition failed to respond to thyroid therapy.

I am of the opinion that gargoylism and cretinism have to be remembered in the differential diagnosis of Schilder's disease and this fact also needs to be stressed in the literature on the subject.

References:

1. Sheldon, Wilfrid—Diseases of Infancy and Childhood, 1946.
2. Frederic W. Price—A Text-book of Medicine, 1943.
3. Russel Brain and Strauss, E.B.—Recent Advances in Neurology, 1934.
4. Russel Brain W.—Diseases of the Nervous System, 1940.
5. Sarma, A. V. S.—Schilder's Disease, The "Antiseptic," July 1944.

Diethylstilbæstrol in Threatened Abortion

Karnaky had demonstrated in his earlier studies that the tolerance for diethylstilbæstrol in the pregnant woman was at least 1000 times that of the non-pregnant woman. In the present paper, he gives an account of his careful detailed observations on unselected patients with threatened abortion whom he treated with this drug. In the mild cases with only spotting and mild cramping for 4 to 12 hours he gave 100 mg. orally every 15 minutes until cramps, pain and spotting ceased. Then 25 mg. thrice a day are given for one week. A dose of 75 mg. is then given each morning up to the 8th month of pregnancy. If pain, cramps and bleeding recur, doses of 100 mg. are repeated every 15 minutes till symptoms are dispelled, then 25 mg. thrice a day and once at night are given for 15 days, then 50 mg. every morning for 2 weeks and then 25 mg. every morning till the 8th month. In moderately severe cases, (cramps and bleeding for a day) and in severe cases (cramps and bleeding persisting for 2 to 4 days) diethylstilbæstrol is given in large doses orally and also intramuscularly. During the last nine years, Karnaky administered this drug to 125 patients with threatened abortion. Diet and vitamins were also properly administered. Bed-rest was not given to any of these patients. Karnaky is of the opinion that bed-rest may be dispensed with, except perhaps in a few bad cases. Massive doses of diethylstilbæstrol caused no damage to mother or child. In 21 cases whose histories are reported at some length in this interesting paper, the foetal salvage rate was 75.6 per cent. Karnaky therefore dispels the fears that have been entertained by the medical profession regarding the effects of oestrogen therapy during pregnancy.—(*Arizona Med.*, 8, pp. 36-41, Jan. 1952).

Severe Polyneuritis following Gold Therapy for Rheumatoid Arthritis

The authors report the case of a patient who developed polyneuritis after receiving 100 mg. of 'myocrysin' every week for 9 weeks running. The symptoms consisted of tingling in the extremities with muscular weakness and loss of coordination. There were no changes observed in the cerebro-spinal fluid. Myocrysin was stopped but the condition became and remained worse for a month even after the withdrawal of myocrysin treatment. Gradual improvement followed thereafter and the recovery was complete only 4 months later.—(Doyle, J. B. and Cannon, E. F., *Ann. Intern. Med.*, 33, 1468-1472).

CYCLIC DIARRHOEA OF INFANTS*

A. V. S. SARMA, M.B., B.S., D.O.H. (Lond.), F.D.S. (Lond.),
Honorary Physician, Government Royapettah Hospital, Madras.

I WISH to record a few ideas relating to a form of diarrhoea which is periodic in occurrence, allied to cyclic vomiting.

Illustrative cases.—CASE 1.—A boy 8 months old; vegetarian middle class family; appears to be in ideal nutrition but for a slight scorbutic beading of ribs; had flexural eczema; mother suffers from migraine and asthma; maternal uncles are asthmatics; the child gets loose motions at intervals of about three weeks; the motion is pale, foul-smelling and semi-solid; each bout lasts for about a week.

CASE 2.—A girl of 8 months from a non-vegetarian middle class family; brought up on cow's milk; mother is asthmatic; the baby is a victim of periodic diarrhoea, occurring once in about three weeks.

CASE 3.—A girl of 2 years, from a vegetarian, middle class family; weaned at one year and given mixed diet; mother gets migraine and maternal grandfather is asthmatic; the child gets periodic diarrhoea and at least three bouts were carefully noted.

CASE 4.—A girl 1 year old, from a vegetarian middle class family; father subject to migraine; weaned at the 9th month; several attacks of diarrhoea periodic and more or less benign, were witnessed.

CASE 5.—A boy aged 2½ years, brother of No. 4; victim of diarrhoea as described before; two children in this family died of infantile biliary cirrhosis.

CASE 6.—A boy of 9 months, fed on breast milk with supplements of powdered milk; vegetarian, middle class family; father victim of migraine, and later developed diabetes mellitus; child having periodic diarrhoea and recovering from the same.

Aetiological factors.—The following points emerge from a close study of the above six and several other subsequent cases.

Predisposing factors:—There is probably an allergic basis in all. Here is an interesting example:—a girl developed infantile hepatic cirrhosis and recovered from the same, and the period taken for recovery was from the age of 1 year to the age of 5 years. The mother is asthmatic and subject to toxæmias of pregnancy; she is Rh positive, with Kahn and Wassermann tests negative. The father is subject to migraine. This child seen frequently during her 6th year is suffering from asthma or cyclic diarrhoea.

Clinical condition:—It was very difficult to differentiate the diarrhoea in question from others, except after closely observing the child for a fairly long time, when only it was possible to be sure of the diagnosis.

* Specially contributed to THE ANTISEPTIC.

The general condition is not much perturbed. Rarely the temperature rises to 100°F and with marked dehydration. The condition deteriorates with added infection.

DIAGNOSIS.—Diarrhoea is customarily classified as dietetic, infective and parenteral. Cases not conforming to these types demand special attention; and enquiry into such cases generally reveals that the family members suffer from a periodic syndrome of eczema-asthma-prurigo complex and that the child has been getting regular bouts of diarrhoea. Till the patient rallies round completely and is watched on similar subsequent occasions one cannot be positive about the diagnosis.

PROGNOSIS:—Periodic diarrhoea *per se* is rarely fatal. A few of the victims run on to hepatic cirrhosis and sometimes to a marasmic state simulating coeliac disease. Infections supervening, dehydration sets in, sometimes with fatal results.

PATHOLOGY:—In children, allergic and hypoadrenal elements probably form the basis. I am inclined to think that intolerance to fats and an insufficient supply of vitamins C and B factors may have also a bearing on this condition.

TREATMENT:—Rest in bed with quiet surroundings must be ensured. Fat is avoided but fat-soluble vitamins are allowed, as concentrates. Fluids are allowed, particularly fruit-juices.

Vitamin C seems to be specific. Apple diet, tea, buttermilk, and arrow-root *conjee* and albumin water are allowed.

From theoretical considerations, prevention appears to lie in dietary adjustment:—a low-fat diet with quality-proteins, an optimum of sugars and a liberal supply of vitamins, particularly the C and B factors.

References:

1. Sheldon, Wilfrid.—Diseases of Infancy and Childhood, 1946.
2. Pearson, W. J. and Wyllie, W. G.—Recent Advances in Diseases of Children, 1935.
3. Sarma, A. V. S.—Allergic Disorders, The "Antiseptic", October, 1949.

Important Observations on Hypertension

Osbaldeston and Stuart carried out careful observations and controlled studies on 25 normal healthy subjects and found that both the systolic and diastolic readings were uniform irrespective of the posture assumed by the patients (standing, sitting or lying) provided the readings were taken with the arm in the horizontal position. They also noted that in all persons whether in normal health, general illness or with hypertension, the position of the arm in relation to the body was of utmost importance. Usually the systolic B.P. is 8 mm. of Hg. and the diastolic B.P. 10 mm. of Hg. higher with the arm in a dependent position than in the horizontal position.—(*Canadian. Med. Assoc. Jour.*, 68, 65, 1951).

INFANTILE CONVULSIONS*

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CONVULSIONS or fits like epilepsy, consequent upon a remediable cause, occur in children who are generally below par in health and have an irritable and unstable nervous system.

CAUSES:—1. Digestive disturbances. 2. Irritation due to teething, worms, middle-ear disease, tight foreskin in boys. 3. Rickets. 4. Congenital syphilis. 5. Eruptive fevers, malaria, rigor in the adult manifest in children as a fit which, at the onset may be ignored; but fits recurrent or occurring during the course of an illness may point to an intracranial cause (congestion as in pertussis, venous thrombosis as in marasmus and gastro-enteritis). 6. Meningo-encephalitic causes; meningitis (various types), polio and other types of encephalitis, intracranial tumours (tuberculomata included) birth injuries and mental defects. Recurrent fits may herald true epilepsy. Diagnosis is important particularly in determining the cause. (Masturbation is not missed but promptly checked with advice to parents).

TREATMENT:—During convulsions:—A warm bath; chloral hydras (orally gr. $\frac{1}{4}$ to 1 for children under 3 months every 2 hours if swallowing is possible until fits cease; or per rectum twice the above dosage), chloroform anæsthesia and even lumbar puncture. An injection of Calcibronat (Sandoz) 1 c.c. per year of age up to 5 c.c. for a child of 6 years has always been found useful by me. Dial (Ciba) 0.25 to 0.5 c.c. or paraldehyde 1 to 4 c.c. intramuscularly may be needed. Both are however, painful injections.

After the convulsions have ceased, a lower dosage of chloral hydras is used for a fortnight. A thorough examination of the child should be followed by treatment directed towards removing the cause (e.g., worms, congenital syphilis, rickets, malaria, etc.).

Epilepsy diagnosed after careful observations, needs treatment with phenobarbitonum and bromides for a pretty long time. The inevitable dementia resulting in the disorder in a few cases, would need institutional care and treatment.

The Treatment of Manic Depressive Patients with Lumbar Procaine Block

Protopov and his coworkers treated 37 manic depressive patients by using procaine block of the lumbar sympathetic ganglia and plexuses. The dose administered was 40 to 120 c.c. of the 0.25 per cent solution of procaine and the number of treatments varied from 1 to 8 in each patient. This form of treatment was found to be definitely beneficial in 33 of 37 cases (89%); the psychosis was terminated in 12 cases, and in 21 cases it was greatly improved. Only in 4 had the lumbar block no therapeutic effect.—*Neuropat Psikiat*, 19, 6, 28-35, 1951.—*Eng. Abst.*

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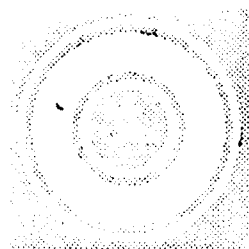
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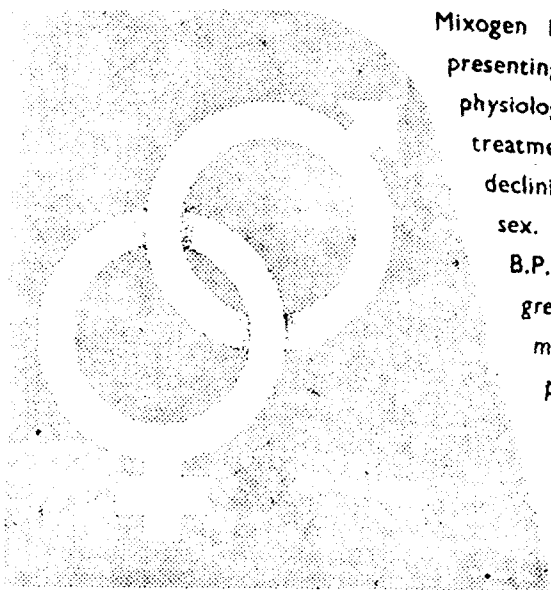
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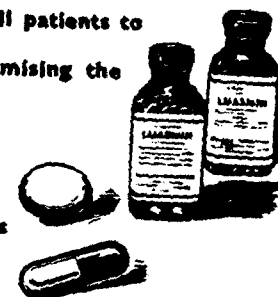
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SILICOSIS, ANTHRACOSIS AND PREDISPOSITION TO PULMONARY TUBERCULOSIS IN CEMENT INDUSTRY*

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THE role of industrial medicine in increasing the output in any industry is becoming more and more prominent, as there is a heavy demand for increased production to meet post-war reconstruction schemes. The efficiency of a factory depends upon the health and the social environments of its workers.

So far as the cement industry is concerned there are no occupational diseases. It is a well established fact that cement does not cause any occupational malady; still some people believe that respiratory affections in workers are due to the inhalation of cement dust. This paper is meant to dispel such wrong beliefs, and is based on authoritative statistics and on expert opinion. That cement dust or limestone does not cause silicosis or lead to pulmonary tuberculosis amongst the workers, will be evident from the following authentic quotations from text-books and journals:—

1. "Pneumoconiosis is non-tuberculous in origin and it may remain so throughout its course. It would appear that the determining factor is the presence of particles of silica. Silicates as in clay do not induce tuberculosis. Workers in free stone develop this disease. Limestone workers do not". (Price: *Text Book of the Practice of Medicine*, p. 1191).

2. "The reason that tuberculosis is rare in coal-miners may be that the finely divided coal has the power to adsorb tuberculin". (Beaumont.—*Medicine: Essentials for Practitioners and Students*, p. 167).

3. *Diseases in the cement industry.*—Some of the diseases to which workers in the cement industry are prone are discussed by Mr. Joseph Deforge in "*Le Revue des Matériaux de Construction*" for July 1948. The French Laws apparently recognised cutaneous lesions as the only class of occupational malady caused by the action of cement for which compensation could be awarded. These skin diseases include primary dermatitis and pyodermitis and cement-itch (eczematous secondary dermatitis). In the opinion of Mr. Deforge, there is practically no risk of silicosis in the manufacture of cement and lime. Silicosis is caused only by breathing air containing free silica in the form of a fine powder which more or less petrifies the pulmonary tissues. In the manufacture of artificial cement silica is hardly ever in an uncombined state.

In a report in the "*British Journal Physical Medicine*" on the occurrence of dermatitis in the asbestos cement industry,

* Specially contributed to THE ANTISEPTIC.

Mr. Hindley Smith states that this disease is prevalent among men handling cement or a mixture of cement and asbestos, especially when wet and that it is not caused by asbestos alone. Workers wearing rubber gloves are more susceptible, possibly because heat and perspiration are predisposing factors; by washing all cement from inside the gloves and by perforating the gloves in order to increase ventilation the deleterious effect was reduced." (Extract from "*Cement and Lime Manufacture*", p. 126, Nov. '48).

4. "The report on an enquiry into conditions of labour in the Cement Industry in India" by Mr. S. R. Deshpande, Member, Labour Investigation Committee, Government of India states that "from the replies to the Committee's questionnaire as also from personal enquiries made, it does not appear that workers in cement factories are subject to any occupational disease. Nor is there any evidence to show that the inhaling of cement dust leads to any abnormal incidence of affection of the lungs etc." This Committee has also reproduced an extract from Dr. P. Feldman's letter to them dated 11-10-1941 by the Sone Valley Portland Cement Co. which reads as follows:—

"Calcium salts are not considered very dangerous. The real enemies of the lungs are silica and certain mineral silicates. It is interesting to note that whereas "Fresh" dusts are very active and dangerous, "Old" dusts lose much of this quality. Biscoe and his collaborators (1939) have stated that freshly fractured surfaces of silica and some mineral silicates are in a highly reactive state and readily yield both alkali and soluble silica on contact with water. It is easy to imagine, that such qualities must be disturbing to the life of human tissues. The activity of freshly fractured crystals follows from the molecular structure ("lattice structure") of such crystals (Bragg). It appears that gypsum has a protective action in the production of silicosis which is chiefly due to agglutination of quartz and gypsum particles in the air. The heavy aggregates settle and thus reduce the quartz content of the air" (Haldane Gardener).

5. The following is an authentic and authoritative extract from a report by the Federal Service for Public Health in respect of a large cement factory (1927-'28).

"Cement is composed of lime and silicic acid—substances which are today used in the treatment of tuberculosis—calcium having the property of increasing phagocytosis and silicic acid helping to increase the growth of connective tissue which favours healing of tubercular foci. According to Pesenti cement dust is said to arrest the development of tuberculosis."

Statistics from our works.—Our cement factory which employs over 700 workers has been in operation for the last 10 years—

According to Beaumont, patients with pneumoconiosis generally give a history of having worked for some years—usually over 6. Though over 60% of our workers have put in more than 8 years of service, there has not been a single case of silicosis or anthracosis. So far we had 7 cases of pulmonary tuberculosis, of which one was from our general office, one from watch and ward, one from the civil engineering and one from the moulding departments. None of these had anything to do with cement. Further, in the case of the patient from the civil engineering department who was a cooly, his wife was ailing from pulmonary T.B. and it is probable he caught the infection from her. The remaining 3 cases were from the cement packing department with a service of less than 15 months. It is very likely that these persons had a latent infection even prior to their engagement and the disease must have flared up due to malnutrition and dusty atmosphere. We have not come across any case of silicosis or anthracosis or pulmonary tuberculosis in the crusher, coal mill, raw mill or cement mill departments. From the data collected from our sister works and our own, the following conclusions are justifiable:—The incidence of silicosis was *nil* in our whole organisation. But there were 64 cases of pulmonary tuberculosis in the last 10 years, the details of which are as under:—

Power House	.. 1	Workshop	.. 8
Crusher	.. nil	Laboratory	.. 3
Cement Mill	.. 1	Medical and Sanitation	.. 4
Raw Mill	.. nil	Civil Engineering	.. 18
Packing Dept.	.. 6	General Offices	.. 5
Kiln	.. 3	Watch and Ward	.. 12
Electrical	.. 3	Total	.. 64

Out of 18,700 employees, only 64 had T.B. This works out to 0.342% and shows that the prevalence of tuberculosis among our workers is not different to what one finds in the general population and if anything it is very much less.

Conclusions.—1. Limestone or cement dust does not contain free silica which is dangerous but contains silicates which are not deleterious. Naturally there is no likelihood of silicosis developing in workers in limestone or cement factories.

2. Cement dust does not cause tuberculosis but can, like any other dust produce a flare-up in a latent tubercular focus. For that matter, any dust will favour the development of tuberculosis as well as other infections in susceptible individuals.

3. Silica exists in cement as a complex silicate of calcium which is a stable compound and cannot cause silicosis. Hence the chances of development of pulmonary tuberculosis are very remote.

On the other hand, just as in anthracosis, the finely divided coal adsorbs the tuberculin and so the calcium silicate content of cement may exert a beneficial influence in arresting the development of pulmonary tuberculosis.

ULTRAVIOLET THERAPY*

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St. Raphael's Villa, Kotagiri.

History and development.—Light has played a dominant part in the production and evolution of various forms of life, both in the animal and vegetable kingdoms from the dawn of history. Like so many other essentials its presence has been accepted almost as a matter of course.

In remote times, however, sun worshippers existed and there are records of sun treatment being employed, although the conception of the beneficial effects of the sun was erroneous. It is a well known fact that the Egyptians of Biblical times used sun's rays in the treatment of diseases. Later, the Greeks and Romans took advantage of their beneficial therapeutic effects and used them for many ailments. In fact the therapeutic use of the sun is almost as old as the art of medicine itself. Hippocrates, the first great name in medical science, as far back as the fifth century B.C. had recommended sun baths; whilst in Roman history, Cicero in the first century B.C. and Pliny in the second century A.D. both spoke of "sunning places" upon the roofs and gardens.

The evolution of modern ideas on radiation goes back to the time of Sir Isaac Newton, who in the year 1666 discovered the spectrum of visible light.

It was not until comparatively recent years however, that serious scientific study was directed to the biological effects of light and the precise rays of the spectrum involved in producing these therapeutic effects.

In 1893, Professor Neils Finsen, of Copenhagen, demonstrated that sun-burn was a reaction of the skin to the actinic rays of the sun and these rays belonged to the ultraviolet region of the spectrum; that they had very little penetrative power on the skin and that the penetration of vascular tissues was very small.

On May 1st, 1900, the first Finsen-light Department in England was opened at the London Hospital, the first Finsen Lamp being presented by the late Queen Alexandra, then Princess of Wales.

In 1903 Dr. Rollier acting on the advice of Dr. Bernard, experimented with sun-cure at Leysin in the Vaudois Alps. Here he developed "Heliotherapy" and placed it on a sound footing; and the success he achieved in certain forms of tuberculosis is now known throughout the world. Dr. Kurt Huldshinsky, Medical Officer of the Oskar-Helene Home for crippled children in Berlin in 1919 was the first to describe and demonstrate the effect of ultraviolet rays on the bone lesions in rickets, and his results were studied and reproduced clinically on the continent, in America and later in England.

It is said that there is nothing new under the sun, and indeed this is particularly true of sun light therapy. It must be acknowledged, however, that there has recently been an extraordinary awakening of interest in the use of light in the treatment of disease. As in the case of X-rays, time and patient enquiry are needed before its exact scope in therapeutics can be defined, but abundant evidence of its utility in many fields of medicine and surgery is available to warrant its use in modern practice.

What influence a further knowledge of cosmic rays may exert on curative medicine is a problem for the future.

The nature and physical properties of radiation.—If a sun-beam is allowed to fall upon a glass prism, the ray of white light is, as is well known, split up into the different colours of varying wave length of which it is composed. These are visible to the human eye as the colours of the rainbow (red, orange, yellow, green, blue, indigo-blue and violet). This display of colours produced by the splitting up of the sun's ray by means of a prism, or, in other words, the ray resolved into its constituent parts, the bands of distinct colours separated from one another or the varying wave lengths, is called the spectrum of the source of light, in which each tone of colour corresponds to a definite wave length. These wave lengths are exceedingly small, yet they can be measured with a considerable degree of accuracy by the physical means at our disposal. The wave lengths of visible light, range from about 0.4 to 0.8, (1/1000 of a millimeter-micron 1μ). (Millimicron or millionth of a millimeter $1 \mu \mu$).

If a spectrum is produced through a quartz instead of a glass prism and thrown on a photographic plate instead of on a simple white surface, while the violet end of the colour spectrum produced by the glass prism be marked in some way, we find in developing the plate that with the quartz prism the spectrum extends considerably beyond the last visible violet colour. At the opposite end of the spectrum which shades off into the dark red we find the same, with the difference that at the red end the further extension of rays cannot be demonstrated by the photographic plate, which is insensitive to red, but only by means of delicate thermometers. In this way it can be proved that both beyond the violet and beyond the red there are rays which cannot be perceived by the human eye. They are called the ultraviolet and infra-red rays. The ultraviolet rays are shorter than the last visible violet and the infra-red rays are longer than the last visible red. It cannot be doubted that these vibrations occur in the so-called universal ether—a hypothesis which cannot be ignored—as the air cannot possibly undergo such infinitely rapid movements and velocities. The ether must be regarded as pervading the atoms or molecules of all bodies, even of the air as the air pervades a mass of rough stones. Without ether the passage of sunlight through the void, for instance, would be inexplicable; similarly the passage of

* Specially contributed to THE ANTISEPTIC.

rays through glass, which is quite impermeable to all gases, or the passage of rays through the vacuum of a filament lamp.

Light waves are the result of vibrations of this all-pervading ether, in the same way as all sounds, for instance, are the result of regular vibrations of the air. While however, air waves proceed at the rate of only 300 meters per second, the fine ether waves travel at a velocity of 300,000 kilometers per second. This extreme velocity (which it may be noted, is surpassed by nothing) is the speed of all the electro-magnetic waves or vibrations of that great unknown which the scientists have called ether, whether they be long or short, or whether they be heat, light, radio, or röntgen waves. A wave of exactly 300,000 kilometers in length would occupy the whole distance of its projection per second i.e., 300,000 kilometers. There would therefore, be one wave or vibration per second. With 50 waves per second i.e., 50 waves in 300,000 kilometers each wave would be 6000 km. long. This is the case with the normal 50 period alternating current used in electric circuits. With greater periods of vibration figures, smaller waves are obtained. Thus with 100,000 periods and more per second the small wave lengths from 3 km. down to a few hundred meters, employed in radio-telegraphy are obtained. Then come the so-called Hertzian waves with increasing periodicity per second until a length of a few millimeters is reached.

The eye responds only to waves between 750 and 400 μ viz., from the darkest red at one end to the darkest violet at the other. Below 400 μ the invisible ultraviolet waves begin and it has been found possible to demonstrate down to 100 μ . The Millikan rays lie between 136 μ and 100 μ . Distinct evidence of the presence of still shorter waves is finally obtained in the case of röntgen rays, which, with their wave length of about .02 μ manifest themselves in a manner now well-known.

The peculiar fact remains that the long electric waves proper i.e. those used in wireless telegraphy, pass through nearly all media, through thick walls etc. almost without loss of power, that even long heat waves will pass through some substances such as vulcanite, paraffin etc. in thin layers, that the light waves which follow and especially the ultra-violet are completely absorbed by all media not optically transparent and that finally the very short röntgen rays again easily pass through the softer opaque bodies.

Medium ultraviolet and short-waved ultraviolet, particularly the latter are chemically very active. The effect can be imagined in this way, that the exceedingly rapid short waves, as soon as they have reached a certain velocity are able to shatter the structure of many chemical bodies to such an extent that it leads to the destruction of the molecules. We find this phenomenon with sensitive silver films on photographic plates and paper, the loose chemical composition of which is weakened or completely

broken up by the comparatively weak effect of visible light, particularly its blue-violet portion. From the white chloride or bromide of silver the silver is deposited as a black dust upon the plate under the influence of ordinary light, possibly with the assistance of a developer. While the infra-red or heat rays possess a fairly strong penetrating power on account of their comparatively long waves for example, through glass, through heavy atmosphere, through thin materials, (the setting sun appears, as is well known as a red ball because the blue is absorbed by the vapour on the horizon), so the penetrating power of light becomes less and less, as the wave lengths become smaller.

The common sources of ultraviolet light for therapeutic purposes are:—(a) The mercury vapour arc; (b) the carbon arc; (c) the tungsten arc; and (d) variations and combinations of (a) and (b) and the use of other metals.

The skin in ultraviolet therapy.—The skin is of great importance in heliotherapy and actinotherapy. Definite and complicated processes actually take place in the skin and many and diverse are the effects produced in the body indirectly by the action of the rays on the skin. As is well known, the skin is composed of two parts, the epidermis or cuticle and the dermis or cutis vera. The epidermis is a thick stratified epithelium. The deep layers are composed of protoplasmic cells and form the rete mucosum or malpighian layer; the surface layers are hard and horny; this horny layer is the thickest part of the epidermis. It is in the cells of the malpighian layer that pigment granules are deposited in the coloured races. The dermis is composed of fibrous tissue which becomes looser and more reticular in its deeper part, where it passes by insensible degrees into the areolar and adipose tissue of the subcutaneous region. It is interesting to note that the normal individual has about 15 sq. feet of skin and this contains more than 1/3 of the blood contained in the entire human body. This fact makes it possible to exercise through the skin a very great influence upon the distribution of the blood in the deeper structures and internal organs. The erythema which results from exposure to ultraviolet radiation is a most striking effect. After a well-defined latent period which varies from 4 to 8 hours an erythema appears. The pigmentation of the skin is due to melanin, which apparently acts as a screen, preventing excessive heating of the living tissues and the blood in the skin by an excess of visible rays.

1. *Mechanism of action of sub-erythematous doses of U.V.R.:—*The ultraviolet rays possess very powerful physical energy. When the rays fall on the skin there occurs a transformation of this energy and stimulation of the function of the skin. The skin as shown by recent work, possesses important endocrine functions. It is not an inert covering as it was considered till a short time ago. It is an important endocrine organ constituted by a combination of nervous and glandular elements. Certain cells of the skin, those of the

stratum germinativum, the basal layer of the epidermis, secrete hormones which play an important role in the metabolism of the body. Among other metabolic functions, the skin produces by synthesis, vitamin D which acts on the all-important calcium metabolism. The enzymes produced by the skin help in the metabolism, principally of carbohydrates and of fat. The hormones that it produces act in conjunction with the other endocrine organs of the body in the regulation of the body's chemistry. We know that the endocrines are closely inter-related by chemical and nervous messengers.

Normally they are in perfect equilibrium, by which the functions of body and mind are integrated. When this equilibrium is disturbed in disease, action on one endocrine can help to re-establish it up to a certain point. Through ultraviolet irradiation we act on one important endocrine, the organ through which man receives the environmental stimuli which govern his adaptation. Besides its endocrine functions the skin possesses nervous vegetative functions. The skin may in fact be considered as a large surface of nervous vegetative tissue. It possesses nervous terminations, and the ultraviolet rays acting on these terminations initiate reflexes, the effects of which are deep and involve the functions of the endocrine organs and of the nervous system. Thus, the simple operation of the irradiating the surface of the body with small doses of ultraviolet sets up an important chain of events in the biochemistry of the body and in the functions of the body and thus in the fight against disease. The action of small sub-erythematous doses is essentially biological, because it repeats the normal stimulus which the human body receives from natural sunlight.

2. *Mechanism of action of erythematous doses*:—When a patient is irradiated for a longer time and at a shorter distance erythema is provoked. The chain of events leading to this erythema differs from those following small sub-erythematous doses.

Erythema indicates that there has been a modification of the skin-proteins, often a destruction of these proteins and formation of protein-split products. These products, foreign proteins, are absorbed by the blood. Against this absorption of foreign proteins the body defends itself. The defence takes the form of a stimulation of the regulators of body metabolism, the endocrines and the vegetative nervous system, stimulation, in other words of the defensive processes of the body. The regulators of metabolism and of body defence thus stimulated react not only on the proteins absorbed by the blood, but also on the other morbid factors which threaten to disturb the biological equilibrium of the organism. Thus strong erythematous doses of ultraviolet act through the mechanism of protein-shock, stimulation of the metabolic and defensive processes of the body. Small erythematous doses act through the mechanism of biological stimulation of the metabolic processes of the body.

It will be interesting to see how vitamin D is produced in the fish, particularly the cod. The sequence is as follows:—The diatoms (minute vegetable life) on the surface of the sea elaborate the vitamins from the sunlight. These substances probably cause the wonderful phosphorescence that can often be seen on the sea during very dark nights. The diatoms are the food of animal plankton eaten by the smaller fish, which in turn constitute the food of the great cod. In this way the substances produced by the minute forms of ocean-life are passed on from small to larger fish until they reach the cod, which has the peculiar ability of storing this material in its liver. The cod's liver becomes in fact a reservoir of the material produced when the human skin is exposed to ultraviolet rays.

Constitutional inadequacies.—The great object of modern practical medicine and thus the greatest task of the general practitioner is prevention. Prevention of disease which was until a few years ago exclusively in the hands of the Public Health authorities, although remaining partly with that organization, is now increasingly becoming the work of the physician, principally of the general practitioner. The whole work on modern endocrinology and constitutional medicine has culminated in this changed point of view.

Real preventive medicine consists in the correction of constitutional inadequacies during childhood. These insufficiencies centre in minor dysfunctions of the endocrines, and the physician can find out whether there is constitutional minor hypo- or hyper-thyroidism, hypo- or hyper-pituitarism, deficient evolution of the thymus, hypogonadism, disturbance in calcium metabolism and so on. He can determine the constitutional type or bio-type of the small or older children or even of the adolescent and thus advise as to prevention of various diseases. One of the most important constitutional inadequacies in which the practitioner can intervene with great success is the so-called lymphatic constitution, which is probably under the influence of disturbances in thyroid, adrenal, and thymus internal secretion. These children show very much developed lymphatic glands in all parts of the body; in fact of the whole lymphatic system, in particular that of the pharynx (adenoids and tonsils). It is unfortunately a reflex today to consider the tonsils of these children as the source of the condition, whereas the hypertrophy of the tonsils is only a manifestation of the general lymphatic inadequacy and hypertrophy. Tonsils must be taken out only if they are really septic, but unhappily most of the tonsils removed are absolutely innocent. It is much more rational in such cases of lymphatic constitution to start with ultraviolet treatment. Very frequently such treatment will enable the physician to avoid unnecessary tonsillectomy. It is not without harm for the future well-being of the child that healthy tonsils are removed, because tonsils are among the most important immunity organs of the body.

out in clinics and hospitals, there would be a considerable decrease in infant mortality from pneumonia, diarrhoea and convulsions.

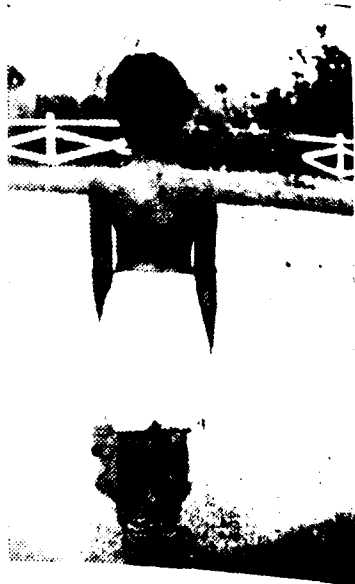
The Bermondsey municipality, a suburb of London insists on every infant going through a course of ultraviolet rays. Knock would thereby be detected.

Even in cases of injury, how radiation plays an important part

is shown by the following case treated in this clinic, of fracture dislocation of the lower dorsal vertebræ as a result of injury simulating kypho-scoliosis taken before and after treatment.



Before treatment.



After treatment.

(See photographs).

A Muslim girl, 7 years of age; weight 26 lbs; poorly nourished anæmic, partial paralysis of both legs—A radiograph was not taken owing to the financial position of the parents. No orthopaedic treatment was attempted.

The accident happened in 1935 when the child was being carried down the stairs; the person carrying the child fell and the back of the child struck a baluster. The bending of the spine towards the right side had compressed the ribs causing a large protuberance of the right side of the chest in front.

TREATMENT:—Four courses, each of 12 general irradiations of the body, 3 exposures weekly and counter-extension on an inclined plane. Massage and pot. iodide ionization over the seat of the injury. The child had to be discharged when both sides of the chest were practically normal, but for a slight prominence over the seat of the injury on the spine; the child was able to walk short distances without any discomfort except for a slight drag owing to stiffness of the spine. The outstanding result was produced mainly by ultraviolet rays by improving the general physical condition of the child.

Many skin diseases react well to ultraviolet rays. The treatment of erysipelas, particularly the early cases, by ultraviolet appears to give better results than other methods in use.

One of the cases of intractable skin disease treated in this clinic was that of an Indian priest; this condition lasted for some years in spite of drastic treatment including burning with strong acids prior to coming here; books do not describe it, the case report was sent to the *British Journal of Physical Medicine* with a view to finding out the correct diagnosis and a better line of treatment if any. It appeared in the issue of that journal for December 1937, page 184. Excerpts therefrom are given below:—

“The following interesting case report has been sent by.....

A tentative diagnosis of scleroderma was made and the treatment outlined below was instituted with the result that the condition ultimately cleared up. Suggestions or criticism concerning diagnosis and treatment of the case are invited.....An Indian priest, age 38, diagnosis (provisional) scleroderma.....duration—5 years. Complained of severe itching with occasional bleeding after scratching, the irritation being so severe at times that it would keep him awake for hours at nights.

“May 3rd, 1937. An irregular patch 3½ inches by 3 inches on the inner and middle aspect of the right thigh about ¼ centimetre raised from the surrounding skin, indurated, inelastic, highly pigmented corrugated and pachydermoid; no scraping was taken. For want of a better diagnosis, it was labelled-scleroderma; physical condition good. A general examination revealed nothing abnormal.

TREATMENT:—Mostly ultraviolet radiation at a distance of 12 inches with 30 minutes' exposure at each sitting together with chlorine and zinc ionization.”

Ulcers.—The problem in healing is to dispose of infection, to regenerate the damaged epithelium and to correct defective circulation and nutrition. Local actinotherapy has a powerful action in all these respects.

One of the cases of an indolent ulcer and eczema, treated in this clinic was that of an English lady, wife of a District Superintendent of Police. She had elephantiasis of one leg and the ulcer developed over the skin.

She was treated for a long time with stimulating lotions, ointments etc. including certain treatment carried out in the Hospital for the treatment of Tropical Diseases in Calcutta.

TREATMENT:—The entire infected area cleared up in 2 to 3 weeks after treatment with ultraviolet rays to stimulate the ulcer and a few treatments with an Inducto-therm cable to increase the circulation.

The following appreciation was received from her husband:—
“You can imagine how grateful we are for all that you have done for

my wife, for it has relieved her of much suffering and anxiety which she has patiently borne for 10 years."

The indications for local irradiation are numerous, particularly in ear, nose and throat work.

Ultraviolet irradiation is of great value in many diseases of and injuries to bones and joints. It is almost a specific remedy in rickets and surgical tuberculosis. When tuberculosis has established itself, actinotherapy becomes the physician's first weapon. Tubercular affections of the bones, joints, skin, glands, peritoneum and the genito-urinary system all respond very favourably to irradiation and the results have been so good that this should be the treatment of choice.

The relationship of ultra-violet rays to the calcium balance of the body is an established fact of science and the practical application of the knowledge has fully confirmed the knowledge acquired by physiological investigation. It is incontestable that where it is necessary to ensure an optimum state of calcium metabolism, Vitamin D must be present in sufficient quantity in the body. It should be further mentioned that there is a very definite possibility of a deficiency of vitamin D, existing in the diet and although no definite symptoms may arise from this in the adult, when an extra demand is made upon the calcium balance of the body, this deficiency may manifest itself in a serious manner. A great demand upon the calcium reserves occurs in every case of fracture of bone.

Respiratory diseases.—Asthma and allergic conditions:—Asthma is an allergic condition and allergy has a twofold basis. An individual is allergic, first because he has an excess of antibodies to one or more antigens in his organism, and secondly because he has a special liability of the humors or more precisely of the colloids (the colloido-classic diathesis). The fact that he has an excess of anti-bodies in the blood and tissues indicates a defect of immunity organs, and these are known to be under the influence of the endocrines and vegetative nervous system. The fact that he has a special liability of his colloids indicates a defect in the vegetative nervous system and endocrines, because these two systems maintain the normal condition of the colloids. If to that, be added the fact that certain organs (the so called shock-organs) by reason of the special inferiority are predisposed to the special localization of allergic phenomena, the contemporary conception of allergy will be clearly understood.

Ultraviolet rays alter the basic hydrogen-ion-concentration of the blood, rendering it more alkaline; hence its value in many conditions accompanied by increased acidity of the blood; e.g., diabetes, gout, rheumatism, tetany etc. In diabetes, ultraviolet rays are useful in reducing the blood sugar. Obesity is a condition which frequently reacts in a surprising manner to actinotherapy.

Colitis:—Owing to the fact that a large number of cases of colitis are associated with, if not due to endocrine disturbances, the basic treatment is by ultraviolet rays. They are extremely useful in that almost hopeless type of all colitis conditions viz., the tuberculous type.

Ultraviolet rays deeply influence carbohydrate, fat, protein and mineral metabolism and also activate vitamins in the body, through their action upon the blood and on the central nervous system. They tend to bring the disordered processes of metabolism back to a normal plane. They assist those functions which are depressed; where nutrition is deficient, absorption becomes increased; where elimination is sluggish, oxidation is stimulated. The organism reacts according to its particular needs.

How true was the remark of an Italian lady doctor, one of my patients, when told that it was not necessary to determine exactly which of the endocrine glands are not functioning properly as general ultraviolet irradiation regulates the functions of all the glands. In hyper-secretion, it reduces and in hypo-secretion it raises the secretion. "Oh! doctor, this treatment covers the ignorance of doctors". Out of the many hundreds of cases treated in this clinic with general body irradiation every one of them increased in weight from one to three pounds weekly: one of my spectacular cases was of a Church of England minister who increased by three pounds weekly for six weeks. Another lady doctor who was treated for rheumatism and who was disproportionately stout, lost a few pounds after treatment and with the further dieting which was recommended, she was reduced by two stones in 2 years.

The action of light on the blood components.—Under ultraviolet rays the red blood cells slightly increase in number and the hæmoglobin content increases after continued treatment. From the practical point of view, it is interesting to note that very often the worse the case of anæmia, the more it seems to respond to ultraviolet rays. Aschenheim and Mayer's observations and Huldshinsky's concur on this point.

The bactericidal power of the blood.—One of the most important properties of ultraviolet rays is to increase the bactericidal power of the blood, in other words, to increase the resistance of the individual against disease. The remarkable correlation between the increase in the bactericidal power of the blood and the minimal erythema dose discovered by Leonard Hill, Colebrook and Eidinow is well known. These observers found that if the bactericidal power of the blood be high, no effect is produced (e.g. the effect of ultraviolet rays on a normal hæmoglobin percentage); but if the bactericidal power be low, a very definite rise occurs after an effective (erythema) dose (an overdose will lower the bactericidal power—an important point to remember in treating all acute diseases).

The calcium and phosphorus content.—The calcium content of normal serum should be about 10 mg. per 100 c.c. and of inorganic phosphorus 6 mg. per 100 c.c. Ultraviolet rays acting on the skin produce vitamin D from the ergosterol or "pro-vitamin". This vitamin D by influencing the balance of calcium and phosphorus absorption in the small intestine affects the levels of these elements in the blood stream and thereby the whole calcium and phosphorus metabolism. Calcium is of great importance to the body. The calcium ion appears to diminish the permeability of the blood and lymph vessels and of the cell membranes in the tissues. In this manner the calcium salts are believed to reduce secretions, relieve chilblains and erythematous skin rashes and to retard inflammatory processes. By its influence on calcium absorption, ultraviolet ray are of special value in many conditions *e.g.*, all conditions of sympathetic or para-sympathetic, inequilibrium and those associated with anaphylactic phenomena, including hay fever, asthma, urticaria, serum rashes, angio-neurotic oedema and hyperæsthetic rhinitis are greatly benefited. The calcium salts in the blood and tissues are essential for the action of many ferments.

Actinotherapy in relation to calcium-phosphorus therapy.—The element of calcium, which is one of the most important, exists to the extent of 0.0105 per cent. in the tissue fluids and is therefore, a vital constituent of every living cell in the body. Dealing with the question of diet it may be said that the foodstuffs that give an excess of alkaline end-products of metabolism which are the most important in preventing an acidosis are those which are rich in vitamin D. Impaired calcium metabolism is often the cause of susceptibility to the common cold. Calcium metabolism has received a great deal of attention in recent researches, and out of the chain of endocrine glands a certain number, such as the parathyroid, supra-renal and the anterior part of the pituitary, act as calcium builders and preside over the formation of bones and teeth, and have an action on the blood and other tissues. Laboratory and clinical experience goes to show that mere feeding with ample amounts of a calcium-phosphorus diet, does not by itself remedy the deficiency. The evidence tends to show that deficiency of both calcium and phosphorus in the blood is the result of an inability to retain and metabolise these elements rather than of a shortage in the diet.

The action of light on bacteria.—While light in general is favourable to the growth of plant life, the opposite is true as regards bacteria. All known pathogenic bacteria are killed by light and the same is true of pathogenic protozoa. In general, the vegetative forms are most sensitive to light and are easily killed; but in some species, the spores are most susceptible to the destructive influence of the light rays. It is generally agreed that the shorter wave length region of the ultraviolet is the more powerfully bactericidal.

The analgesic effects.—Dr. Bernard, remarking on the connection between therapy and analgesis, states "another clinical observation which forces itself on every heliotherapist is the remarkable analgesic effect of the sun's rays, which has as yet received no physiological explanation. It is possible that the alleviation of pain may be assisted by the action of the actinic rays on the end organs of the sensory nerves.

General effects on the skin.—According to the esophylaxian theory (propounded by Professor Hoffman of Bonn and Prof. Bloch of Zurich) the human skin possesses an introversive protective function (esophylaxis) of forming anti-toxins. Irradiation acts on the upper surface of the skin, the circulation and metabolism; the action is transmitted to the underlying forces of the body and these act on diseased foci. Elderer has shown that ultraviolet rays independently of the erythema of the skin, increase the alkalinity of the blood, decrease the acid products of metabolism and produce a change in the blood proteins, while at the same time there is a stimulation of the general metabolism, as shown by an increase in nitrogen excretion.

Some possible dangers of ultraviolet therapy.—1. Dermatitis and burns. 2. Conjunctivitis. 3. Malaise—"light sensitive cases." 4. Diminution of the hæmobactericidal power of the blood if the optimum dose is exceeded. 5. Treatment of certain cases or conditions *e.g.*, acute infective and pyrexial cases. 6. During menstruation. It has been observed that women subjected to ultraviolet radiation during the menstrual period usually complain of increased malaise and lassitude whereas before the periods they had experienced the usual tonic effect from the rays. It is therefore the safest thing in practice to stop treatment two days before the period and resume it two days after.

The following is a summary of the established effects of ultraviolet rays according to the authorities cited alongside:—

*"(a) Direct effect on the skin:—*Erythema some hours after irradiation with dilatation of the superficial blood vessels (not usually observed in infants).

Pigmentation (after a series of increasing exposures). Increased "esophylaxis"—anti-body-forming function of the skin—Hoffman, Bloch.

Stimulation of the skin functions (transpiration, heat regulation, resistance to infection).

*(b) Effects on the blood through the skin:—*Increased content of calcium, phosphorus, iron and iodine (Sttenbock, Russel).

Increase in the bactericidal power. (Hill; Eidinow).

Increase in hæmoglobin and red blood corpuscles. (Bardenheuer; Lorand).

Lymphocytosis and leucocytosis (Rollier ; Sampson).

Reduction of excessive blood pressure. (Hasselbalch ; Jacobsen ; Bach).

(c) *General effects on the body*:—Increased metabolism shown in improved appetite and sleep, increased assimilation and diuresis (Konigsfeld ; Kestner ; Elderer).

Marked mental stimulation, through action on the central nervous system (Gouvain).

Reduction of pain through analgesic effect on the peripheral nervous system (Russel ; Bernhard).

Deepening and slowing of respiration, with increased expiration of carbon dioxide (Hasselbalch ; Peemoller).

In conclusion, we may say that in ultraviolet radiation we have an excellent roborant, particularly for such conditions as convalescence, overwork, and nervous exhaustion ; and also an invaluable adjuvant for other drugs and therapeutic methods, so that "the practitioner is justified in using or testing it in the treatment of the most varied diseases". (Furnis). According to a technical review there is growing use for ultraviolet rays. Because ultraviolet rays destroy bacteria they have been harnessed to a variety of medical purposes in addition to direct curative application in disease. They are being used to sterilise operating theatres, hospital wards and doctor's consulting rooms. Air-conditioning plant in office blocks and flats are improved by passing air through chambers containing ultraviolet lamps. Another use is as anti-bacterial agent in the bottling and packing of pharmaceutical products which must be sterile when sealed. In Germany it has been used for sterilising drinking water in place of chlorine thus obviating the unpleasant smell and taste of the latter.

In some American Hospitals patients have been operated under ultraviolet lamps, especially abdominal cases and it was found that these experimental cases healed and attained the normal strength and well-being, more quickly than those operated in the ordinary way.

Habitual Premature Labour

The authors studied closely the histories and courses of pregnancy in 7 women who had repeated premature deliveries and found to have a gross deficiency of oestrogen. Subsequent pregnancy with diethylstilboestrol in doses varying from 5 to 50 mg daily, the amount being determined by titrations of hormones excreted, blood pressure and weight curves. The duration of pregnancy was prolonged in comparison with previous pregnancies. All the infants were born alive and were normally developed. —(Eves. H., and Bourgarel, R., *Gynec. et Obst.*, 3, 233, 1951)

STATUS ASTHMATICUS*

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THIS is a condition with which every general medical practitioner should be familiar. Clark described "*Status Asthmaticus*" as a period of intense dyspnoea which lasted several hours and was caused by an out-pouring of mucus in the bronchioles with a diminution in lung capacity and with little or no lung-remission. Death may occur in this condition, unless properly treated. The patient appears critically ill with a severe dyspnoea of a wheezy nature. He assumes an upright posture. He is cold and clammy. Cyanosis may develop. The temperature may be normal or elevated. Unconsciousness may develop in some cases.

Physical signs.—Inspection shows the patient in an upright position with a prolonged expiration ; percussion may reveal a hyper-resonant note in the upper half and a dullness in the lower half. On auscultation, expiration is prolonged and one hears sibilant and sonorous rhonchi all over and bubbling rales at the bases. The pulse is usually rapid and may be irregular.

ETIOLOGY.—The same etiological factors as are found in bronchial asthma are present also in this condition. The majority of these patients will be usually found to have had over-medication with insufficient fluid and food intakes.

Treatment for status asthmaticus:—The first thing to do is to reassure the patients that the attack can be controlled. They should be kept in a most comfortable position in a well ventilated room. These patients do not respond to adrenaline. They are generally adrenaline-fast. A dose of 0.1 c.c. (1 in 1000) adrenaline dissolved in about 20 c.c. of normal saline given very slowly, intravenously has produced good result in some cases. To combat dehydration due to ill-nourishment and inadequate fluid intake, a 5% solution of glucose should be given every 6 hours and the total quantity administered should be not less than 2 to 3 litres in 24 hours. Aminophyllin has received widespread acceptance as a bronchodilator in the treatment of both bronchial and cardiac asthmas. As the drug causes gastro-intestinal irritation, oral administration is not advisable even as enteric-coated tablets. The method of administration *par excellence* is by the intravenous route. It should however, be given *very very slowly*, as it is liable to produce coronary dilatation ; sudden death has also been reported in a few cases.

It is always advisable to start with a small dose of 0.25 gram initially and afterwards, 0.5 gram may be given dissolved in 1000 c.c. of glucose solution during a period of 24 hours, daily for 3 days.

* Specially contributed to THE ANTISEPTIC.

The idea is to keep the bronchial musculature relaxed by the continuous administration of aminophyllin. Oxygen by the BLB mask is a valuable adjunct. Caffeine et-sodium benzoate (7½ grains) subcutaneously every 4 hours has been found useful. For liquefying bronchial secretions, sodium iodide (1 gram) may be given I.V. added to a liter of 5% glucose by the drip method or potassium iodide 30 mins., 3 times daily may be given by the mouth. For sedative effect, chloral hydras or bromides or barbiturates may be given. On no account should morphia or similar drugs be used.

Summary of treatment.—(1) The patient should be kept in the most comfortable position in an airy room. (2) Fluids should be given: (a) by mouth as fruit juice and soda; and (b) by I.V. route as 5% glucose solution. (3) Bronchial dilatation is achieved by aminophyllin I.V. and caffeine et-sodium benzoate s.c. (4) For expectorant effect, sodium iodide I.V. or potassium iodide by mouth may be given. (5) For sedative effect, chloral hydras or bromides or small doses of barbiturate may be given.

Cardiac Oedema

The peripheral oedema of congestive heart failure regardless of the specific type of cardiac disease is indicative that the chambers of the right side of the heart have been unable to accept and expel the venous blood brought to them. Most commonly the cause of the oedema is pre-existing failure of the left ventricle, but it may be produced by isolated failure of the right ventricle, precipitated by disease of the pulmonary valves or pulmonary parenchymal and vascular disease which has led to pulmonary hypertension. Inflow obstruction such as that seen with chronic constrictive pericarditis is an additional cardiac cause of oedema.

Classical cardiac oedema is soft and painless. It first appears above the shoe tops at the end of the day and recedes by morning. As the cardiac disability increases the oedema slowly increases in amount and fails to disappear with recumbency until it involves the entire lower extremities, genitalia, sacrum and lower part of the abdominal wall. It usually is associated with dyspnoea and orthopnoea, which existed prior to the onset of the oedema. The oedema can involve any part of the body but its location is the most dependent parts of the body. Oedema in recumbent patients should be looked for, over the sacrum because of the dependency of this area.

Characteristically, too, with early cardiac oedema, diuresis can be produced by restriction of the ingestion of sodium, and by digitalization and the administration of mercurial diuretics. "Infact, I know of no more gratifying therapeutic response than that made by the cardiac patient with oedema, which has not become intractable", said Dr. W. Anderson, M.D., of the Division of Medicine of the Mayo Clinic.—(*Proc. Mayo Clinic*, 2-1-52).

MANAGEMENT OF A CASE OF COMPOUND PRESENTATION

(Both Arms Prolapsed)

S. N. BHATTACHARYYA, M.B.,

Medical Officer, Raj Hospital, Gidhaur, (Bihar).

A FEMALE, Mrs. M.M., aged 35 years, Hindu, of village Sono, some 8 miles south of Gidhaur came to the hospital on 9-11-'51.

GENERAL CONDITION:—A patient of average build and height; in agony with anxious look, a swollen abdomen with tonic contractions and both hands of baby protruding out of vulva having P/R = 140/30 p.m. V/T = mod. and regular.

PAST HISTORY:—She had given birth to 6 children all normal and one abortion at 4 or 5 months of pregnancy. Last menstruation —9 months ago.

PRESENT HISTORY:—Patient said labour pain started 5 days ago and 2 days back bag of water ruptured and water drained; was attended by untrained dais of Dehat when one arm of foetus came out of vulva, later another since the previous day and no urine was passed for 12 hours. She was in great distress and so was carried to the hospital.

PERSONAL HISTORY:—V.D. denied and all normal delivery.

PHYSICAL EXAMINATION.—Uterus asymmetrical; abdomen was distended and tonically contracting at frequent intervals and it was broader below transversely. Over symphysis pubis there was distension due to fullness of bladder. Both hands were coming out of vulva, a bit swollen and bluish in colour, the anterior one was more out than the posterior one.

ON PALPITATION:—Foetus was found lying transversely with head lying in right iliac fossa and breech in left iliac fossa. Uterine contractions were very frequent and tonic. No foetal movements detected. Bladder region was full and distended. On auscultation no foetal heart sounds were detected. Measurements of pelvis not taken but it was assumed that there was no abnormality of the bony pelvis.

Other Systems:—'Nil' abnormal.

P. V.:—(1) No oedema of vulva detected; (2) swollen arms of foetus with bluish colour; (3) no blood or meconium detected per vaginum; and (4) cord was not prolapsed.

Examination by putting the patient in lithotomy position revealed:—(1) Arms prolapsed; os fully dilated; (2) presenting

part high up; (3) shoulder, axillary fold and scapula and ribs could be felt; (4) shoulder fixed to pelvis to right iliac fossa; (5) breech to left iliac fossa; and (6) anterior hand to be the left one by shaking hand with foetus and posterior one to be the right one. Further I came to the conclusion that it was a case of compound presentation with a neglected shoulder presentation and a dorso-posterior lie.

TREATMENT:—Bladder was evacuated by catheter and parts cleaned and antiseptic applied. Patient was prepared for anal anaesthesia and then anaesthetized by general anaesthesia and the patient was put in lithotomy position. I did not attempt to put the presenting parts in the womb and to make internal version as it was impossible; for (1) the case had been very long in labour; (2) the uterus was tonically contracted; (3) the shoulder fixed in pelvis and lower segment was consequently 'thinned'; and (4) the foetus was dead.

Decapitation could not be done as: (a) it was an impacted shoulder presentation; and (b) the neck was not easy of reach but the thorax was easily accessible to the examining finger.

Evisceration, spondylotomy cleidotomy. The posterior hand was pulled down as far as possible and the right axillary fold and clavicle was detected by the left hand; using the left hand as guard and tracing anterior axillary fold of posterior arm, the right clavicle was cut by long scissors. The posterior arm thus came a little down and became loose which then was dissected out from the body of the foetus by scissors; more room now became available for further work.

The thorax of the foetus was detected by the examining finger and my assistant (compounder) was asked to give pull to the tied anterior arm upwards and an opening was made through the thorax by a pair of scissors and it was made larger by two fingers and the viscera was torn loose and then removed. The abdomen of the foetus was reached through the diaphragm by means of the fingers and using the pair of scissors.

The left clavicle was cut by long scissors, then by using traction of the anterior arm.

There still was difficulty in extracting the foetus. The cervical vertebral column was divided by scissors and the trunks of the foetus (a female) was delivered.

After severing, the head was pressed by suprapubic pressure by my compounder and it was extracted at 5-10 p.m. by traction on the lower jaw by inserting the finger in the mouth of the child without any difficulty.

The placenta was expelled within ten minutes and there was no p.p.h. and no injury to the birth canal. Parts were cleaned and dressed and put in bandage and the patient soon regained consciousness.

Morphine gr. $\frac{1}{4}$ and Atropine gr. $\frac{1}{100}$ was given to overcome shock if any and penicillin, ergometrine and pituitary, anti-tetanus serum 1500 was given and patient was put to bed. Penicillin 5 lacs was continued daily for 6 days morning and evening.

The patient was discharged in good condition after a normal puerperium, on the 12th day of her delivery.

Conclusion.—This was clearly a case of compound presentation of both arms which is very rare and its management is therefore, of great interest.

A CASE OF MULTIPLE HYDATID CYST OF THE PERITONEAL CAVITY

K. P. SHARMA, M.B., B.S.,

Ex-House Surgeon, Department of Obstetrics and Gynaecology, Darbhanga Medical College Hospital, Laheriasarai, Bihar.

PATIENT, a muslim female, K., aged 35, of Darbhanga town was admitted to the gynaecology ward of the D. M. C. hospital on 10-4-'51 for the treatment of a lump in her abdomen.

She had the following complaints:—(a) Pain in the abdomen: duration two months; (b) lump abdomen: duration two years; and (c) irregular fever with headache, epistaxis and spitting of blood: duration two months.

(i) H.:—3 children, youngest 17 years old.

M. H.:—L. N. M. P. 9-4-'51 continuing. Irregular 3-4 days every 20-25 days.



FIG. 1. General view of the abdomen of K., a case of multiple hydatid cyst of the peritoneal cavity.

GENERAL EXAMINATION:—Anæmia++; emaciation+; tongue clean; gums: unhealthy; bowels irregular.

Per. Abd.:—Epigastric veins prominent, two irregular separate lumps one in the umbilical region feels firm, circumscribed margins, dull on percussion; the other lump in the left iliac region, surface smooth, margins regular dull on percussion: mobility of both restricted. (Fig. 1).

Liver:—Left lobe enlarged, 5 fingers below costal margin, feels firm. **Spleen:** Enlarged four fingers below costal margin. Feels firm. **P. V.:** Cervix nodular, fibrosed, masses felt separately;

body of uterus could not be felt. *Heart*: N. A. D. *Lungs*: N. A. D. *Blood*: Diff. count—Poly: 61%; Lympho: 23%; L. M.: 6%; Eosino: 10%; Baso: nil. *Hb.*: 8 grm. per 100 c.c. *Stool*: No ova, cysts or exudate found. *B. P.*: 100/72; *Sputum*: No A. F. B. seen. *Urine*: Alb. nil; sugar: nil. *X-ray*: P. A. view of the chest: lung fields found to be clear.

The patient was treated on anti-malarial lines for her fever with Mist. spleen, oz. 1 t.d.s., for a week Cetamid 50 mgm. t.d.s., Fersolate 2 tablets t.d.s. Patient became afebrile, bleeding from gums stopped. Unfortunately no diagnosis could be arrived at regarding the abdominal condition and an exploratory laparotomy was done by Dr. B. Bhattacharya on 19-4-'51.

FINDINGS:—Multiple pearl-like cysts spread all over the peritoneal cavity. There was also a big cyst in the left lobe of the liver and another in the pouch of Douglas which was removed along with some of those from the peritoneal cavity (*Fig. 2*). 10% formalized saline was injected into the other cysts. Patient had pain in the epigastric region due to hepatitis, consequent on the injection of 10% formalized saline into the cyst of the liver. This was cured by the local application of antiphlogistine, sulphonamides orally and antibiotics parenterally. There was a slight gaping in the abdominal incision and on examination a cyst was found hampering the union of the wound. The cyst was cauterized on 26-4-'51, with formalin; the wound healed by granulation. The patient was discharged on 2-6-'51.

PROGNOSIS:—This case is likely to become ultimately fatal, though the patient may live for 3 to 4 years with a subsequent recurrence of symptoms.

Discussion.—A minute rupture of the cyst of the liver due to increase of intracystic pressure or even trauma might have caused a leak of hyd. fluid causing a spread of secondary cysts all over the peritoneal cavity.

I am very grateful to Dr. B. Bhattacharya, B.Sc., M.B. (Hons.), Lecturer of Obst. and Gyn., Darbhanga Medical College for the photos of the case and his kind permission to me to publish this case note.



FIG. 2. Photograph of pearl-like cysts from the peritoneal cavity after operation.

A CASE OF KNEE PRESENTATION

DR. B. J. PANDIT,
Contt. Hospital, Devlali.

THIS is a very rare presentation. It is one of the four attitudes of the foetus in breech presentation viz., (1) frank breech; (2) full breech; (3) foot or footling; and (4) knee. Occasionally one leg may retain the normal flexed position while the other may present as foot or knee according to the degree of extension of the hip joint. This may be incomplete foot or knee presentation. In all these varieties there may or may not be anything functionally wrong with the lower extremity. But in cases of frank breech or knee presentation, there is a possibility of dysfunction of the lower extremity either of joints or of muscles, thus preventing the normal mobility of these joints and resulting in such abnormal presentations. Of all deliveries, the breech deliveries are approximately 3.11%. Of the breech deliveries, full breech is more common; then come frank and foot or footling; whilst the knee presentation is only a clinical entity and is rarely noticed. To have knee presentation one or both knees must present. The knee or knees can present only when they are lower down and for this, there should be extension of one or both hip joints, instead of their usual flexed position. Usually the foetus adapts itself to the uterine cavity, with the usual flexed attitude for easy normal labour. In frank full breech or footling presentation, the length of the foetus, in its longitudinal attitude within the uterus remains the same. But this is not the case in knee or knees presentation. Here the length is longitudinally increased due to extension of hip or hips. To adopt such presentation in uterus, the foetus lies oblique with the head in one of the upper quadrants of the fundus thus adopting its increased longitudinal size of foetus in uterus. When due to some reason or other, this rare presentation occurs, the knees are engaged early in pregnancy thus adopting the increase in longitudinal attitude in uterus. In the eighth month of pregnancy, usually the presenting part does not engage due to want of sufficient space in the uterine cavity. If any abnormal presentation is noticed at this stage or even before labour, the foetus can be brought to the usual normal vertex presentation by external version. If the parts are engaged (which is rare) they can be dislodged and usually external version is successful with or without anaesthesia. But where this fails there is a possibility of these rare attitudes of breech presentation which can be ascertained by means of X-rays. In pelvic presentation the possibilities are either frank breech or knee presentation.

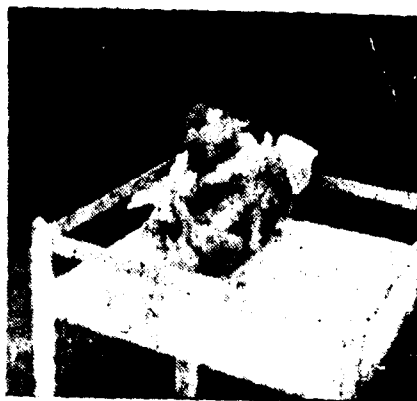
In knee presentation, as the parts are engaged early in pregnancy due to a virtually increased longitudinal attitude of foetus, there is no chance for the foetus to change its position afterwards during the pregnancy as the increased size of uterus tries to adapt

itself to the increasing size of the developing foetus in abnormal modification. The mechanism is essentially the same in all modifications of pelvic presentations.

Case report.—A primigravida came under observation in her 7½ months of pregnancy. Breech was detected but was found engaged. External version was tried but was not successful. In 8½ months of pregnancy i.e. after a month the findings were the same. So it was thought to be a case of frank breech. There was nothing wrong except for this position of the foetus. The patient was X-rayed. Except pelvic presentation, nothing particular was detected. This was due to the fact that both the legs were found folded over the thighs and not extended. The X-ray showed only the irregular arrangements of the lower limbs and did not give a correct idea of knee presentation.

The patient was allowed to go in for normal delivery of breech presentation as the X-ray did not show any abnormality either in the foetus or maternal pelvis. The patient was next seen only when she came in after the rupture of the membranes prematurely i.e. 2 weeks before the due date. P. V. Examination

revealed nothing to indicate that it was going to be a case of knee presentation. Both the knees resembled buttocks. The patient delivered normally, but with a living baby having an abnormal position of both knees with both legs fixed on the right side of the foetus with swollen knee joints. There was stiffness in both the knee joints and both the legs could not be brought to their normal position. There was also abnormality of both



the hands and fingers (see photograph alongside).

Conclusion.—Knee presentation, is very rare. In pelvic presentation it is a rare form. It can only occur where foot or footling presentation results in extension at the hip. Otherwise there must be either dystrophy of the muscles of the thigh, dystrophy of the hip or knee joints of one or both lower extremities to bring this about.

It always engages early in the pregnancy due to increase in the longitudinal length of the foetus and it is difficult to dislodge it by external version.

X-ray findings do not help in arriving at a definite diagnosis as both legs lie irregularly overlapping each other.

P.V. findings before and after the rupture of the membranes are misleading, as the knee or knees can both be mistaken for buttock.

Labour always terminates early as the uterus cannot adapt to the increased vertical length of the foetus beyond certain limits. The vertical length of the foetus is virtually increased due to extension of both thighs.

The mechanism is essentially the same in all modifications of pelvic presentation.

A CASE OF EMPYEMA THORACIS

VIRCHAND B. SHAH, L.C.P.S., (Bom.),

Subsidiary Medical Practitioner, 1/c. Pakhajan, Tq. Wagra, Dist. Broach.

An unmarried girl aged about 14 years, came to me on 19-1-'51 for the treatment of fever, with rigor and dry cough.

PREVIOUS HISTORY:—No history of rheumatism or of any contagious disease nor of dysentery etc. in the past.

FAMILY HISTORY:—Parents are living; father and mother are both healthy; father had an attack of pyelitis last year which responded to treatment; two brothers, both living and healthy.

PERSONAL HISTORY:—Patient is not addicted to any drug or drink habits except tea-drinking in moderation. Her weight has been constant; appetite good; bowels regular.

PRESENT ILLNESS:—She gave a history of fever with rigor and dry cough; the duration of illness was 5 days. The temperature rose daily at about 11 a.m., accompanied by rigor. This was followed first by a hot stage and then by a stage of sweating. The temperature came down at about 6 p.m.

Clinical findings:—R. S.—Nothing abnormal clinically; C. S.—Heart normal; Pulse: Rapid with good volume and tension, during temperature; B P—normal; A.S.—Throat: Uvula enlarged; Spleen: just palpable; Liver: normal; Bowels: normal; Urine: Albumin, nil; Sugar: nil; N.S.—N.A.D.

Treatment and progress of the disease.—In the absence of the requisite laboratory facilities, the case was diagnosed as one of malaria and was given Quinine in capsules of 3½ grs. each four times a day. There was no change in the temperature with this treatment for about a week. So the treatment was changed empirically and the patient was given an injection of 1 million units of sodium penicillin G intramuscularly and mist. alkaline t.d.s. also 2 sulfamerazine tablets thrice a day. This treatment was continued for about a week with no clinical response and no change in the temperature.

Then she was taken to Dr. R. M. Parikh, M.S. (Bom.) of Sevashram Hospital Broach, on 16-2-'51 for a consultation. On auscultation a small patch on the back of the right side of the lung in the middle zone was detected. Blood was examined for the total W.B.C. count. It was 19000 per c.m.m. The examination of urine did not show anything abnormal. On a presumptive diagnosis of unresolved pneumonia she was advised procaine penicillin 4 lacs units, every 24 hours. She received 9 such injections of procaine penicillin (Pfizer). Still there was no response. As there are no facilities in Broach, it was not possible to get her roentgenologically examined.

Just at this juncture, I could detect a few changes in the right side of the lung. V. F. and V. R. diminished on the right-side of the chest at the base.

There was some dullness on the right base as compared to the left. Bronchial breathing with a few rales was observed at the right base. I therefore, suspected tuberculosis and so advised an X-ray examination of the chest. She was then taken on 6-3-'51 to Dr. R.K. Desai, M.D. (Bom.) of Surat. An X-ray picture was taken, which showed a distinct basal opacity at the right base, suggestive of the presence of fluid. Apices were clear, but a middle zone in the right lung was suggestive of tuberculosis. Dr. Desai advised me to aspirate the pus by inserting a large bored needle. He also advised to instil 1 lac units of penicillin sodium G, and dihydrostreptomycin $\frac{1}{2}$ g. dissolved in 10 c.c. of normal saline; also injections of dihydrostreptomycin $\frac{1}{2}$ g. b.i.d. for 10 days. With due care and precautions regarding asepsis, I inserted a large-bored needle, after a local injection of Novurtoxin, but could not draw out any pus. My failure to draw pus may have been due to four factors:—(1) Pus may have been too thick; (2) I may have been due missing the pleural cavity; (3) pus may have been encysted; and (4) the piston and barrel of the syringe may have been ill-fitting.

I put her on dihydrostreptomycin $\frac{1}{2}$ g. b.i.d., for 10 days, and still there was no response. The patient was now expectorating sputum, which was white and resembled pus. At the request of the patient's relatives, I sent the girl to Emery Hospital, Anand with a note to Dr. Cook. On 19-3-'51, pus was successfully aspirated at the Emery Hospital Anand, by using Potain's aspirator, and results:—Colour and consistency—Yellowish thin pus; Pus cells + + +. Streptococci + +. Staphylococci + +. No other organisms could be detected.

On 20-3-'51, she was transferred to the T.B. hospital, and her general condition was good on admission except for some anaemia. On the night of 21-3-'51, she was suddenly found in a state of collapse with cold sweat and became unconscious. She was examined at 2-30 a.m. There was no air entry on the right side of the lung, and there was oedema of the left lung. Her condition rapidly deteriorated and she expired at 4-45 a.m. Her blood and sputum were not examined at the Emery Hospital. The cause of death was attributed to a spontaneous pneumothorax, super-imposed on an empyema in the same side.

Points of interest in this case.—1. It is difficult to assign any definite cause for the empyema; the patient did not show at any time prior to this illness any symptoms or signs usually associated with empyema, e.g., pneumonia, tuberculosis, septic foci, pyæmia, etc.

2. Though the middle zone of the right lung showed suspicious signs of tuberculosis, the apices were quite clear. A blood examination for B.S.R. and a sputum examination for T.B. might have thrown more light on this case.

I am grateful to Dr. R. M. Parikh, M.S., (Bom.), to Dr. R. K. Desai, M.D., (Bom.), and to Dr. A. Bramwell Cook, M.D., M.R.C.P., F.R.C.S., for their advice and guidance.

Note:—I very much wished to reproduce the X-ray picture of the chest, but could not get it from the patient's relatives who said they had mislaid or lost it.

Ultraviolet Light and Pulmonary Tuberculosis

Ultraviolet light can have no possible direct action on tubercle bacilli in the lung. The effect of ultraviolet light or excessive exposure to sunlight on pulmonary tuberculosis is believed to cause reflex pulmonary congestion, with a consequently increased liability to hæmoptysis; the flooding of part of the bronchial tree with blood containing tubercle bacilli is then liable to bring about extension of the disease.—(I. M. J., p. 64, March 1952).

A CASE REPORT OF VASCULAR SPASM AND ANGINA OF EFFORT WITH TREATMENT

HARENDRA NATH BAGCHI, M.B., B.M.S. (Retd.),

Calcutta.

H. F., 56, complaint:—(1) Foot-drop left foot; (2) aching pains in the left leg outer surface; (3) cramp-like pain in the left foot; (4) tired feeling in the left leg, particularly towards the evening; and (5) slight tenderness on deep pressure over perineal muscle.

History of present illness:—Footdrop first noticed in Jany. '52 on walking; was fairly noticeable for 2 days and then gradually improved and no footdrop now; there is no oedema of the leg and no tenderness of calf muscle. Blood pressure: Popliteal 156 m.m. of Hg. left foot 130 m.m. of Hg., right foot 120 m.m. of Hg. X-ray of heart—Heart normal; noticed varicose veins on left leg.

PRESENT CONDITION.—Footdrop barely perceptible. No aching or cramp-like pain in left leg and foot. The condition appeared to clear up within 3 days after taking calcium gluconate orally.

Family history:—Married, has two healthy children, a son 25 and a daughter 28 years. All members of the household are in good health.

Previous history:—Served for 34 years as a doctor. Dyspepsia for several years. Suffers from pain in chest, angina of effort since January '50 and the angina was fairly severe in January, 1951. Treatment for angina in April '51 and consisted briefly of:—

- Intravenous injection of Euphyllin and Redoxon (12).
- Intramuscular injection of Neo-hombreol and Bedome (8). (Testosterone propionate).
- Blood-letting before each intravenous injection; blood let out ranged from 20 c.c. to 5 c.c.
- Pentanitrin 2 tablets during day and neurolin 1 tablet at night. Pentanitrin is a vasodilator.
- Carters' liver pills daily as a purgative.
- Citrasol drink (half teaspoonful in hot water with lemon juice daily).
- Elbromal 1 teaspoonful at bed time.
- Cardophyllin 1 tablet in the day.

For constipation, takes the following at bed time because he suffers from piles. Carters' liver pill, 1 or 2; Liquid paraffin $\frac{3}{4}$ i; and Cream of magnesia $\frac{3}{4}$ i.

Treatment of the present complaint:—Berin 10 mg. t.i.d. and Beplex 1 tablet, Sandoz 'calcium gluconate' 1 tablet.

Examination:—Urine: normal, W.R. and Kahn: negative; B. P. 80 diastolic/135 systolic.

12-2-'52:—Aching pain in left leg from just below the knee to the foot; worse towards the evening.

Sedo-cordial 1 tablet for vascular spasms and oppression.

Electro-cardiogram and report of physician:—History of angina of effort since January, 1950. But from January '51 it has been getting more frequent and intense.

Findings:—Average heart-rate—72 per minute. Rhythm sinus mechanism P. waves—normal in all the leads.

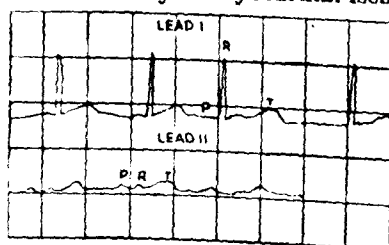
P.R. interval (a.v. conduction time)—0.18 sec. Q.R.S. Complex—Duration = 0.6 sec. Small R₃ and Deep S₃ left axis shift Q.R.S.—2 low voltage qR type in AVL and rs type in aVF (Horizontal Heart) Small S still present in V₅ (slight clockwise rotation along its long axis).

RS—T Segments are within normal limits.

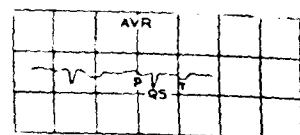
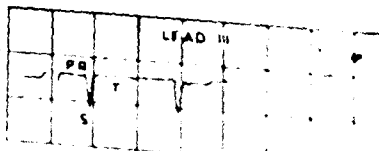
T waves—T₃ only slightly inverted Q.T. interval—0.38 sec.

Conclusion.—(1) Heart rate, 72 per minute; sinus rhythm; (2) left axis shift; (3) no evidence of coronary insufficiency at rest; and (4) no evidence of coronary thrombosis, recent or old.

In view of the above findings in the control (Resting) E.C.G. when there is a definite history of myocardial ischaemic pain, an exercise test was given. Patient felt pain and heaviness across the chest at the end of the exercise. But he completed the test nicely.



The E.C.G. tracings showed the following changes from

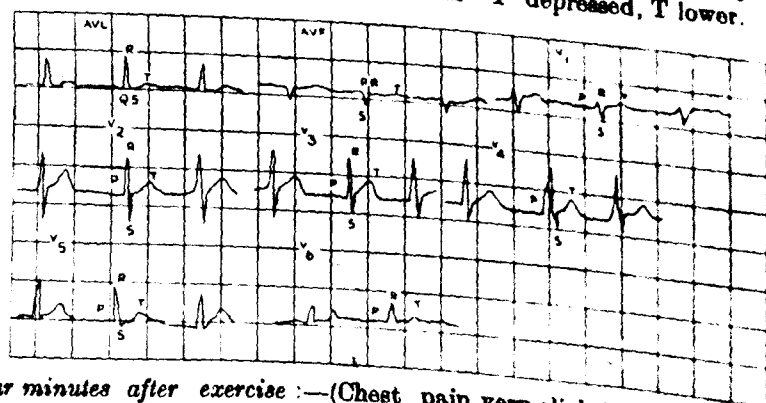


the control tracings:—Immediately after exercise (chest pain was there).

Lead I: Low voltage of Q-R-S with low T. Lead II: Higher voltage of QRS. Lead III: T upright.

Two minutes after exercise:—(Chest pain still present).

Lead I: RS—T slightly depressed with isoelectric T. Lead II: QRS higher voltage. Lead III: Upright T. Lead V4 RS—T depressed, T lower.

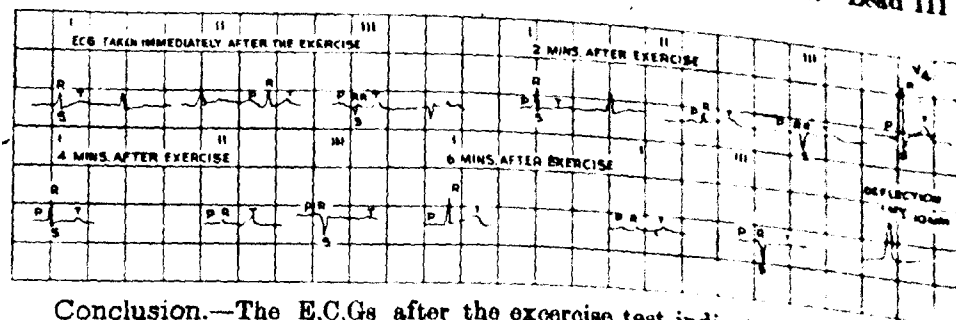


Four minutes after exercise:—(Chest pain very slight).

Lead I: Voltage lower, T becoming upright. Lead II: QRS getting small. Lead III: T getting lower.

Six minutes after exercise:—(chest pain disappeared).

Lead I: QRS getting more tall. Lead II: QRS getting small. Lead III: T wave isoelectric now.



Conclusion.—The E.C.G.s after the exercise test indicate coronary insufficiency after exercise.

REMARKS:—The patient is suffering from coronary artery disease.

43, Baghbazar St., Calcutta-3.

GUINEA-WORM DISEASE

BANSHI LAL BHATNAGAR, L.O.P. & S. (Bomb.),
Eye Specialist, Udaipur.

General.—Guinea-worm disease is very prevalent in and around Udaipur, and so I became interested in the subject, with a view to studying the extent of its prevalence and the preventive and curative measures that may be adopted to improve and ameliorate the condition of the suffering poor in the city. Several wells in the city and particularly three of the important sources of water supply to the town were systematically examined by me for the presence of crustaceans which are the intermediate hosts of the guinea-worm. All the three sources viz., (1) Sharbat Bilas Bawari; (2) Pichola lake; and (3) Toran Bawari contained cyclops and daphnia, besides paramoecia, and several other insects and their larvae. Daily examinations of samples of water from these three sources were made and Sharbat Bilas Bawari was found to contain a greater preponderance of cyclops carrying the guinea-worm embryos, than the other two. As many as 4 or 5 guinea-worm embryos were often found under the microscope in the guts of each of the cyclops. The cyclops from Toran Bawari and other local wells were not so heavily infested while all the cyclops from the Pichola lake were negative for infected cyclops. The species of cyclops present in the lake was different from the species in the wells.

I made a detailed study of the development of the cyclops themselves from the egg though the larval to the adult stage of the crustacean and found that it took usually 8 to 9 days for the eggs to hatch out into the adult cyclops.

Mode of infection.—It is in this adult stage that the guinea-worm embryos invaded these hosts, and once within the guts of the cyclops, they easily find their way into the human stomach through the drinking water. The hydrochloric acid of the stomach kills the cyclops and liberates the guinea-worm embryos into the human stomach.

The people of Udaipur obtain their drinking water largely from wells and tanks which as I have stated are all infested with cyclops; and while drawing their supplies in pots they also wash their hands, feet and faces in or near the wells and tanks. Persons infected with guinea-worm, (having sores) shed the embryos into the water; as these have a great avidity for water and for the cyclops in it, they promptly get into the water and into the cyclops and thus enter upon the intermediate cycle of their existence. The people use cloths to filter the water as they draw it into their pots but they are not sufficiently careful to see that the cloth used consists of sufficient folds to filter out the cyclops, and that there is no room for leakage of infective water into the pots through defects or drawbacks in the method of filtering.

In this way the cyclops charged with guinea-worm embryos get into the pots along with the water; and this infected water is taken home and used for drinking without any further straining or boiling. Such water, infects the human system with guinea-worm. The guinea-worm embryos, which are set free in the stomach (as already described) pierce the stomach wall and travel mainly towards the lower extremities and develop into large guinea-worms under the subcutaneous tissue. Some hold the view that the water-carriers get infected on their back and shoulders and the infection thus enters through the skin. But as even persons who are not water-carriers also get the disease it cannot be said that the infection is only through the skin of the back or shoulders.

SYMPTOMS:—Guinea-worms appear usually in the rainy season and very often the lower extremities and forearms of the human body are the seats of infection, i.e., under the subcutaneous tissue; the worms may however, appear in any part of the body e.g., the tongue, the abdomen, the penis, the scrotum, etc. 75% of the people get urticaria on the day previous to its appearance; it appears in the form of a blister; some feel a sense of heaviness, dullness and itching; a burning sensation and an inflammation are also felt, accompanied by intense pain at the

presenting part. On account of the swelling and pain, the man usually gets fever with all its attendant symptoms. A vesicle appears as a blister containing a fluid which is first clear but later becomes opaque and purulent. This bursts in a few days forming a round ulcer, in the centre of which a small hole is noticed which would admit a probe. It is through this hole, that the guinea-worm appears. Sometimes it may coil up and form an abscess. When the guinea-worm appears, it comes out sometimes easily, and sometimes only after a lot of trouble. In some cases about half an hour after the appearance of the urticaria, the patient gets fever and suffers from severe pain that makes it difficult to move the part which becomes tender. Suppuration starts, an abscess is formed or sometimes even necrosis of the bone may occur. Stiff joints are not uncommon; even death may result from severe septicaemia.

A patient may harbour two to ten guinea-worms at a time. It has been observed that the greater the number of the worms in the system, the lesser the pain. Guinea-worm disease affects both sexes and may occur at any part of one's life, though the young are much more susceptible to it than the aged. It is rarely found in children below five years of age and in old people; but a child of one month was once reported to have got the guinea-worm infection on his shoulder.

INCUBATION:—The infection generally takes a year to manifest itself on the surface of the body, though it begins to develop in the tissues from the moment of its entry into the stomach-wall. It remains dormant till the weather gets cloudy; and then starts the urticaria, that heralds the appearance of the worm through a blister that indicates the location of the worm.

PROPHYLAXIS:—Since the infection is caught from rivers and bawaries, water from these places should as far as possible be avoided, and if it must be used, should be boiled or efficiently filtered before use. The guinea-worm is not destroyed by common disinfectants like, Pot. permanganate, Chlorine, Bleaching powder, slaked lime etc. It is therefore best to boil all drinking water.

Bawaries should be closed and converted into pucca wells, constructed and maintained with proper conservation based on sanitary and hygienic principles.

TREATMENT:—Different kinds of indigenous treatment are in use in different localities, but there is no satisfactory treatment in Allopathy, Ayurveda or Unani systems. After trying various chemicals, I happened to tumble upon a drug which when injected intravenously promptly relieves the agony of the acutely suffering patient. It is now available in the market as D.C.N.

Some of the cases treated with the D.C.N. are given below:—

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CASE 2.—N., 23 years, H. M., had guinea-worm about a month back which broke while being taken out. Great pain and inflammation. A hard knot on the left leg. D.C.N. injected on 18-8-'51. The painful symptoms all subsided on the 3rd day. An abscess was formed from which pieces of guinea-worm were taken out. The patient took 12 days to recover.

CASE 3.—K., 35 years, H. M., had two guinea-worms on right ankle and left thigh. Inflammation; was given 3 injections, one every third day. Took 15 days to recover.

CASE 4.—B., 8 years F. child carried guinea-worm for two months in the right knee joint. D.C.N. injected (25-8-'51) took 4 days to be able to move the right. Limped about on the 7th day. Another injection on 31st August, 1951. Took one week more to get cured.

CASE 5.—K., 35, H. M., had 3 guinea-worms in right ankle left sole and right thigh. Got no relief after the 1st injection of D.C.N.; felt better after the 2nd Guinea-worms in right ankle and right thigh dissolved. An abscess was formed on the sole which was cured in 15 days. The abscess did not show any remnants or broken pieces of the worm.



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The Antiseptic

ESTD. 1904.

A Monthly Journal of Medicine and Surgery

Published on the 16th of every month.

Editors: U. RAMA RAU & U. KRISHNA RAU, M.B., B.S.

Asst. Editor: U. VASUDEVA RAU, M.B., B.S.

Editorial & Publishing Office:

"RAMARAU BUILDINGS," 323-24, Thambu Chetty St., Madras-1.

Annual Subscription: Rs. 7-8-0: Foreign—Rs. 10—Post Paid.

Vol. 49

APRIL, 1952

No. 4

THE TREATMENT OF TUBERCULOUS MENINGITIS

THE treatment of tuberculous meningitis has become easier and is on safer ground since the discovery of streptomycin. According to PETER BUXTON who writes on the subject in the Dec. 1951 issue of the *Post-Graduate Medical Journal*, "the survival rate has been approximately 1 in 4, though some centres have claimed survival rates of 50%". According to a report of the Ministry of Health, the most reassuring feature is the high percentage of survivors classified as clinically well after two to three years observation. All workers however are agreed that the most important single factor affecting prognosis is the severity of the disease at the start of treatment and the necessity for early diagnosis.

Two important and characteristic findings in post-mortem examination are a widespread arteritis and a gelatinous exudate most marked over the base of the brain. The arteritis leads to thrombosis and cerebral softening and usually accounts for the sudden onset of focal signs. The exudate is converted in course of time to fibrin, and accounts for the blocks that arise in the cerebrospinal fluid pathways. The sites of these blocks are the cisterns chiasmatica and the transverse fissures, producing a communicating hydrocephalus and sometimes accounting for the pituitary and hypothalamic disorders found during treatment. Sometimes this obstruction at the transverse fissure causes obstruction to the venous return from the choroid plexus by blocking the great vein of Galen and thus leading to an enormous increase in intraventricular pressure. These pathological findings have a bearing on the treatment of the disease in as much as they explain why streptomycin sometimes fails to reach the site where the tubercle bacilli are found.

In the treatment of tuberculous meningitis, general measures still occupy a very important place. Bed rest, good nursing, and nutritious diet still form the sheet anchor of successful therapy. Streptomycin has considerably influenced the course of the disease. Most workers are agreed that it acts best if given intramuscularly twice daily for the first six months. 2 g. per day is given for adults and 20 mg. per lb. of body weight per day for children. A dose of 1 gm. per day has been suggested in order to reduce the incidence of damage to the eighth nerve but most workers prefer the larger dose. On intramuscular streptomycin, 2 g. per day, levels of 4-16 microg. are found in the spinal fluid, depending on the activity of the meningitis. Consensus of modern opinion is in favour of giving streptomycin intrathecally along with intramuscular injections. In cases uncomplicated by blockage of the cerebrospinal fluid pathways, intrathecal injections can be given by the lumbar route, the dosage being 100 mg. daily for adults and 50 mg. daily for children. Meticulous care must be given to the technique of intrathecal injections as most cases require over 100 lumbar punctures. Dr. Buxton in the Middlesex Hospital, London uses the following technique. First to draw into a 10 ml. all glass syringe 1 ml. of a solution containing 100 mg. per ml. of streptomycin dissolved in pyrogen-free distilled water; with the lumbar puncture needle *in situ*, the syringe is attached and cerebrospinal fluid slowly drawn to the 10 ml. mark. The streptomycin solution thus diluted with cerebrospinal fluid, is then slowly re-injected. If the solution is rapidly injected there may be severe headache and actual cerebral damage. When for some reason spinal block or basal cistern block arises, then the intraventricular route must be used for intrathecal therapy. This can be approached by making frontal burr-holes.

The diagnosis of spinal or basal cistern block is clinically not easy. The following features will give a clue. Severe headache and vomiting, papilloedema, a rising protein figure of over 600 mg. per 100 ml., increasing difficulty in withdrawal of lumbar fluid are indications of spinal block.

The dose of streptomycin recommended for intra-ventricular therapy is 50 mg. per day for adults and 25 mg. per day for children, alternate ventricles being used on successive days. Ventricular treatment should be continued till the spinal block is reduced, after which treatment has to be continued by the lumbar route.

Direct instillation of streptomycin into the sites where maximum exudate is known to be present—the chiasmal region and the interpeduncular space—has been attempted. Such treatment requires extensive neuro-surgery and is considered to have little place in the present day management of the disease.

It is generally agreed that daily intrathecal injections should be given for the first six weeks. After this the intensity of treatment depends on the clinical and laboratory findings. The most reliable

guides to progress, in the spinal fluid are the cell count and mgm. content. A raised lymphocyte count indicates activity of the disease. A falling sugar figure is suggestive of the activity of the disease. Intrathecal treatment should be continued while there is still clinical evidence of the disease in the central nervous system, or if the spinal fluid contents remain grossly abnormal. As improvement takes place clinically and in the laboratory findings, intrathecal injections may be reduced in frequency, but they should not be stopped entirely till there is no clinical evidence of activity, till the sugar and chloride contents of the spinal fluid have risen to within 10 per cent of the normal and till the cells are less than 20 per c.m.m. When this stage is reached intrathecal therapy is stopped, but intramuscular therapy is continued for at least a month. Weekly lumbar punctures are then done to confirm that improvement is maintained. On these occasions the streptomycin content is estimated; levels of more than 2 microgram per ml. on intramuscular treatment alone indicate breakdown of blood-brain barrier, strongly suggestive of activity of the meningitic process. If improvement is maintained when intrathecal therapy has been stopped for a month, intramuscular treatment may be discontinued. Monthly clinical and lumbar puncture examinations should be done to check progress.

Para-amino-salicylic acid should be given orally to all cases having streptomycin therapy. Dr. Buxton recommends 20 gr. of P.A.S. per day per adult given in divided doses four times a day. He is of opinion that the granule form is best tolerated. Side-effects of the drug such as anorexia, nausea, and vomiting should be remembered.

The main principles of treatment is to bring an adequate concentration of streptomycin to the site of injection. The combination of streptomycin and P.A.S. has brought hopes of a cure in all cases of tuberculous meningitis, a previously fatal disease and has certainly improved the prognosis and shortened the course of tuberculous infection. It must not be forgotten however, that general measures and good management are still of the utmost importance in getting good results.

RECOVERY AFTER CORONARY OCCLUSION AND INSUFFICIENCY

Arthur E. Master and Harry L. Jeffe of New York, in the *Journal of the American Medical Association* (December '51) have tried to find an answer to whether prognosis in patients who survive an attack of coronary occlusion is much better than has generally been expected. All these years prognosis for all patients with coronary occlusion was considered to be poor. Later, the introduction of early

and complete bed rest, a low calorie diet and the discrete use of drugs saved many lives. Under modern treatment the mortality rates in first attacks is somewhere in the neighbourhood of 10%. The early pessimism concerning this disease is gradually diminishing.

The progress of patients who have survived an occlusion has, hitherto received very little attention. Many physicians and laymen still believe that a coronary occlusion necessarily causes a marked reduction in the patient's activities and a marked decrease in his life expectancy. It has been stated that the average duration of life after an attack of acute occlusion is 4 years. Recent study has however, increased optimism concerning the coronary occlusion. There is more and more evidence coming forward that a large number of patients who have made a complete recovery have led active lives for many years. After a study of 554 patients during a period of 25 years the above writers have come to the conclusion that prognosis in patients who survive an attack of coronary occlusion is much better than has hitherto been expected. In the present series, almost 2/5ths of the patients made a complete functional recovery and 1/4th of these have already lived for more than 10 years. In addition a fair proportion of the patients (6.5%) made a complete functional recovery and lived for many years before dying of another attack. The authors feel that a patient who makes a complete recovery from coronary occlusion has a 95% chance of living for more than 5 years and a good chance of living more than 10 years. The authors however, point out that the majority of their patients were seen in private practice and belonged to the upper economic strata and therefore, to a class in which coronary attack was recognised earlier and treated with more care than those in the lower income groups. From a study of their cases the authors come to the conclusion that many persons who recover from a coronary occlusion are capable of resuming their places in all the various phases of industry. Many can perform their usual work as do persons without coronary disease.

Instead of discouraging patients from working, the writers are of opinion that physicians should encourage them to resume some form of work as soon as this is physically possible. This may take six months after the first attack. Psychologically also it is necessary for these persons to be employed, for otherwise, after a heart attack they develop considerable anxiety concerning their state of health. At times this becomes very serious and is far more damaging than the cardiac disease itself. Idleness as in all other diseases exaggerates the tendency to anxiety and self-pity whereas full employment serves to restore the patient's mental well-being.

According to the writers the location of the infarct whether anterior or posterior, did not play a role in the subsequent course of the life of the patients. They also found that patients with acute coronary insufficiency fared better than those with coronary occlusion.

The results of this study are of significance to the doctor, the patient and his family and to the industry. Coronary disease is a most frequent heart affection attacking people in the most active and productive periods of their lives and therefore, the general attitude to be taken towards the future conduct of those who have survived an acute coronary occlusion constitutes a major economic and psychological problem of our times. In the past, the pessimism of both the physician and the lay person has led to a great deal of psychological and economic invalidism. This approach is no longer advisable. In view of the data which are now available, both the doctor and the patient may confront coronary occlusion before and after an attack, optimistically and positively. The patients should be encouraged to live as normal lives as possible avoiding however, excessive mental and physical strain. Drs. Master and Jeffe feel that in this way we shall send many more patients back to a happy life rather than into the exile of invalidism and despondency.

THE 28TH ALL INDIA MEDICAL CONFERENCE

ELSEWHERE in this issue we print a summary of the speech delivered by Dr. T. S. TIRUMURTI while presiding over the 28th All India Medical Conference held at Ahmedabad.

Dr. Tirumurti after a long and distinguished career in the medical profession has been called upon to fill this responsible job and his Presidential Address contains very many thought-provoking and useful suggestions.

He, first of all, insists in the belief of the Fatherhood of God and the Brotherhood of man. Religion according to him, gives strength for noble endeavour and should instil into us a desire for social service. He also puts forward a strong plea for World Peace and calls upon every medical man to prevent wanton waste of human life.

He calls upon the medical profession to support prohibition as, in his opinion, drinking should be considered disreputable and a menace to health. He condemns the attitude of some politicians who are trying to persuade the Government of Madras to give up prohibition on the plea that a large part of the revenue is lost. While conceding that prohibition is necessary and very beneficial to the masses it cannot be denied that at the present moment there is a lot of illicit distillation and consumption of harmful liquor which is injurious to the health of the people. As to how this could be combated, is a matter for the Governments of the day to decide, but this is a very important aspect on which we, as medical men should advise our government.

Dr. Tirumurti desires that the system of post-graduate training should be developed on sound lines. According to Dr. Tirumurti, there is ample justification for medical men and women to go abroad for post-graduate training as it widens their outlook and makes them 'more eager to advance medicine in their country on return.' Dr. Tirumurti evidently forgets that the days are over when special values were attached to foreign diplomas and degrees. At the present moment with all the special facilities for post-graduate training offered by our Universities, the Government and the teaching institutions prefer those with post-graduate qualifications of our own Universities. Perhaps, this is as it should be, for as Dr. Tirumurti himself admits the medical men and women who go to foreign countries concentrate only on the theoretical aspect of the subject from an examination point of view and very often feel compelled to return to India earlier than arranged owing to financial and other considerations. He however, praises the efforts of the Indian Medical Association to help medical men and women to go abroad to get post-graduate training.

Dr. Tirumurti is against the suggestion of the Indian Medical Council with regard to the introduction of the shift system in imparting instruction to medical students. While it is good to accept his suggestion that Government and philanthropists should come forward to start more medical colleges, he forgets that this question has a practical aspect. Under the existing financial conditions the Governments of the day are unable to find funds to start more medical colleges and therefore the only alternative practical suggestion seems to us to be the introduction of the shift system. We are afraid we cannot agree with Dr. Tirumurti on this point.

We agree with Dr. Tirumurti that medical research is being carried on in a very limited manner in our country and endorse his plea for better wages for the research worker.

He deplores that it has not been possible for the amalgamation of the Indian Medical Association with the All India Medical Licentiates' Association. We have in the columns of our journal, always been advocating the amalgamation of these two associations and the formation of one Association in our country.

We agree with Dr. Tirumurti when he appeals to all medical men to sink their differences and unite to form one medical body.

Dr. Tirumurti must be congratulated on his very thought-provoking presidential address. We are sure that under his able guidance the Indian Medical Association will, in the current year go from strength to strength.

PRESIDENTIAL ADDRESS

OF

Dr. T. S. TIRUMURTI, B.A., M.B. & C.M., D.T.M. & H.

President of the Indian Medical Association for 1952, at the Annual Conference held at Ahmedabad on 17-2-'52.

WHILE presiding over the 28th All India Medical Conference held at Ahmedabad on Sunday, the 17th February 1952, under the auspices of the Indian Medical Association, Dr. T. S. Tirumurti said :—

We are assembled today in the great land of Gujarat which gave us two of the noblest sons of our motherland, the great Mahatma Gandhi, who brought us freedom without bloodshed and Sardar Patel who unified the country, from the Himalayas to Cape Comorin, by a miracle of bloodless political revolution. We hope that the necessary social revolution will also be brought about by such peaceful methods based on Truth, Ahimsa and Dharmic ideals.

Religion and Medical Men

We belong to many faiths and religions. But we recognise the worth, the dignity and importance of the individual human being. We believe in the Fatherhood of God and Brotherhood of man. History and recent wars have unmistakably shown us how people belonging to the same religion warred with one another and destroyed the people of their own religion who belong to the other nations. They were all democracy-loving people. Religion gives us strength for noble endeavour. Religion instils into us that fellow-feeling and desire for social service, which ought to characterise medical men and women. Let us convince the public that medicine is not divorced from religion, and that science and religion are compatible with each other. In the words of G. B. Shaw "what I mean by a religious person is one who conceives himself or herself to be the instrument of some purpose in the Universe; it is a high purpose and is the motive power of evolution i.e. of a continual ascent in organisation and power and life and extension of life". The purpose of our profession is a high and noble one and therefore according to Bernard Shaw we may all claim to be religious persons.

World Peace

It is the ambition of our profession to save life and to preserve it. The present mad rush for armaments and financial aid to many countries to arm themselves threaten the very structure of our civilization. Medical science may have made some progress in times of War but real progress has been mainly during the years of peace. We consider that life is sacred and that it is our duty to prevent wanton waste of life and particularly young life.

Our Association

It is a matter of satisfaction that the national medical association of India namely, the Indian Medical Association has now attained its due status in this country and in the international sphere. This organisation of ours will soon be mutually affiliated to the British Medical Association and is already a founder member of the World Medical Association. It is also held in high esteem by the World Health Organisation, the American Medical Association and most of the national medical associations of other countries.

In this connection we must recall with gratification that the foundations of this great medical organisation were laid in the year 1928 at Calcutta principally by the late Sir Nilratan Sirkar of Calcutta and Dr. Deshmukh of Bombay. From a very modest beginning with only 250 members it has now over 14,000 members and over 20 provincial and about 400 local branches scattered all over India.

Efficiency and unity among the rank and file of the practitioners of modern medicine are essential in order that we may obtain full recognition by the Government and other authorities concerned. In the best interests of the people as well as the profession we must play an important role in advising the Government on all matters connected with medical education, medical relief, public health and medical research. I, therefore, take this opportunity to request all those registered medical practitioners in India, who have not yet joined the Association, to enrol themselves as members of this organisation at the earliest opportunity. "United we stand and divided we fall" is true of the medical profession as of other associations of men.

It is a great pity that at the very start of our infant democracy we and our Government had to face the perplexing problem of the unfortunate displaced persons. In our humble way, our association raised a small fund and opened several centres for relief and rehabilitation of refugees. We have tried to help some of the displaced doctors in their rehabilitation. We realise too well how inadequate has been our help. We can, however, assure the Government that they will have our wholehearted and sincere co-operation in solving this important problem.

Welfare State

Government of the people and by the people themselves is democracy. Historians tell us that this system of Government was prevalent in ancient India. We may thus claim that democracy had its birth in India. There is much to learn from the democratic institutions of the World. But most of our people feel that the present parliamentary system of the West is too costly for a poor country like ours. Sri Arambindo expressed his firm conviction that this imported western parliamentary system is not likely to succeed in India. Real democracy must be well-laid on the foundations of the village Panchayats. All matters connected with village reconstruction in all its aspects should be entrusted to autonomous village Panchayats leaving only a limited and circumscribed power in the hands of the Central Government. The great importance of regeneration of our neglected villages, their adaptation to modern requirements and a new orientation of rural health services cannot be over-emphasized. We, medical men, feel that the present system of Government should be replaced by a Government having its solid foundations on strong and efficiently functioning small autonomous units.

The Drink and Drug Evil

In Mahatma Gandhi's words "the drink and drug evil" is in many respects infinitely worse than evils caused by malaria and the like; for, while the latter only injures the body, the former saps both the body and the soul. In no part of the world, is prohibition as easy to carry out as in India, for with us, it is only a minority that drinks. The majority of our people generally considered drinking as disreputable and a menace to the health of our people and a terrible drain on the poor man's slender resources. Madras has been the pioneer to introduce prohibition over a decade ago. It is however, regrettable that attempts are now being made by certain politicians to give up prohibition on the plea that the Government has lost a large part of its revenue, which can be utilised for other nation building purposes. We, medical men, should give a lead in this matter and tell them that by ruining the health of the nation in one direction, no advantage can be derived by expenditure in another direction. Our considered opinion should be that prohibition is a very important item in the building up of a Welfare State. Our silence in this matter as well as in the case of drug addiction may be construed by the people, that the medical profession is more interested in disease than in health.

Medical Men and Military Training

Having lived through two great World Wars and dreading the possibility of a third which looms darkly in the political horizon, I consider it very necessary

that, in the long run, all medical men who are physically fit, should be given compulsory military training. Military training should be made compulsory for all future entrants into Government medical and health services. Those private medical practitioners who are willing to undergo military training should be encouraged by all possible means and by constituting a civil medical reserve. Similarly an ancillary reserve of trained nurses, ward orderlies, compounders etc., in the civil department can be constituted to meet emergencies.

Post-graduate Education

If the medical needs of our country have to be met, proper under-graduate medical education has to be expanded considerably. It is however, equally if not more, important for us to develop a sound post-graduate training, because this not only gives us the teachers who will train the cream of our intelligentsia into responsible medical men and women, but also provides men for medical research, which is the backbone of scientific progress.

In considering post-graduate medical training, two aspects come to our mind. One is the basis of real training and research and the other is a question of acquiring a "Degree" or a "Diploma". So long as the acquisition of such degrees and diplomas help in securing good posts in Government and other services, the desire to acquire these will naturally continue. If proper standards are maintained, these degrees and diplomas are, of course, certificates of higher value. Because of the dearth of well-established post graduate medical centres and also because of a lack of proper encouragement, there is a tendency among young medical men and women to seek post-graduate training abroad. Such an exodus should be encouraged under the existing circumstances, as it widens their outlook and makes them more eager to advance medicine in their country on return. Because of the unusual value attached to foreign post-graduate degrees and diplomas, a large number of our young medical men and women in foreign countries concentrate on the theoretical aspect of the subjects from the examination point of view. They, therefore, do not get the desired practical training. Moreover, most of them return to India due to financial and other considerations, as soon as they acquire the degree or diploma. It is very much regrettable that even Government-sponsored scholars are allowed to indulge in such practices and on their return they are mere foreign diploma holders instead of being trained surgeons, physicians or specialists.

Hence it must be repeatedly stressed that, though degrees and diplomas have their value, systematic and thorough training in any branch of medicine or research, is, in the long run much more important. This problem can be solved by establishing fully equipped and well-staffed post-graduate centres in India so that our brilliant young medical men and women can acquire the corresponding post-graduate degrees and diplomas in this country. It is, however, essential for our Government and other authorities concerned to attach the same value to the Indian post-graduate degrees and diplomas. Our post-graduate students and particularly those sent abroad by the Government and local authorities should be allowed to proceed abroad only for further practical and systematic training and research, preferably after acquiring the post-graduate degrees and diplomas in India. Unless such a scheme is adopted in our country in the near future, I am afraid, there would not be a real advancement of medical science in this country for years to come.

It should also be pointed out in this connection, that periodic 'brain dusting' is essential for medical teachers to keep themselves up-to-date. For the advancement of medical education, the Government should arrange to send out middle-aged medical teachers, with some more years of service to count, to visit institutions in foreign countries, even for a short period. If the authorities of the medical institutions or the Government are not in a position to afford the full cost, a scheme of sharing necessary expenses with the teachers concerned should be evolved.

Roll of I.M.A. on Post-graduate Training Abroad

I feel that the Indian Medical Association would be ready and willing to give the necessary advice to persons intending to go abroad as post-graduate students or as visiting teachers. It may be advisable for our association to appoint regional advisory committees for this purpose.

I may, on your behalf and my own, acknowledge with thankfulness the yeoman services Dr. S.C. Sen, our Honorary General Secretary is rendering, as our, may I say, 'Ambassador' to the great medical associations and institutions of the West to establish personal contacts. It is a noteworthy achievement of this association that Dr. Sen has been able to arrange for our young medical men and women, a large number of internships and other similar places, by facilities obtained by him in Mount Sinai Hospital, New York has been followed up by similar training facilities in other American and Canadian teaching and other well-equipped hospitals. We know how useful such training abroad is for the future of Medical Education in India.

World Health Organisation

I shall be failing in my duty if I do not mention the part played by my friend, Sir A. Lakshmanaswami Mudaliar in the W.H.O. We look to him to achieve greater progress in obtaining adequate financial help, specialist personnel, world university co-operation of students and staff, facilities for travel-fellowship, services regarding the scheme of up-grading some of the medical institutions in this country, sponsored by the Government of India.

Indian Medical Council and Medical Education

The Executive Committee of the Medical Council of India is understood to have recommended one and a half years of pre-clinical training in pre-clinical subjects, three years for clinical subjects, followed by a year of internship in a hospital recognised by the University. Further, in order to increase the number of medical men and women, a double-shift system in instruction to medical students will be introduced where suitable arrangements can be made by the Universities. Sir A. Lakshmanaswami Mudaliar has stated in his address at the recent annual celebrations at the Madras Medical College that he was shocked to hear these suggestions. In his opinion, the responsibility of increasing the number of medical men in the country is not the duty of the Medical Council of India which has been statutorily constituted to establish minimum standards of qualifications in University education. He doubted whether the Council can dictate to the Indian Universities as to what they should do and thus interfere with the autonomy of the Universities.

We should certainly urge on the Government and the fortunate philanthropists to start more medical colleges and find finances for them to increase the number of qualified medical practitioners, who are required to meet the health needs of the people.

Central Institute of Medicine

One of the important recommendations of the Bhoré Committee is the creation of an All Indian Medical Institute where professors of repute and standing would train medical teachers and where a number of medical graduates can carry on research work under guidance. This recommendation could not be implemented owing to financial difficulties. In view of the generous grant of £1,000,000 made by the New Zealand Government under the Colombo plan for the specific purpose of starting a Central Medical Institute, it is hoped that the Institute may be brought into fruition at a not too distant date. It is learnt that the Central Institute may have a small under-graduate medical college attached to it.

Medical Research

Medical Research in this country is at present confined mainly to the few Research Institutes. We have also to admit, with regret, that the amount of research work that is being carried out in our medical colleges is very limited. The reasons for this state of affairs are many. Our young men cannot get a living wage if they take to research as a career. Therefore, research cannot generally attract many brilliant young men and women who have the enthusiasm for research. Only a few of the medical colleges have research facilities worth the name. The Indian Council of Medical Research has been playing an important role in the advancement of medical research in our country. Instead of simply calling for the proposals for research, the I.C.M.R. should take the initiative, consult a small group of experienced workers actively engaged in the research pertaining to the subject and ascertain after deliberations the most important and pressing problems, awaiting solution and chalk out roughly the profitable lines of further enquiry and investigation which are likely to yield useful knowledge. The success of any research project depends mainly on the selection of the proper worker. In order to ensure that the worker put forth his or her best efforts, the I.C.M.R. apart from paying a decent wage to him or her should assure him or her that the entire credit for the work done by him or her would go to him or her.

Medical Missions

The medical profession in general and our Governments specially have much to learn by a study of the Missionary Medical organisations. In the mission medical field one enters the fold as a "calling" rather than as an "employment". This mental attitude makes a lot of difference. Barring specified salary, the mission organisations ensure economic security and other necessary facilities for medical missionaries. In our country, rural medical relief may be tackled by a well-organised medical mission organisation sponsored by Government. It is no use, mere preaching that medical men and women should settle down in rural areas and work with missionary spirit, without a missionary organisation which will look after their comforts and which will place them above want and enable them to work with dignity and honour. Insurance of the workers and their families, provision of a scheme of provident fund, provision for holidays and study leave, provision for education of their children, old age pension etc., must be the incentives for attracting the best persons to the mission medical service for rural and outlying areas, not mere preaching to medical men and women about missionary zeal and spirit for rural medical relief.

Medical Registration Act and Suppression of Quackery

It is a pity that no serious attempts have so far been made by the Government for the suppression of quackery. It is probably not realised by our authorities that this is necessary not in the interests of qualified medical men but for the real advancement of health measures for our people. It may not be possible or desirable for any Government to prevent legally any of the unqualified practitioners from practising their professions and take away the bread out of their mouths. What can however be done is to prevent by legal steps the further creation or influx of unqualified practitioners in any system of medicine. I had the privilege to be associated with the drafting of the Travancore Medical Practitioners' Act by which all practitioners of the different system of medicine were registered under suitable categories. All these who were in the practice of the profession at the time were eligible for registration, if they produced certificates from recognised Government officers to the effect that they had been in the practice of the profession, whether Allopathic (Modern Scientific), Ayurvedic, Unani or Sidha. Such an act is necessary, if fresh unqualified persons are not to be allowed to flourish in increasing numbers. When unqualified persons are not to be allowed to practise, why should it be different in the case of legal practitioners cannot practise, why should it be different in the case of medical practitioners? The Indian Medical Association has been requesting the

Government to take effective measures to prevent such unqualified practice. The health of the people should not be played with, by irresponsible quacks. Quacks usually thrive on the gullibility of the public, who are illiterate and uneducated. This is made possible to a large extent, owing to the fact that qualified and scientific medical help does not reach or is not available to a large percentage of the population who live in the villages.

State Insurance of Workers

Our Government has recently introduced the Employees' State Insurance Scheme which is the first of its kind in South East Asia. By working the pilot scheme in Delhi, causes which might delay its implementation in the States could be avoided. The introduction of the scheme by stages will enable Dr. Katial to recruit and train the staff in a planned manner. We however hope that efforts to implement the scheme in other States will be taken as early as possible.

Amalgamation of I.M.A. With A.I.M.L.A.

It is unfortunate that in spite of repeated attempts to bring about an amalgamation between these two All-India Associations of Medical men, it has not been possible so far to achieve the desired result, even though the majority of members of the A.I.M.L.A. are also members of the Indian Medical Association. I am, however, proud to say that so far as Madras is concerned, the A.I.M.L.A. has practically merged itself with I.M.A. It is regrettable that certain members of the A.I.M.L.A. who may have vested interests, wish to maintain this class and caste distinction among the members of the profession. The medical licentiates are in a majority in the I.M.A. Why then, this inferiority complex on the part of the licentiates who are the backbone of the profession? We should sink all our differences and unite.

Conclusion

Quoting Lord Horder, he said:—"For thousands of years medicine has united the aims and aspiration of the best and noblest of mankind. To deprecate its treasures is to discount all human endeavour and achievement at naught."

As I am not one of those who think that former days were better than this, I look forward as well as backwards. I think the wiseman was a bit bilious, when he apportioned dreams to the old and visions to the young. Through the science and art of medicine, i.e., doctoring can attain the highest place in social economy of the future that it has ever done in the past. It has been said that the technology of medicine has outrun its sociology. It will fall to you to make this adjustment and make it without sacrificing the individuality of the patient, who places himself in your hands with such confidence and with such hope."

Dr. Tirumurti concluded his address with the following quotation from Louis Pasteur:—

"Do not let yourselves be tainted by a barren scepticism, nor discouraged by the sadness of certain hours that creep over patients. Do not become angry at your opponents, for no Scientific theory has ever been accepted without opposition Say to yourselves first 'What have I done for my instruction?' and as you gradually advance 'What am I accomplishing?' until the time comes, when you may have the immense happiness of thinking that you have contributed in some way to the welfare and progress of mankind."

Plague and Streptomycin—Treatment in Indo-China

Soulaige *et al* treated 14 cases of bubonic plague with streptomycin and obtained completely satisfactory results in all cases. The dose was 0.5 gm. intramuscularly every 3 to 4 hours, the daily total being 3 to 4 grammes. This was continued till temperature fell and toxæmia was reduced; then a daily dose of 1 gm. in 4 divided doses was given. The total streptomycin should not exceed 15 g. Vascular collapse was counteracted by injections of cortical extract, 5 to 10 mg. daily. If bubo is already well formed, intravenous injections of Lugol's iodine hastened the resolution. — (*Med. Trop.*, 10, 537-548, 1950.)

OBSTETRICS AND GYNÆCOLOGY

Salpingoplasty using polyethylene tubing.—(*Am. Jour. Surg.*, Vol. 82, 2, Aug. 1951, pp. 280-282).

Wexler, Birnberg and Kohn of New York, describe a new procedure for restoring utero-salpingeal continuity. Briefly, it is the use of a polyethylene tube splint in connection with one of the standard uterosalpingostomy procedures. The difficulty with these standard procedures has been the relatively frequent formation of adhesions and later occlusions of the new ostium. Castallo experimenting with *Macacus rhesus* monkeys succeeded in establishing normal canalization and regeneration of the epithelium of the fallopian tubes by using polyethylene tubing. He suggested the possibility that this method might succeed in humans also. Polyethylene is a synthetic plastic which has been used for a number of years in many diverse conditions in the human body because of its non-reactivity with tissue. It is readily available as a translucent white flexible slightly elastic tubing. Along with this plastic tube splint the authors have also used an indwelling carbon dioxide insufflating apparatus at the time of operation. The details of the operation are given at length which is not very different from the usual procedure for salpingoplasty. The new procedure consisted in:—A piece of polyethylene tubing 9 inches long of 2.5 mm. diameter was threaded from the cut cornual end of the tube through the fimbriated end. The tubing was then manipulated through the ostium of the cornu down through the uterine body and through the cervix, the insufflating apparatus being removed at this time. The long ends of the sutures projecting through the anterior and posterior uterine walls are then tightened and tied on the serosal surfaces. This manoeuvre opens up the lips of the fish-mouth incision in the salpinx and secures an endosalpinx-to-endometrial junctions. The polyethylene tube

which has been previously sterilised in a 1:1000 solution of benzalkonium chloride is then adjusted so that about 1 inch projects from both the fimbriated end of the tube and the cervix. A fresh corpus luteum in the left ovary which was decapsulated and wedge-resected gave evidence of recent ovulation. The uterus suspended by application of the round ligaments and the abdomen is closed in layers without drainage.

Penicillin is given post-operatively for a few days. The patient operated on as above by the authors on 25th January 1951, was ambulatory *six hours* after operation. The post-operative course was uneventful and the patient was discharged on the 8th day. The polyethylene tubing was removed on the 12th day. This tubing which had been used for the primary purpose of splinting the new ostium and preventing adhesions also acted as a drain to draw off material which might conceivably have produced later adhesions. On 8th March 1951, a hystero-salpingogram showed patent tubes. Five insufflations of carbon dioxide showed graphically perfectly normal peristaltic waves with bilaterally open tubes. The ultimate outcome as far as pregnancy is concerned cannot be foretold yet; but it is hoped that success may be achieved to this end.

Treatment of acute puerperal mastitis.—(H. Close Hesseltime and H. D. Priddle. Chicago, Ill. *Am. J. Obst. and Gynec.*, 61: 1370-73, June 1951).

Acute puerperal suppurative mastitis has been greatly reduced in recent years by the early and proper use of penicillin therapy. A few reports in the literature, as early as 1945, indicated that the risk of suppurating mastitis could be greatly reduced. Our data for the year 1947-'48 revealed an abscess incidence percentage of 0.22 when 240,000 units of penicillin were given daily, yet from 1931-'47 this rate varied slightly, but averaged 0.51 per cent for those

14 years. For 1948-'49 the percentage was reduced to 0.12 per cent. During this year the penicillin dosage was more than doubled over the previous year by increasing it to 600,000 units daily. In 1949-'50 the dosage was increased to 900,000 to 1,200,000 units per day, depending upon the acuteness of the mastitis. In this year there were 3,931 mothers delivered with 35 instances of mastitis. Not one patient developed a suppurative lesion or had a persistent induration remain in the breast. The penicillin therapy ordinarily lasted four to six days. The only other therapy was complete rest to the breast, comfortable binders, and bed-rest. A complete protective prophylactic method against mastitis has not been developed. The education of the patient to report promptly any disease or trouble with the breast, along with immediate institution of penicillin therapy in 900,000 to 1,200,000 units, has done much to practically eliminate the formation of puerperal breast abscess. It is pointed out that the length of time following the first 12 hours of symptoms until therapy is instituted bears a direct relation to the failure-rate. This last dosage programme may seem excessive, but the excellent results obtained by the increased amount of penicillin leave no doubt of the therapeutic value.—(*Quarterly Review of Obstetrics and Gynecology*, Jan. 1952).

Rupture of the uterus.—Woodward D. Beacham and Dan W. Beacham, New Orleans, La. *Meet. Am. Assoc. Obst. Gynec. and Abdom. Surgeons.*, 61:141-57, Sept. 1950.

Perusal of 727 articles confirms the opinion that rupture of the pregnant uterus is a very serious accident and emphasizes the fact that, although much has been accomplished in prevention and treatment of ruptured uteri, the ultimate goal has not been attained as yet.

Ninety-six cases of rupture of the pregnant uterus has been managed at the New Orleans Charity hospital from January 1, 1913 to July 1, 1950, an incidence of 1:1328 deliveries. Forty-seven cases occurred during the past 12 years.

A study of these records and a review of the available literature reported since January 1, 1908 (459 caesarean and 1,269 non-caesarean cases) confirms the universally accepted opinion that uterine rupture is a very serious obstetric complication.

The high maternal (47.9 per cent) and even higher foetal mortality (79.6 per cent) in this and other large hospital series may be examined in part on the basis that complicated and mismanaged labours gravitate to institutional practice. Thirty-nine Charity hospital cases were designated as emergencies at the time of admittance. Forty-three of the foetuses were dead and five were non-viable when the mothers arrived at the hospital.

Each obstetric patient should have information concerning her blood group and RH status readily available at all times.

Every caesareanized individual is entitled to especially close supervision during each subsequent pregnancy, keeping in mind that a patient who has had one or more vaginal deliveries after section is not necessarily immune to rupture of the uterus.

Any evidence of shock during pregnancy, the intrapartum state, or following labour should call for a prompt consideration of the possibility of uterine rupture. The cervix uteri should be examined immediately after each delivery, and the lower uterine segment should be palpated after every difficult delivery or if there is any question as to extension of a cervical tear.

Successful management of rupture of the uterus requires alert evaluation of the situation and immediate therapeutic action. This series and a study of the reported cases substantiate the belief that prompt hysterectomy is the procedure of choice. Blood should be administered in adequate amounts to combat shock and replace that which is lost. Its rate of administration must be governed by the condition of the patient.

The residency system and blood bank have been the major factors in decreasing the maternal mortality from 61 to 12 per cent in our institution. Improved

facilities, including oxygen, chemotherapy, and antibiotics, must also be given due credit.

Better co-operation on the part of patients plus better obstetric judgement and technic will undoubtedly further reduce the incidence of rupture of the uterus.—*Quarterly Review of Obstetrics and Gynaecology*, Oct. 1951.

Fluorescence in gynaecology.—Annotation, *The Lancet*, 12-5-51.

The changes in the vulval skin in health and disease are far from fully understood. The studies of Benson and his colleagues in San Francisco (reported in *Surgery, Gynaecol. and Obstet.*, 1951, 92, 14.) have shown that fluorescence which is no new thing in medicine, can be utilised in gynaecology with advantage. Healthy hair and skin fluoresce very slightly under irradiation from the light of a mercury vapour lamp filtered through Wood's glass containing oxide of nickel. The finger nails however, glow more brightly and hairs infected with the small-spored ringworm give a brilliant green light.

The vulva is viewed by ultraviolet light that has passed through a complex system of filters. The fluorescence is seen in the colours which range from yellow before puberty, through green, to the light purple of the reproductive period and the deep purple of advanced pregnancy, which soon fades after delivery or if pregnancy is previously terminated. At the menopause the vulva fittingly turns autumnal brown. These appearances seem to reflect the activity or otherwise of the ovarian hormones. In bleeding states the vulva fluoresces bright red or orange, through the action of the porphyrins formed from the decomposition of haemoglobin which the day's ablutions have not removed.

A similar fluorescence due to porphyrins is observed on the tongue in healthy young people and tends to disappear in pernicious anaemia, sprue, vitamin B deficiencies, and old age; the porphyrins are formed by bacteria and disappear with local application of antibiotics.

Once caesarean, need not necessarily always be a caesarean.—(*Jour. Am. Med. Assoc.*, 145, 12, pp. 884-888).

The management of a patient who becomes pregnant subsequent to a caesarean section has been a matter of controversy for over a generation. "Once caesarean always a caesarean" is a favourite dictum with many obstetricians; but another group believes that under certain circumstances it is not only possible but also desirable and advantageous to allow such women to be delivered vaginally. The main point of contention between these 2 divergent groups rests on the potential danger of rupture of the uterus and the possibility of calamitous results to both the mother and baby if such rupture occurs. Dr. Cosgrove, Superintendent of the Margaret Hague Maternity Hospital, Jersey City, New Jersey, (U.S.A.) who does not subscribe to the dictum "once a caesarean always a caesarean," has conducted a careful study of the thousands of cases he has handled in his hospital. He does not believe that caesarean section is yet an entirely innocuous procedure. Vaginal delivery does not affect the fecundity of the mother to the same degree as repeated caesarean sections. Relating his basic experience, Cosgrove says "among mothers delivering over 117,000 live infants there have been 6 deaths in pregnancy subsequent to caesarean section. There were no deaths incident to vaginal delivery subsequent to a caesarean section and there were no maternal deaths due to rupture of the scar of a previous caesarean section." Of 500 patients seen with a pregnancy following an initial caesarean section 321 (64 per cent) had had caesarean section repeated one or more times with the delivery of 368 infants. 179 (35.8 per cent) of the patients seen after an initial section were allowed to deliver vaginally one or more times with the delivery of 221 infants. In his series, the average length of labour prior to the initial caesarean section was over 24 hours, and yet 27 per cent of these patients subsequently delivered by vagina after an average labour of only 13 hours. Cosgrove's basic philosophy of manage-

ment, therefore involves allowing patients with previous caesarean sections, to progress through pregnancy until the onset of natural labour. This ensures maturity of the fetus to the highest degree possible and averts the occasional detrimental effects of premature delivery caused by inaccurate menstrual history or faulty estimate of fetal size. This procedure was uniformly followed for all patients who delivered vaginally and for 178 patients who were subjected to repeated caesarean sections. It is

SURGERY

Conservative treatment of acute perforation of gastroduodenal ulcer.—(Scott E., *B.M.J.*, 675-677, 1951).

Acute perforation is a grave surgical emergency, which if left untreated, will cause death in most cases. Scott, has however, succeeded in treating a fairly large number of cases of unselected perforated gastroduodenal ulcer patients conservatively. The routine adopted by him was as follows:—

(1) Continuous suction by means of a Ryles' tube attached to a silent electric motor was maintained till the withdrawn fluid had been bile-stained for about six hours. Such staining is an indication that the pylorus is patent. The drainage should be carefully watched, as the Ryles' tube is apt to get blocked easily. Patency of the pylorus was established usually in 48 to 72 hours.

(2) Intravenous 5 glucose-saline was given. It may be that a hyalase drip would do as well.

(3) Morphine 1/6 grain six hourly for 3 doses is all that is required. The severe pain became easier in one to 2 hours after continuous suction was started. The rigidity had entirely disappeared after 24 hours but the generalized tenderness remained up to 48 hours.

(4) Chemotherapy: Penicillin 40 to 60,000 units were given 4 hourly. Sulphonamides were given to a few cases. The use of penicillin is of the utmost importance to prevent bacterial peritonitis.

(5) Deep breathing exercises.

(6) The patient is allowed to take sips of water from the beginning; this helps to keep the mouth moist and clean and also lessens the irritation from the Ryles' tube. When the tube is removed, diluted milk is given and gradually the usual ulcer diet is built up.

The patients under conservative treatment required less nursing attention; post-operative shock, post-anæsthetic complications, wound infection or incisional hernia are all avoided. There is no aggravation of the existing peritonitis or trauma of the peritoneum, stomach or duodenum.

Cosgrove's firm conclusion that under proper conditions patients who have had a caesarean section may be safely allowed to demonstrate their capacity to deliver vaginally subsequent to caesarean section, and that the section should be resorted to, only when vaginal delivery is not found possible. There were no maternal deaths from ruptures of previous caesarean section scars and six deaths incident to subsequent caesarean section.

From the follow up of the first series of 16 cases, 13 who were seen almost 12 months after perforation, were found to have improved greatly. The author reviews the literature on this conservative method, and concludes that immediate operative intervention in simple gastro-duodenal perforation is no longer necessary; and should be undertaken when serious complications arise.

Prolapse of the rectum.—(Proc. Royal Soc. Med., 42, 1905-16, 1951).

Wright and his coworkers discuss the merits and disadvantages of some 36 different methods of treatment which have been extensively employed in various countries and refer at length to the five which are extensively used in England (1) Excision of the pile area in cases in which the prolapse is simply mucous membrane; (2) the anal tightening operation of Thiersch for lesser degrees of true prolapse; (3) the ligature method over a rubber tube for strangulated cases; (4) the rectosigmoidectomy operation of Miles; and (5) the pelvic obliterating operation of Moschowitz.

The Thiersch operation is rapidly getting to be popular and gaining favour amongst leading surgeons. Operative mortality in all methods is low but the recurrence rate is high. The operation of rectosigmoidectomy probably interferes with the afferent fibres of rectal sensation. Lloyd Davis has achieved very good results by moving the rectum to the sacrospinous ligaments by sling sutures of non-absorbable material, at the same time fastening the rectum to the vagina by suit-

Postmortem examinations on air crash victims.—According to a recent report deaths could be reduced if passengers travelled facing toward the rear of the plane. After post-mortem examination of 28 victims of an air crash and fire, Teare concludes that in 16 the immediate cause of death was acute flexion of the body over the safety belt. The causes

of death include: fractured skull (10), fractured cervical spine (1), subarachnoid hemorrhage (1), and injuries to the chest and upper part of the abdomen (16), the latter including ruptured descending thoracic aorta (8).

There was no measurable concentration of carbon monoxide in the blood of 23 victims. The other five, who had 20% or less carbon monoxide in the blood, did not reveal evidence of burns in the internal air passages. This suggests that all 28 were dead or deeply unconscious before the outbreak of fire and that the fate of the occupants would have been the same had no fire occurred.

There was a remarkable similarity of injuries to seven pairs of victims who probably were sitting together. The stewardess, who was in the tail of the aircraft, escaped death. Such observations support the belief that certain parts of aircraft are more dangerous than others when a plane crashes.

With advances in foam-protected fuel tanks the danger of fire in air crashes will diminish and, as indicated by the findings in this study, the hazard might be further lessened by having the passengers seated facing backward.—(*Journal of the American Medical Association*).

Modern treatment of abscesses.—(Ellis, *M. Post-graduate Med Jour*, 28, 315, 3: Jan. 1952).

Recent work in Leeds shows that the granulation tissue round an abscess prevents the spread of infection from the abscess and also prevents antibiotics like penicillin getting into the abscess to overcome the infection. Once an abscess has formed it is of little or no use giving penicillin or other antibiotic. If, however, when the abscess is incised, the granulation tissue barrier is broken down by curetting gently, any penicillin in the blood can enter the abscess and overcome the infection.

It is now the universal practice in Leeds hospitals, to give a large dose of penicillin (600,000 units procaine penicillin mixed with 250,000 units aqueous, the most painless method) to wait half an hour and then carry out the incision. All pus is evacuated and the lining of the cavity curetted. It is then our aim to carry out primary suture of the wound; with hand infections, if the incision is made in a skin crease, suturing is unnecessary. With abscesses of the breast, axilla, face, neck and elsewhere, the skin edges are firmly opposed. In ischio-rectal abscesses sulphamide or streptomycin is used in conjunction with penicillin. One more indication of the antibiotic is given on the fourth day and the wound is inspected on the fourth day. Unless the organism is insensitive to penicillin, the wound will be healed all right. The most dramatic results have been achieved in ischio-rectal abscesses, where a long series of patients have returned to work in 6 or 7 days, instead of being in hospital for weeks together. A further extension of this principle is that it is unnecessary to wait for an ab-

cess to "point". Penicillin can deal with any contamination from a deep abscess. If the skin is devitalized by leaving the abscess to point, the stitches tend to cut out and the wound may gape.

It has thus been shown that the age-old method of treating an abscess by waiting for it to point, incising and leaving it to drain is now out of date. The modern method is to operate with a large amount of penicillin in the circulation, allow the penicillin to get into the abscess by breaking down the granulation tissue barrier evacuate the pus, sew up the wound and leave the penicillin to do its work.

Fractures of metatarsals and tarsals.—The 631 patients reviewed in this paper had 842 metatarsal and 62 tarsal fractures, a total of 904 fractures. The first metatarsal was the most frequently fractured metatarsal, and the navicular was the most frequently fractured tarsal bone. It is interesting that about half of the metatarsal fractures (422 of 842) and exactly half of the tarsal fractures (31 of 62) involved single bones. Prompt reduction is the most important step in treatment of fractures of the tarsals and metatarsals. Where the fracture is displaced or compound, an anæsthetic is indicated. Adequate fixation is imperative. In only a few instances was open reduction necessary and in only a few cases was the interposition of tissues found. The oblique fractures of metatarsal were most difficult to control during healing. These were most satisfactorily held by means of a stainless steel pin and a rubber band extension placed through the distal phalanx of the toe. In most simple fractures, union was affected in from four to eight weeks, except in cases in which there were complications, such as burns and crushed tissues, and in a few cases in which the patient did not fully follow instructions. In a few cases there was decalcification of the fractured bones. Arteriosclerosis, as evidenced by a pipstern posterior tibial artery, seemed to slow the healing process but did not stop it. Depending upon the amount of callus present, weight-bearing was allowed in an average of 8 to 12 weeks. In cases in which there was a delay or failure to restore normal alignment temporary or permanent disability resulted. Both the frequency and severity of fractures of the bones of the feet are less than they were 10 years ago, owing to intensive safety programmes and protective devices for the feet.—(*Journal of American Medical Association*).

An evaluation of five years' experience with vagotomy in treatment of chronic peptic ulcer.—The general enthusiasm which first greeted vagotomy a few years ago has abated considerably. It has become definitely limited in application in some clinics, and in others has been given up altogether. Moreover, the idea has become prevalent that the good results that followed its use were

due to the gastro-enterostomy with which it was usually accompanied.

In February, 1948, the authors of this paper had reported on a series of 101 patients who had been subjected to vagotomy. Now, three years later, the authors have again made a follow-up study on this same group of patients and on 13 additional cases who were subjected to vagotomy during 1948, 1949, and the early part of 1950. The addition of these 13 to the original 101 made a total of 114; but during these three years, a few of the nine patients originally classified as lost have been found, and a few others have gradually become lost; so that at the present writing, 14 are classified as lost and an even 100 patients remain, on whom this study of the results of therapy is based.

The authors feel that the following conclusions are justified:

(1) The evaluation of any surgical procedure is not an easy task, because some of the favourable or unfavourable complications may in some degree be attributable to other procedures used at the same time, such as gastro-enterostomy in conjunction with vagotomy.

(2) The wide variety of minor symptoms which in a fair percentage of instances temporarily follow resections of the vagus nerves may at times be due to other lesions in the alimentary tract or in the biliary tract; and this can be determined only by most thorough and painstaking examinations.

(3) While there is ample proof in this series that vagotomy is sufficient in itself to provide a permanently good result, it is believed that the combination of vagotomy with a well-performed gastro-enterostomy in well-chosen cases has a definite place, if performed

by a competent surgeon who has spent considerable time in the anatomy laboratory and at the autopsy table, familiarizing himself with the variations in the distribution of the vagus nerves.

(4) Vagotomy is by no means to be considered a substitute for gastric resection, which is a well-established procedure; but it should be seriously considered as an alternative method of treatment, carrying with it certainly a lower mortality, and offering results which at the moment seem comparable with those of gastric resection. In this series, there had been six gastro-enterostomies and seven resections performed previously to vagotomy, and all were associated with a stoma ulcer.

(5) Vagotomy is not considered advisable in the patient with chronic gastric ulcer unless the patient is in too poor a condition to warrant resection, and the lesion is lying high in the fundus or cardia and has been proved to be benign by biopsy.

(6) Vagotomy is especially indicated in treatment of stoma ulcers that have followed either gastro-enterostomy or gastric resection in which the element of obstruction is not a factor. It is to be especially recommended in those instances in which, because of the extreme degree of ulcerative change in the region of the first part of the duodenum a closure of the duodenum would be usually difficult or hazardous and resection, therefore, would be considered too great a risk.

(Miller, E. M., Knight, A., and Olwin J.H. *A.M.A. Archives of Surgery*, 63, 303-310, 1951. The authors are connected with the Veterans Administration Hospital, Hines, Illinois, and the Presbyterian Hospital Chicago, Illinois.)—*Surgical News Letter*.

MEDICINE AND THERAPEUTICS

Heartburn.—(*The Lancet*, 12-5 '51, p. 1072).

Eastwood writes "Heartburn is a troublesome symptom in some patients, so it may perhaps be worth recording that it usually responds to the administration of ferric ammonium citrate (gr. 5, in plenty of water, p.r.n.). Bismuth carbonate is also frequently effective. These observations suggest that heartburn may be caused by the presence of sulphides in the upper bowel. Ferric salts oxidise sulphides and bismuth salts form an insoluble precipitate of bismuth sulphide. *The National Formulary* "white mixtures" containing no bismuth, are ineffective in the treatment of heartburn.

Streptomycin in the treatment of infantile diarrhoea.—(*Polyclinic Infant.*, 16, 608-624. *Abst. World Med.*, May 1951).

Bulgarelli and Tolentino treated 46 cases of diarrhoea in infants ranging in age from 15 days to 17 months. Of the 13 infants aged 1 to 10 months treated by I. M. injection

tions of 40 mg. per kg. of body weight five did not respond. Of 5 infants (aged 2 to 10 months) treated by rectal administration of 50 to 80 mg. per kg. of body weight only two responded, and the infection in these was confined to the lower bowel.

The remaining 28 patients together with five of those that had failed to respond, were given the drug by mouth in 4 doses of 25 mg. per kg. of body weight daily with only one failure. Recovery took 3 to 6 days usually due to *B. coli*, *Proteus vulgaris*, or *P. morganii*, but some cases were secondary to otitis, broncho-pneumonia etc. Many of the infants showed signs of toxicity. The authors conclude that oral streptomycin is the treatment of choice in all forms of gastro-enteritis, that rectal administration should be used as an adjunct when only the lower bowel is involved, and that the intramuscular route should be reserved for cases showing septicaemia. Primary foci should receive appropriate treatment with penicillin or sulphonamides.

Carcinoma of the prostate gland.—(*Arch. Surgery*, Sep 1950).

Reynolds *et al* administered conservative treatment to 104 patients in whom the diagnosis of carcinoma of the prostate was clearly established. Diethylstilboestrol was given orally. The daily dose was 3 mg. or less at first, but was later increased to 5 mg during the last 5 years. This dosage was still further increased if symptoms warranted or if metastases became apparent. 56 of the 104 patients underwent transurethral resection for obstruction of the bladder-neck. Lack of response to oral anti-androgenic therapy was unusual and relapses were very few and were certainly not as common as popular opinion indicated. The average survival period for all patients from the time of treatment to the time of this study was nearly 3 years. 22 patients survived more than 5 years but 65 patients now living have been under treatment for less than 5 years. This suggests that the number surviving for more than 5 years will appreciably exceed 21 per cent in the future.

Boric acid poisoning.—The occurrence of boric acid poisoning is reported in a girl, aged 9 months, with a diaper rash, whose father sprinkled powdered boric acid freely on the diapers and the skin lesions. Her buttocks became excoriated and extremely shallow, a bright red confluent macular eruption developed. She vomited coffee-ground material and passed bloody stools. Temperature rose to 104.9 F. The patient was alternately semicomatose and comatose, responding intermittently to painful stimuli. A specimen of urine obtained by catheter contained 1.6 mg of boron per millilitre. Fluids and blood were given intravenously to combat the circulatory collapse and dehydration. Adrenal cortical extract was given because of the collapse and poor appearance of the infant. Penicillin and dihydrostreptomycin were administered because death had occurred from bronchopneumonia in some of the reported cases. The patient began having generalized twitching and sedation was used cautiously to control it. She died 26 hours after admission to the hospital. Necropsy revealed ulceration of the skin of the perineum, acute hemorrhagic enteritis, minimal ascites, cloudy swelling and central necrosis of the liver, and pulmonary congestion and desquamation of the epidermis and the hemorrhagic enteritis, the pathological findings could all be due to profound shock. Boron contents of urine and tissues were determined by spectrographic analysis; the amount of boron in brain, liver, kidney, heart, thymus, muscle, whole blood, and serum varied from 0.20 to 0.37 mg per gram of tissue. Boric acid and 0.37 mg per gram of tissue. Boric acid and sodium borate are sufficiently poisonous to cause severe symptoms and death when used in amounts commonly considered to be harmless. About 9 oz. (255 gm.) of powdered

boric acid were used in this case. Boric acid is readily absorbed by different routes and is particularly insidious, in that symptoms may be minimal until a lethal or a near lethal dose has been absorbed. The most characteristic findings are the gastrointestinal symptoms and the typical erythematous rash. In the more severely poisoned patient there is a shock-like picture and severe central nervous system involvement. The diagnosis may be further substantiated by the demonstration of boric acid in the urine. There is no known specific treatment for boric acid poisoning, and consequently treatment is symptomatic. —*Journal of American Medical Association*.

Complications of intravenous fluid therapy in child.—(Todd, R. M., *The Lancet*, 5-5-1951, pp. 982-985).

The occurrence of fatal generalised septicaemia in 3 infants who had had intravenous infusions prompted Todd to carry out a detailed investigation at Alder Hey Children's Hospital, Liverpool, to cover all patients who received I.V. fluid replacement therapy in 1949-50. The total number of I.V. infusions given was 664 some receiving up to 7 infusions. A standard regime of fluid replacement was followed in almost all the patients with diarrhoea and vomiting and in a majority of patients with other conditions, surgical and medical.

In this series of 664 I.V. infusions 132 complications were encountered. About 1 in 5 developed venous thrombosis or sepsis. The mortality due to these, was however small, but Todd stresses the need for avoiding them altogether by improving the technique or by using alternative procedures. Subcutaneous infusions are considered by some as a safer alternative to I.V. therapy, especially when given with hyaluronidase. In Todd's experience even with this procedure, the rate of absorption is too slow to restore the blood volume sufficiently rapidly in severely "shocked" infants. I.V. therapy is therefore essential in such cases and the alternative procedure of giving fluids I.V., whether into scalp veins, jugular veins or peripheral limb veins, by needle and syringe during the initial period of 'shock' is reasonable in practised hands. Todd considers this however, a difficult procedure and prefers setting up an infusion by the 'cut-down' method in which fever complications will arise if strict asepsis is not practised. Intramedullary tibial infusions are dangerous and liable to cause even more serious complications than I.V. infusions. In infants under six months of age, who refuse oral feeds for any length of time, proteins in the form of hydrolysates have to be given I.V. Even in a 2.5 per cent solution casein hydrolysate contributes materially to the onset of venous thrombosis but its use is nevertheless justified if it prevents liver damage. Because intravenous infusion wounds often become septic penicillin is administered as a routine to all patients by many workers. Todd however prefers streptomycin when an antibiotic is to be used as a routine.

Vitamin E in nervous disorders.—(*Jour. Nervous. Ment. Dis.*, Feb. 1951).

Stone describes his technique of treating diseases of the nervous system with vitamin E. For infants and children cold pressed wheat germ oil was given in a dosage of one to two cc. per 10 lbs. of body weight. For adults, natural mixed tocopherols were given in 50 mg. capsules, one to three daily. The author claims benefit in a variety of conditions. In the young it is used with advantage in selected cases of muscle hypotonia

and dysplasia, also after an attack of anterior poliomyelitis. In cases of congenital non-obstructive hydrocephalus, it effected arrest or slowing down of progression of head enlargement. A number of children with progressive hydrocephalus have developed normally after being treated with wheat germ oil for varying periods of time. Stone is of the opinion that it should be given a fair trial in all cases of amyotrophic lateral sclerosis in the female. Cases of *Tuberculosis* and multiple sclerosis were also benefited.

REVIEWS OF BOOKS, PERIODICALS AND REPORTS

Modern Treatment Year Book 1951—

Edited by SIR CECIL WAKELEY, 1951, pp. viii, 356 with 21 plates. Bailliere Tindall and Cox for the Medical Press 7 & 8, Henrietta Street, London. W.C. 2. Price: Sh. 17.6 net.

The whole field of medicine and surgery is covered in this volume giving all the progress in treatment and diagnosis made during the year.

There are about 39 contributions each written by men of experience in the subject dealt with, and as such their value cannot be questioned. Modern concept in the treatment of cancer of the stomach, keratoplastic, antibiotics, specially streptomycin its uses and limitations in the treatment, management of cardiac emergencies, modern trends in the treatment of pulmonary tuberculosis, the place of chest clinic in the tuberculosis service, modern trends in occupational therapy, are a few of the other useful subjects dealt with in this book.

Being a year book all the accepted modern concepts of diseases, their diagnoses and treatment are lucidly presented.

Busy practitioners will find this a useful book of reference in their practice.

Eye Manifestations of Internal Diseases (Medical Ophthalmology)—By I. S. TASSMAN, M.D., 1951, Third edition, pp. 672 with 279 illustrations including 25 in colour. St. Louis, The C. V. Mosby Co.

The arrangement and the general plan of this third edition have not undergone any change from its predecessors.

The first five chapters deal with the normal structure of the eye and orbit, general causes of eye manifestations, examination of the patient, structural abnormalities and manifestations and are intended for beginners and others not in touch with ophthalmology. Congenital malformations and anatomical defects of development as well as a description of the important hereditary and hereditary diseases are not dealt with.

In this third edition, the book has been revised, and rewritten where necessary to make the book up-to-date. Many new illustrations have been included. The subject of glaucoma has been rewritten to conform with the present day concept of the disease. Among the additions may be mentioned the chapter on Retrocentral fibroplasia; Harada's disease; Behcet's syndrome; rubella; acute anterior poliomyelitis; vascular encephalopathy; trigeminal syndrome; Sjogren's syndrome; Hutchinson's syndrome; malignant exophthalmos; cranial arteritis; scrub typhus; psychosomatic disorders; and pseudoexanthema elasticum. Appropriate treatment for most of the conditions have been mentioned. References for advanced and further study have been given wherever necessary at the end of chapters and will be found very useful by readers who may need them.

It is a well written book and we recommend it to every one practising ophthalmology and to the general practitioner, it will be found invaluable. We recommend it most heavily to all our readers and to medical libraries.

The Coimbatore Dt. Medical Association has brought out an Annual Number for 1951. It contains useful articles by prominent medical men dealing with such useful subjects as 'Viruses,' 'Family Planning,' 'Cancer of the Uterus,' 'Prevention of Tuberculosis' and 'Antibiotics in the Treatment of Venereal Diseases'. This issue also contains the annual report of the association for 1951 and gives a list of medical men both in private practice and in Government service in the Coimbatore District with their addresses.

The Coimbatore Branch of the Indian Medical Association which has produced this annual has to be congratulated on the excellent work it is doing and all its members deserve praise for the contributions they have made for the association and for their professional brethren.



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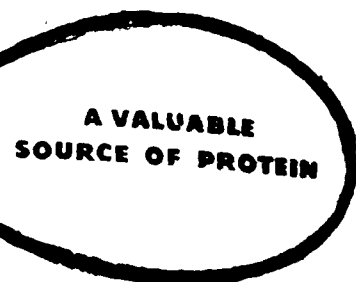
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Acetylarsan 10 amp. 3 cc. 6-0; 2 cc. 4-8 [1-10]	" " " 1400x5 gr. 44-0
Atebrin 3 gm. 2 2-4; 25 19-0; Antrutin 3 P.D.	Barley 1 lb. 9-8; 1 lb. 14-0 doz. [250 26-0]
Strepto M. or Pfizer 3-1; Glaxo 2-10 [17-8]	Sulphanilamide 500 5-0; 1000 9-12
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Calcii Gluco. 100 amp. 10 cc. 13-8; 5 cc. 11-8	Sulphadiazin 100 11-0; 500 42-12; 1000 82-0
" Sandoz 10x10 cc. 10-8; 5x10 cc. 6-8	Sulphamezathine 100 7-0; 500 31-0 [7-8]
" " 100x10 cc. 100-0; Cibazol 20 15-0	Veramon 20 2-12; 100 10-12; Yeast tab. 1000
Coramin 5 amp. 2-12; 20 amp. 10-0; 5 amp. 4-2	Glucovita or Dextrosol 4 oz. 9-4; 1 lb. doz. 23-0
Compolan 2 cc. 5 5-8; 25 25 25-12; 3x5 cc. 6-12	Cotton Wool 2-4; Lint lb. 4-0
Calcii Ostelin 15 cc. 3-4; 6x1 cc. 2-12; Combe	Bandages 1" 1-2; 2" 2-4; 3" 2-6
Santonine M&B dr. 11-8 [10 cc. 6-12]	Hypodermic Syringes, naked each in a box
Coramine liquid 15 cc. 3-12; 100 cc. 19-4; Vibax	2 5 10 20 30 50cc.
Euquinine 4-0; Roche oz. 4-6 [5 cc. 3-0]	" " " Sup. 1-0 1-10 2-4 3-8 5-8 6-8
Distilled Water 100 amp. 10 cc. 8-0; 5 cc. 6-0	" " " Ideal USA 5-10 7-4 9-12 11-0 13-8 22-0
Emetine Hyd. 1 gr. 12 4-4; 1 gr. 12 7-8	" " " L. Look Ideal 7-0 9-0 12-0 15-0 22-0 32-0
" " PD 6 amp. 1 gr. 6-12; 1 gr. 11-0	" " " B.D. 7-8 11-8 14-8 16-12 23-0 33-0
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Ephedrin Hyd. 1 gr. 1 cc. 100 amp. 9-12; 50 5-8	" " " Sep 2-8 3-8 5-0 7-12 11-0 16-0
Glucose Sol. 25% 25 cc. 100 amp. 20-0	for Side Nozzle Re. 1-0 more.
Milk 5 cc. 12 amp. 3-8; 50 amp. 9-8	Metal case Ind. 1-4; 1-12; 2-4 3-0 6-0
" with Iodine 5 cc. 12 amp. 4-8; 50 amp. 11-0	" " Japan 2-0 3-4 4-8 6-8 10-0 13-0
N.A.B. (M&B) 30 0-11; 45 0-13; 60 1-1	Baklite Casea 1-4 2-8 2-12
Neo Salvarsan 30 2-4; 45 2-8; 60 2-15	Hypodermic Needles, Stainless steel, dozen in a box.
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Quinine Bihyd. 10 gr. 2 cc. 100 amp.	Only Inj. Eng. 6-0 doz; USA Sup. 9-0 doz.
Ind. B.W. Evans P.D.	Saline Needle 2-0; Lumber Puncture 6-0
17-8 30-8 24-8 45-0	Baumanometer 120-0; Tyco 110-0; Erkometer
12-8 Eng. 19-0 5 gr. 100 amp.	Gripe Water 23-12; Waterbury Co 59-0 doz [65-0]
Stibatin concentrated 100 mg. 30 cc. 4-4	Diagnostic set 3004 102-0 3007 162-0
Vit. B ₁ 1 cc. 100 amp. 100 mg. 35-0; 50 mg. 24-0	Pneumothorax app. L & P. model Comp. 115-0
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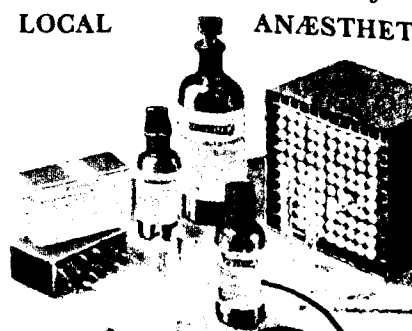
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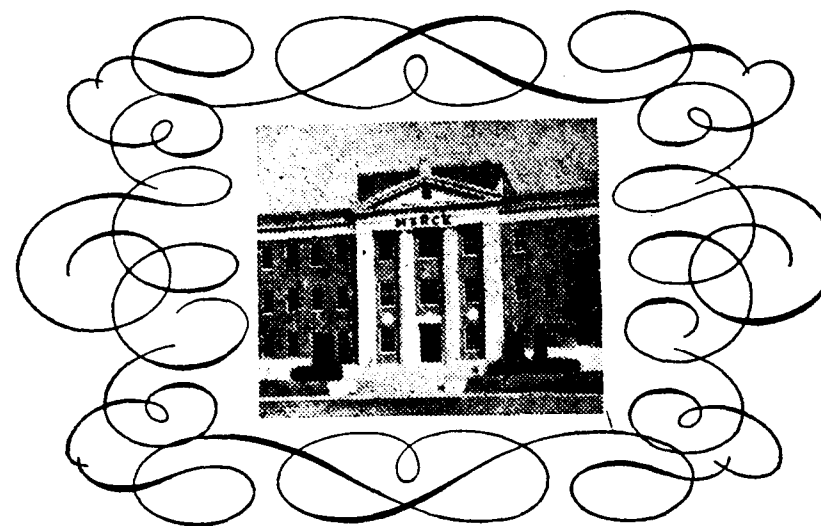
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- * Synergetic action thanks to the combination of PAS and Calcium.
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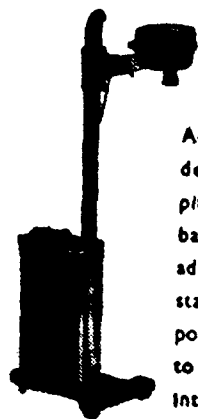
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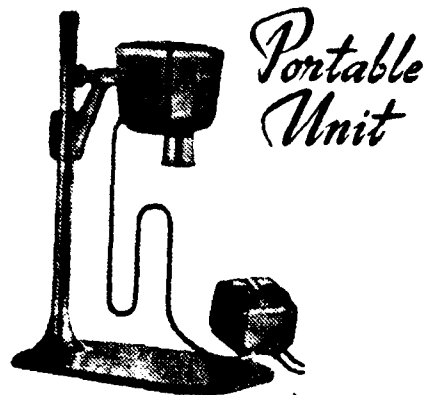
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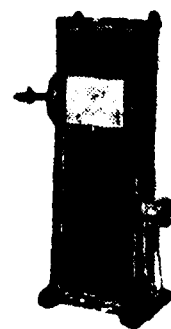
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Age 38—severe pains all over the body—no sleep—taking opium for relief falling off hair—anaemia—supratrochlears & cervical glands palpable—urine clear—WR & K negative, mapharside in calcium 6 injes. & mist iodide & HP for 1 1/2 months—no relief—pains from bad to worse—Rheumophan Compound treatment for 15 days completely relieved pains started walking about—treatment continued for a month—no relapse reported.

Case 7. NEURALGIA

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Age 70—tingling, numbness, shooting pains all over the body—for six months—shouting day and night—treated with a course of Vit-B₁ Iodide and Salicylate injections—pains continued—Rheumophan Compound treatment for about 3 weeks relieved all pains—could sleep—treatment continued for 3 months—discontinued since long—keeping well without relapse.

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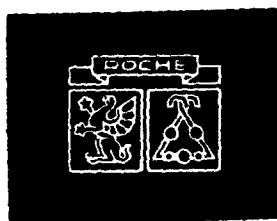
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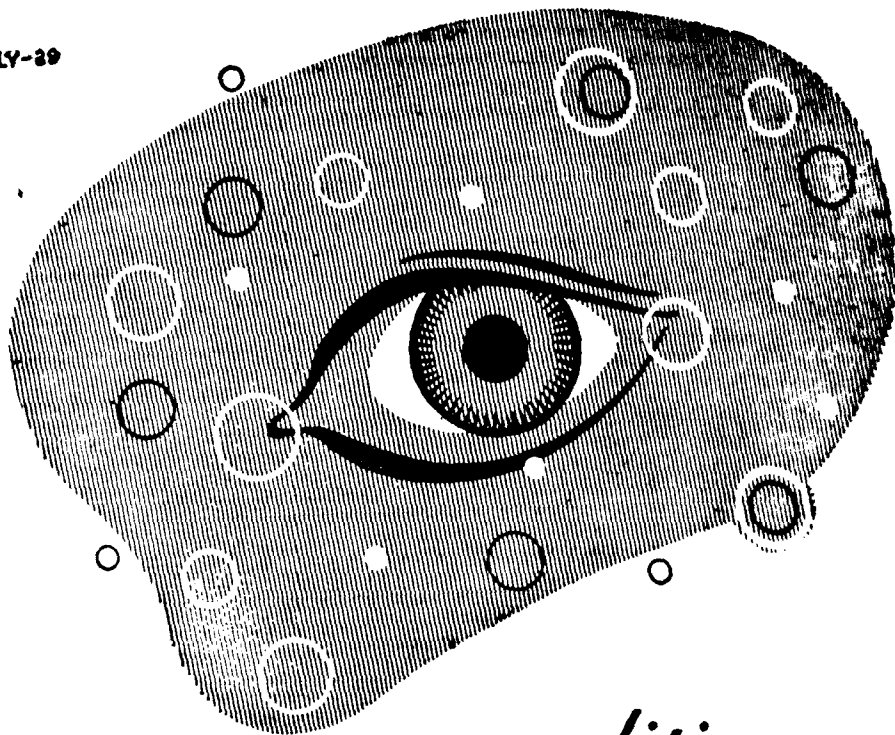
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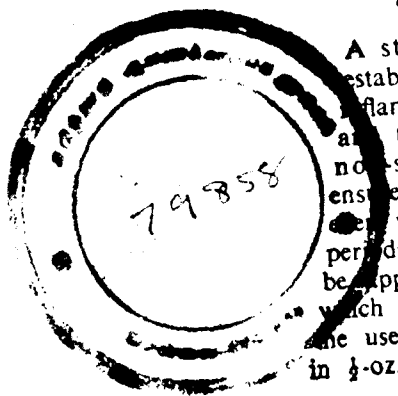
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Chloromycetin 12 Cap. 25-10	Merck H.T. Emetin 1 gr. orl gr. 3-12	First Aid Box 12-0 [case & clip 4-8]
Auramycin 8 Cap. 13-12	Sulpha Tab. 1000 500	B.W. Cal. Glu. 10% x 10 cc. 100 43-0
Tetracycline 8 Cap. 17-12; 16 34-0	nitro nido Eng. 9-8 5-0	Sander " " " 5 amps. 6-6
Gambito (Serp & Pen) 5-14	guinidine " 32-4 16-8	" " " 50 cc. x 10 10-8
P.J. Casagria Tab. 1-5; Conbec 10cc. 1-12	" ICI or BW 17-8	" 100 amp. 99-0 100 cc. x 20 22-0
Penicillin G Cryst. 1000 1000	thiazole Biotis — 17-0	Estroform 20's 2-14; 100's 11-8
1 2 5 10 100 1000	USA 33-8 —	Abs. Cotton 1-13; Lnt 3-12
0-11 0-11-6 1-2 2-0 Merck	Mezathine (100 6-12) 30-8	Abs. Gauze 14 yds x 25' 5-8
0-15 1-6 2-12 Pfizer	diazine MB — 49-8	" 6 yds. 4-8 doz. [per inch]
Dihydro Strepto 12grm. Glaxo 2-10	USA 77-8 —	Bandages 6 yds. x 1" to 6" 0-14
Merck USA Pfizer Merck P.D.	AFD 12-0 500 B.H. 500 43-8	Bandages 6 yds. x 3" JJ 4-0 doz.
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H.W. or A & H Glaxo Pf.	Sulphamids pld. 1 lb. 9-4	Stethoscope - pouche plastic 2-0
1-6 — —	cream 4 oz. Lilly 5-0 doz	Hypo. Syringe (S.N. Re. 1 more)
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3 lacs x 10 cc. Oily Pfizer 13-8	Emetine amps. B.H. 1 gr. x 12 7-8	0-10; 1-4; 2-8 4-0
100 tab. — —	1 gr. x 12 13-0	Italy 1-10 2-4 2-14 4-4 7-0
Penicillin Skin Oint. 1 lb. E. 0-11	1 gr. x 25 14-8	Germ. 1-2 1-8 2-8 3-4 6-12
Lozenges 27 1-2 (12 lacs) 1 gr.	Enlo 6 x 1 gr. 2-2	Record Ger. 3-8 5-1 6-8 10-0 13-8
Tab. 1 lac 12 4 8; 1 lac 8 9 5-0	P.D. 1 gr. x 6 6-10	" Comp. 6-4 9-0 11-4 —
P.A.S. Ducoex Bayer Italy India	1 gr. x 6 10-10	Boston 5-0 5-12 6-12 11-8 15-0
100 grm 10-6 12-8 1-14 6-4	Cibazol 250's 15-0; 20's 1-12	Italy 3-4 4-10 6-12 9-0 12-8
100 tab. — —	MB 710 37-0; MB 603 5-10's 11-0	B.D. Lock 7-0 10-0 12-0 15-0 20-0
Bayer 6 4; Italy 3-12	Liver Ext. 10cc 2 USP P.D. 3-12	Japan " 2-2 3-2 4-4 6-4 9-8
Italy 9-8; 500 18-0	" 5 USP P.D. 8-0	Italy M. case 1-2 1-8 2-0 2-8 —
Quinine Bazaral 45 S; Java 4-8	Oxyl 5 USP x 10cc Eng. 4-6	Indian " 1-10 2-10 3-0 4-8 5-12
Stand 1 42-0; H.W. 14 47-0	Liver Ext. & V. t. B. Comp. 10cc.	Metal case Ind. 50cc. 6-0; Jap.
oz Ind. 3-6; H.W. 14 3-12	10cc Biotis 3-0; [4-0	Backelite case 1-8 2-12 3-0 —
Bihydro 5-8; Hydro 5-4	Campolan 5x2cc. 5-9 25x2cc. 25-12	Hypo Syringe 50 cc. S.N. [12-8
Q. Bihydro Amps. 10x1 10x2 1 gr.	Cal. Glu. 10% x 10 cc. 100 16-0	Jap. 6-0; Italy 10-8; Germ. 9-4
Ind. Evans B.H. B.W. P.D.	Glucose Sol. 25% x 25cc. x 100 24-8	B.D. Lock 28-8; Jap. 16-0
17-8 24-8 24-12 3-0 43-0	Milk with Iodine 100 x 5 cc. 16-0	Record Ger. 23-0; Italy 16-8
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Roche 4-4; do. 1-4	Citotropine V.I.M. Ger. 5-8 & Eng.	2-8 3-12 4-4 5-0 oz.
Q. Tab. 2grx 100 2-2; 5gr 4-0 How	Atrophanyl I.V. 10-1; I.M. 11-8 [5-0	All Glass Needles
5 gr. 1400 How. 12-0	Barin 25 mg. x 10cc. 2-8 50 mg. 3-8	Jap. Ger. D.B. B.D.
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Asparine Eng. 5-8	Neosalvarsan 0-15 30 45 60grm.	Aletis Cordial Eng. 6-8; [mg. 20-0
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Quinacrine MB 12-12; 7-0	Acetelarsol Adult 5-12; Child 4-4	Camphor-in-Oil 3 gr. x 1 cc. x 100
USA. 5000 50-0; tin 100 10-4	Atebrine Bayer 15 0-12; 300 8-10;	Amyly Nit. Cap. 2-8 [Cipla 3-12
Ephedrin 1 gr. Ind. 9-0; 1-10	PD Adrenalin oil 3-6 [1000 19 0	Nicotinamide 50 mg. 100 x 1 cc.
Eng. 12-0; 100 1-14	Pituitrin 6x1cc. 11-2 1/2 cc. 8-2 PD	W. Gripe Water 22-8 doz. [B.W. 20-0
Yeast Tab. Eng. 7-8; 100 1-4	Distil Water 100 x 5 cc. 6-0;	Omnopon Amps with Needle
Soda Mint " 2-2; 100 0-12	10 cc 7-8; 2 cc. 5-8	Nivaquin 10 1-12 [Tube 1-0
Paludrin 1000 x 1 gr. x 25-12	Sil Vit. Eng. 3-4; Protargol 2-4	F.L. Durex Tin. 3-0 doz. Pkt. 2-0
3 grm x 500 25-12; 496 27-8	Ethyl Chl. 100grm. German 2-8	Ear, Metal Syringe 2oz. 6-0;
Aminophyllin Tab. 25 2-0 100 5-0	Sodaly 4 12 lb. Santaline dr. 8-8	Waterbury Co. 5-0 bot. [4 oz. 7-0
Amps. 6x2cc. 5-2; 6x10cc. 6-0	Thermometer Germ. 1-1; Jap. 6-11;	Vit. B12 Glaxo 20 mic. 6x1cc. 4-4
Digoxin tab. 25 1-12; 100 4-8; 500	Zeal 2-6 USA 1-5; Eng. 1-7;	" 50 mic. x 6 lcc. 7-2; 5cc. 5-8
Ext Ergot Ind. BP. 8-4; 4 oz. [17-8	Hicks 4-0; Vibronawine 10-12	Vitamin K. amp. 100 B.W. 22-0
Phenobarbiton Tab. B.D. H. 1000x1gr.	B.D. Stethoscopes 21-8; Ger. 10-0	Normal Saline 100 x 5cc. 9-12
Saridon tab. 10 1-7; 250 25-12 [14-0	Plastic tubing 1-12; Rubber 0-12 yd	Oil Chinopodium oz. 7-8 [10cc. 13-8
Potas Chloras 1 lb. 4-0; tab. 500 4-0	Erkameter 65-0; Aspirin 4-14 lb.	B.P. Blade 3-0; Handle 3-12
B.W. Morphia Sulph c Atro. 20 x	Detecto Weighing Machin: 38-0	Rubber Gloves 7 1/2" or 8" 1-0
Entelaz 8-0 [1gr. 5-0	Saline Appar. comp 300cc. 8-0	Merck Grape Sugar 20% 20cc.
Ind. M.S. 4grx 20 2-8; 5 amps 5-12	Winoarnis large 15-8 Manola 10-0	Vaginal Douche 3-12 each [x 5 6-5

Morphia Tartarate Amp. Squibbs 5 x 1-5 cc. x 1/2 gr. 0-10 box.

CLY-29



eye conditions....



A stable colloidal silver suspension of established importance in the treatment of inflammatory conditions of the eye, ear, nose and throat. The unique non-irritant and non-staining properties of the solution ensure perfect safety to all epithelial tissue when used frequently and for long periods. In the eye Collosol Argentum may be applied every half hour with results which often surpass those obtainable by the use of stronger preparations. Issued in ½-oz. bottles with dropping pipette.

COLLOSOL **ARGENTUM** OPTHALMIC

COLLOSOL CUPRUM OPTHALMIC AND COLLOSOL MERCUROCHROME OPTHALMIC

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STANDARDIZED EXTRACT OF RAUWOLFIA SERPENTINA

- REDUCES HIGH BLOOD-PRESSURE
- ACTS AS A SEDATIVE TO NERVOUS SYSTEM
- USEFUL IN INSOMNIA, EPILEPSY ETC.
- INDICATED IN MENTAL DISORDERS OF MANIACAL TYPE.

Supplies : Liquid Extract : In one ounce phials.
Tablets of 5 grs. In bottles of fifty.

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FAILURE

The **MODERN**
ANALEPTIC
NIKARDIN

NIKETHAMIDE B. P.
25% Solution

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Boxes of 6 ampoules of 2 c.c.
also

Phials of 15 c.c. for oral use.



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