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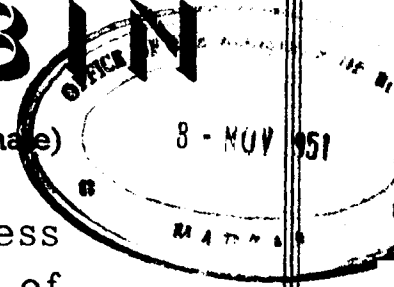
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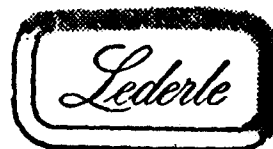
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- 1) Ruiz Reyes, F.; Muñoz, A. T., and Garcia, L. C.: Rev. de Paludismo y med. trop. 2:35 (March 31) 1950.
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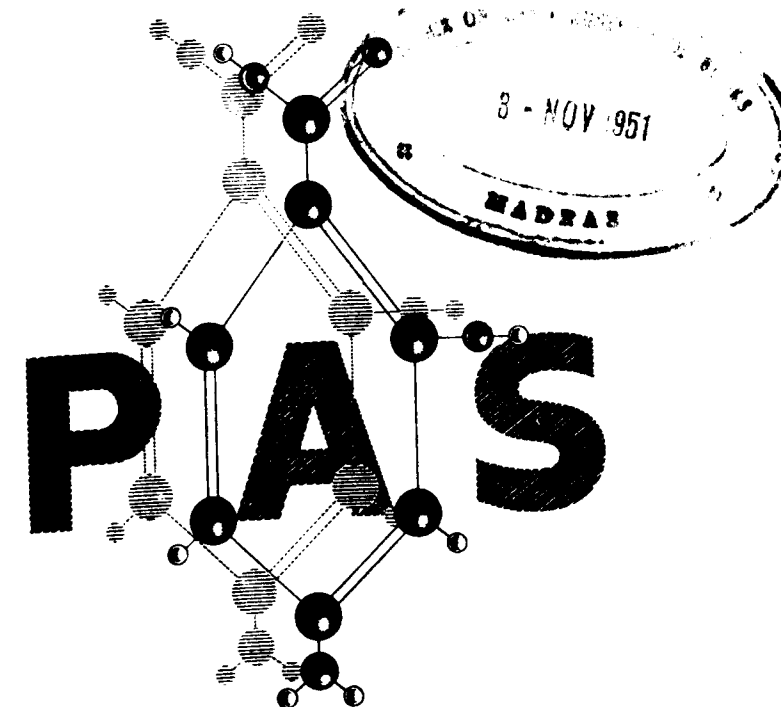
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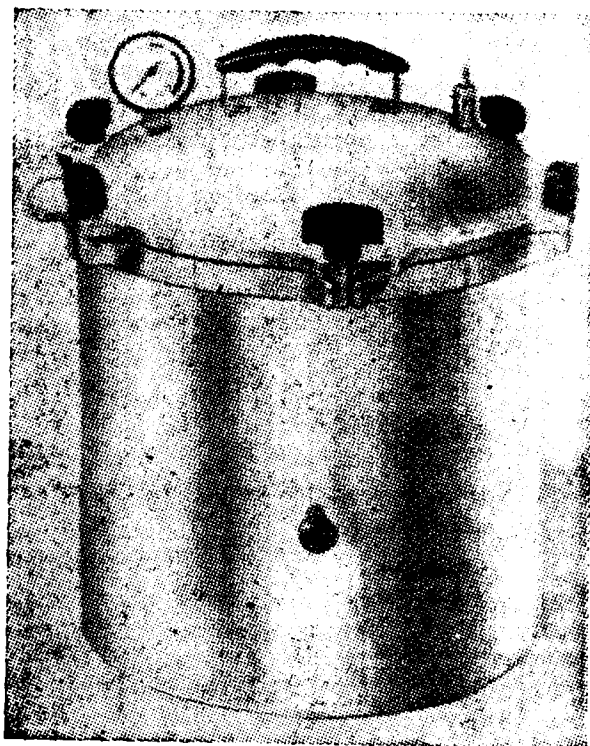
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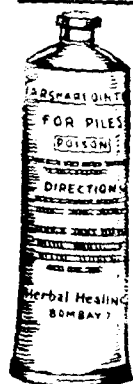
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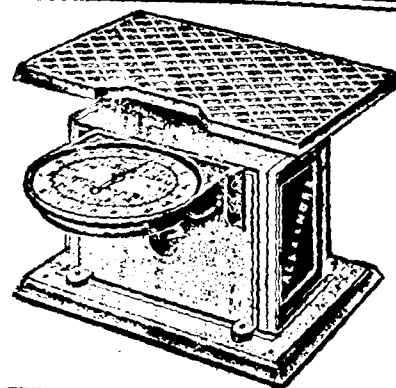
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Calcium Gluconate	10%
Whole liver extract (with anti-anæmic principles) obtained from fresh young healthy sheep's liver equivalent to	150 gm.
Choline Chloride	1/6 gr.
Thiamine hydrochloride (Vitamin B ₁)	2.5 mgm.
Riboflavin (Vitamin B ₂)	0.30 mgm.
Ascorbic Acid (Vitamin C)	10 mgm.
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CALCIYIMIN containing both Calcium and Vitamin 'C' in ONE—100 mg. of Vitamin C in 312.5 mg. of Cal. Gluconate 5 c.c.

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Each 5 c.c. ampoule contains:—8% solution of calcium Gluconate.

Vit. B₁ (Thiamin Hydrochloride) 30 mgm.
Nicotinamide ... 20 mgm.
Vitamin C ... 30 mgm.
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Indications:

1. Tuberculosis in all its manifestations and in all pre-tubercular stages.
2. Bronchitis, Bronchopneumonia, Pleurisy, Asthma etc.
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Massive Iron therapy

Each fluid ounce contains:—

Ferri et ammon citrate ... 60 grs.
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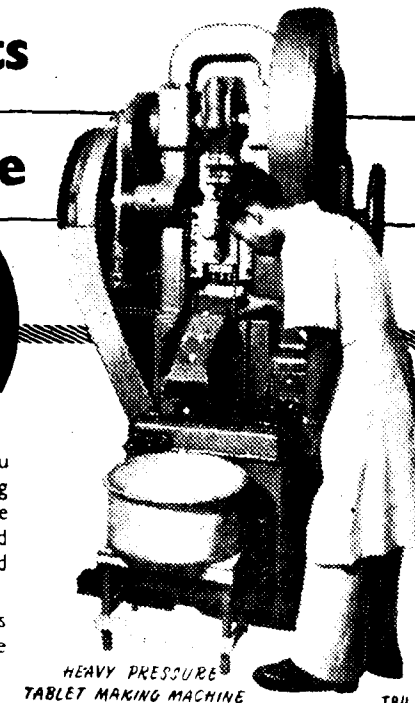
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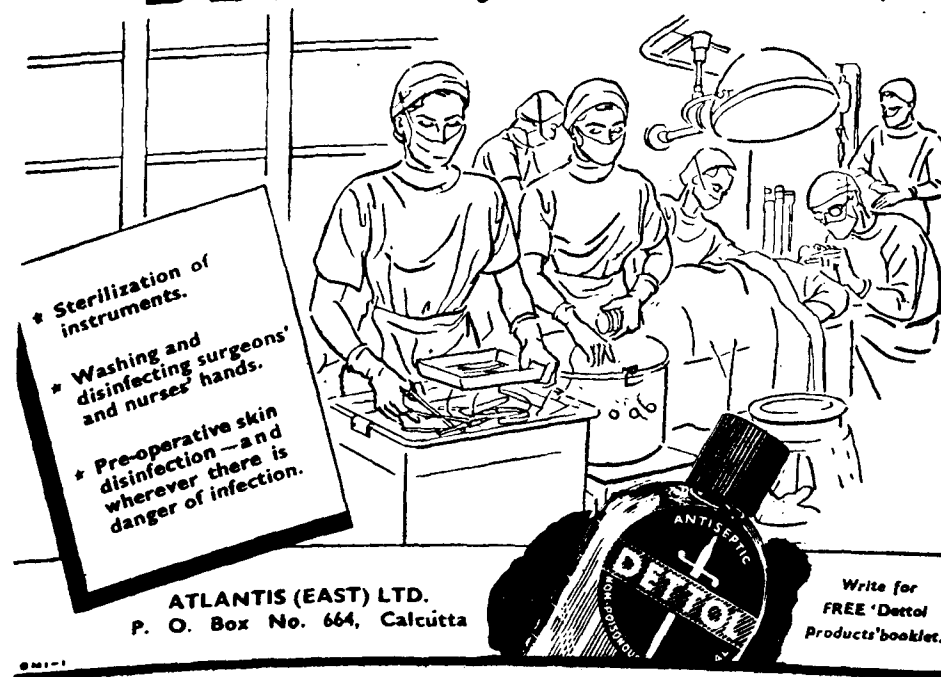
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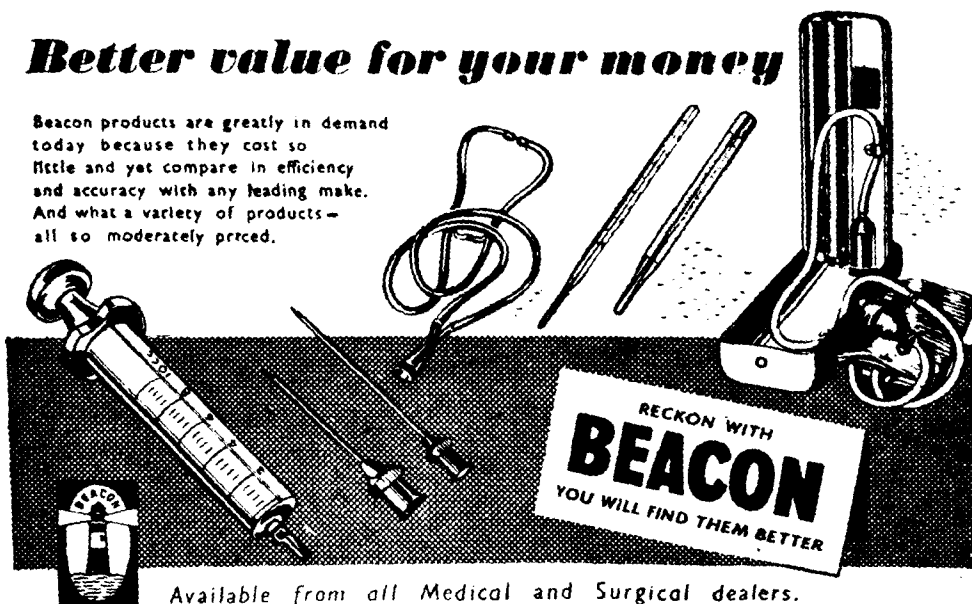
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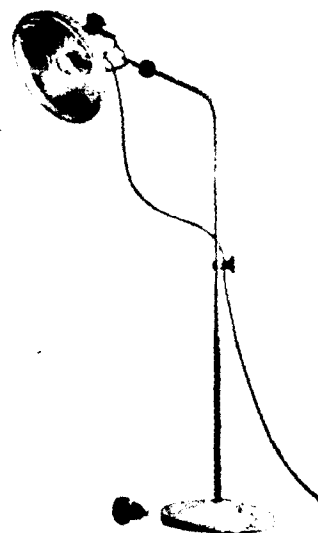
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B-FOLIN

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**Folic acid with Liver
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Each tablet contains :

Folic Acid Conc.	..	5	M. Gms.
Vit. B ₁	..	5	"
Vit. B ₂	..	1	M. Gm
Vit. B ₆	..	0.2	"
Nicotinic Acid	..	20	M. Gms.
Liver Conc.	..	45	"

**Indicated in all types of
Macrocytic anaemia,
Vit. B Deficiency and Sprue.**

Procurable everywhere from all the leading Chemists or apply to Manufacturers

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The Folic acid concentrate which is added to this product is obtained from fresh liver. The concentrate contains Folic Acid in the free as well as in the conjugated forms. In addition to this, the Folic Acid concentrate is also rich in all the other compounds of the Pterine class which play an important role in blood regeneration.

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COMPOSITION:

(for ADCO'S Compound with Vitamins)
Vitamin A 10,000 I.U.
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Vitamin B₁ 1,332 "
Vitamin C 1,000 "
Folic Acid 2 mg.

In a vehicle composed of enzymotically digested products of codliver oil, liver and spleen 30 p.c. Unfermented malt extract 10 p.c. Glucose 5 p.c. Hypophosphites of Sodium and Potassium solution (5 p.c.) 25 p.c. Extracts from wild cherry, Getian Vasic, Glycerrhiza, Eucalyptus 10%, Papain 1 p.c. Aromatics & Carminatives to make 100.

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A Vitaminised Enzymatic Digestant

Each fluid ounce contains:

Papain	24 grs.
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Vitamin B ₁	12 mg.
Vitamin B ₂	12 mg.
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Nicotinic Acid	20 mg.
Alcohol	23 t. V/V

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Granules

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INDICATIONS: "Di-Calcii-Plex" regularly administered during pregnancy and lactation, provides adequate calcium, phosphorus, iron, Vitamin B Complex and Vitamin D. for perfect nutrition. It can be regularly administered to children for prevention of Rickets, Dental caries, retarded growth. "Di-Calcii-Plex" is also useful in the treatment of debility, neurasthenia, haemorrhages, Tubercular diseases and Tetany.

COMPOSITION.

Each teaspoonful (5 G.) contains:

Calcium Phosphate	0.25 G.
Carbonate	0.25 G.
et Sod. Lactate	0.5 G.
Magnesium Hydrate	0.25 G.
Ferrous Sulph.	10 mg.
Calciferol (Vitamin D)	1,000 i. u.
Thiamine Hydrochloride	8 mg.
Riboflavin	2 mg.
Nicotinamide	50 mg.
Calcium Pantothenate	5 mg.
Pyridoxine Hydrochloride	0.25 mg.
Vitamin C	75 mg.

with Copper, Manganese and Cobalt in traces, in a flavoured sucrose base.

**A CALCIUM VITAMINS
B, C, D AND IRON
PREPARATION**

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* Wincarnis is a blend of pure, matured red wines, strengthening elements and malt extract.

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(1-diethyl-carbamyl-4-methyl-piperazine citrate)

Remarkable for the Treatment of Filariasis and only slightly Toxic

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CARBILAZINE U. C. B. taken in the proportion of 2 mgm/kgm. three times a day during 3 or 4 weeks causes the microfilariae of the peripheral blood to disappear within 2 or 3 days in most cases. Subjective sensations (pain, neuralgia, pruritus) usually disappear almost immediately.

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CARBILAZINE U. C. B. taken in the same proportion as above causes the microfilariae to disappear within 48 hours.

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CARBILAZINE U. C. B. given always in the same proportion as above shows the same efficiency against the microfilariae of loa-loa:

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Best tolerated, least toxic

Longer lasting effect (up to 8 hours)

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'U.C.B.'



The essential Amino Acid—in easily absorbed tablets of 0.5 gm.

INDICATIONS

1. Fatty degeneration of the liver due to unbalanced diet.
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Specifics for Syphilis and Yaws

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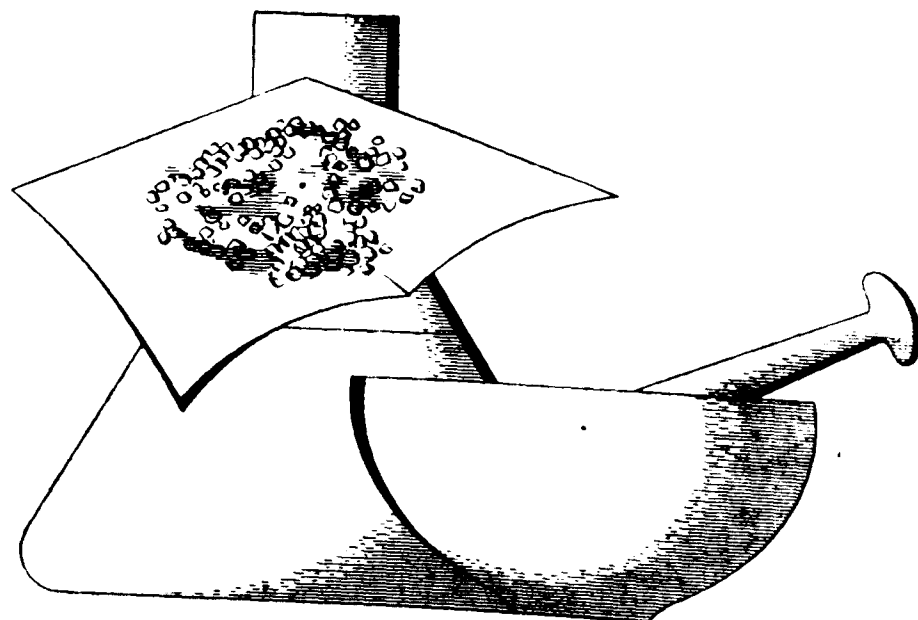
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Original Articles

AUREOMYCIN: A NEW ANTIBIOTIC

With a Special Reference to Its Action on
Shigella (Dysenteric Group of Organisms)

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Introduction.—"Of all the new antibiotics isolated to supplement the deficiencies of Penicillin and Streptomycin, Aureomycin, at present seems the most promising." Editorial—*Annals of Internal Medicine*, July 1949.

A continued search by microbiologists for other agents that will widen the attack on human infections, resulted in the discovery of Aureomycin by Dr. Duggar of Lederle Laboratories Division of American Cyanamid Company. Discovered in the wake of Penicillin and Streptomycin, this new antibiotic gives promise of being one of the most versatile yet discovered.

Out of 5,500 strains of mould that were grown from the soil fungi Dr. Duggar found the golden yellow mould of *Streptomyces aureofaciens* which yielded Aureomycin.

Preliminary clinical trials of the drug were reported before the section on Biology of the New York Academy of Sciences in July 1948. As soon as it was introduced to the medical world, with zeal and enthusiasm, it was put up for laboratory investigations and clinical trials.

* Specially contributed to THE ANTISEPTIC.

The wide range of the antibacterial activity of this new and potent drug has been demonstrated by several groups of laboratory investigators. Soon, it was established by Long and his associates in Baltimore, and Finland and his group in Boston, that encouraging results followed the use of Aureomycin in human diseases. Among the other workers, Price, Chandle, Bryer, Paine and Meads have reported on the activity of Aureomycin against a variety of gram-negative and gram-positive organisms. Its effectiveness against experimental infections in animals has been shown by Little, Bryer and others. Its place in the treatment of venereal diseases is well established. It is the one drug which has a safe and effective action against the five chief venereal diseases. Heilman found Aureomycin to be effective in the treatment of experimental relapsing fevers and Leptospirosis in mice.

Olshalter and co-workers have used Aureomycin with favourable results in pneumonias, both of bacterial and viral origin.

The most striking effect of Aureomycin, and the one which has been most instrumental in stimulating interest in this antibiotic, however, is its marked therapeutic activity against infections with all the known and available rickettsias and the viruses of the psittacosis—Lymphogranuloma venereum group in the embryonated hens' eggs, mice and guinea-pigs. Harrel, Meads and Stevens state that Aureomycin is rickettsiostatic because of its property of penetrating the host cell membrane and attacking the rickettsia and inhibiting the growth and reproduction of the parasites.

Barley and Saunders found that Aureomycin solutions were therapeutically active when used topically in the eye, and reported healing successfully a variety of bacterial and viral ocular infections.

Aureomycin as an amoebicide has been extensively tried and has been found as a most potent drug against acute amoebiasis. Experimental study of Aureomycin on *Plasmodium Gallinacium* in chick, suggests its usefulness as an anti-malarial drug.

During the course of these three years, extensive literature has accumulated and the drug has been tried both *in vitro* and *in vivo* on all types of pathogenic bacteria and viruses. Studies of Beinhauser and Gibson and Douling Lepper suggest its usefulness in eczema vaccina, varicella, herpes zoster, herpes labialis, herpes stomatitis, kaposi varicelliform eruptions, acute infective hepatitis and mumps, demonstrating its wide viricidal action on a variety of viruses.

The almost uniformly favourable tenor of nearly 500 articles published so far is remarkable, and the range of therapeutic indications extensive, with a few minor drawbacks, that all the investigators confirm the potency and unequalled versatility of this new antibiotic. Indeed its low toxicity and its effectiveness, when used orally or topically, makes this drug the most safe weapon to deal with the various infections. Unlike Streptomycin and Penicillin it

has additional advantage of showing little tendency to drug resistance or permitting to drug-resistant strains.

In spite of the enormous literature, it is strange to note that only two papers were published on the action of Aureomycin on *Shigella* (dysenteric group of organisms). It was this paucity of literature on this aspect and the prompt and dramatic effect of Aureomycin in a case of acute bacillary dysentery that prompted me to investigate its action on dysentery bacilli.

Chemistry.—Aureomycin is derived from a strain of *Streptomyces aureofaciens* and is supplied as yellow crystalline Hydrochloride salt in enteric-proof gelatine capsules. It is also supplied in injection form for parenteral use, and as a Borate for topical purposes. It has a molecular weight of 508, and contains Carbon, Hydrogen, Nitrogen, Oxygen and non-ionic Chlorine. It is highly stable in dry crystalline form and also in high concentration in acid solutions. It loses its activity rapidly in dilute solutions unless kept at 20°C.

It is soluble in distilled water (18 mgm. per ml) at an optimum temperature of 80°C. It is somewhat less soluble in Isotonic Sodium Chloride solution. The solution is acidic with pH 4.5. It is somewhat less soluble at pH 7.0. The activity of the antibiotic deteriorates in colour with a fluorescent tinge and a thin scum on the surface. Too much shaking of the solution loses its stability and potency due to the inactivation by an air-water interference induced by rapid shaking. Sometimes, traces of organic impurities or heavy metals in the water used, may bring down its activity. Solutions of 2 mgm. per ml in distilled water have retained their activity for over 2 weeks at 4°C. and for 4 days 37°C. The potency of Aureomycin in blood agar, gelatine plasma and broth deteriorates due to their alkaline reaction.

Pharmacology.—Aureomycin is easily absorbed when given orally or by other routes including the rectal. Aureomycin passes readily into the blood stream maintaining a measurable serum level as long as 12 hours. It also passes into the cerebrospinal fluid, peritoneal and pleural fluids, bile and milk, indicating a wide diffusion throughout all the body fluids. It has been found in the liver, kidney, lungs, spleen, and can probably diffuse through the placenta to enter the foetal circulation.

It rapidly passes in the urine in high concentration and can be detected for as long as 35 hours after a single oral dose of 0.5 gm. to 0.75 gm. The greatest excretion occurs between 4–8 hours after the administration of the drug. About 1/8 of a single oral dose can be recovered in the urine. Doses of 5–10 mgm. per kilo weight or roughly 500 mgm. for normal adults given orally at 6 hourly intervals ensures the persistence of measurable blood levels reaching up to an average of 2 microgrammes per ml (0.6–2.5 ug.)

Parenteral route of administration is painful and the tissue reaction great due to high acidity.

Several cases of thrombophlebitis are reported among patients receiving Aureomycin intravenously but usually subsiding quickly without residual effects. The present glycine diluent is believed to lessen the likelihood of such occurrences. However, intravenous route is not the choice of administration of Aureomycin.

In a concentration of 0.5% Aureomycin Borate does not irritate the conjunctiva.

Toxicity of Aureomycin is very low. Occasionally some degree of nausea, vomiting or diarrhoea has been reported particularly in ambulatory patients, although it has rarely been necessary to discontinue the drug on this account. Improved production methods have reduced these effects to a minor importance. No untoward changes are found in the blood, bone marrow, liver, kidney and central nervous system due to Aureomycin therapy. Allergy to Aureomycin is minimal. When Aureomycin is administered orally over long periods, the effect on the normal intestinal flora may lead to interference with the normal synthesis of vitamins.

Oral dose:—Accepted dose is 25 mgm. per kilo of body weight every 24 hours, divided into 4 equal doses or 500 mgms. (2250 mgm. capsules) every six hours for average adults. Full dosage should be continued for 1-2 days after the symptoms have come to normal.

Parenteral dosage:—Aureomycin is given intravenously in doses of 500 mgm. twice daily. This dose may be adjusted upwards to as much as 500 mgm. every 6 hours according to the severity of the infection. Not less than 10 cc. of diluent should be employed for each 100 mgm. of Aureomycin. Solutions should be prepared immediately before use. Approximately 5 minutes must be required for injecting each 10 ml. Intravenous therapy should only be employed in emergency for hospitalized patients who are in a moribund condition. Because of the possibilities of the thrombophlebitis at the site of injection, intravenous therapy should be discontinued as soon as the patients can take Aureomycin orally.

Ophthalmic dosage:—In ocular infections, Aureomycin may be applied locally in the form of 0.5% solution of Aureomycin Borate, 1-2 drops being placed in both eyes every 2 hours or oftener according to the severity of the infection. Aureomycin Borate is also available in ointment form for ocular therapy.

Bacteriology.—In the course of these three years, Aureomycin has been tested on a variety of pathogenic bacteria and viruses, and yet the reports on the action of Aureomycin on shigella (dysenteric bacilli) are very few and inconclusive.

Experimentally Aureomycin has been found to act *in vitro* as a bacteriostatic and at high concentration as a bactericide against a variety of gram negative and gram positive bacteria. One of the organisms which is resistant is proteus vulgaris which is used as a control organism in my experiments.

In vitro, activity of the antibiotic increases with the concentration and diminishes with the increasing number of exposed bacteria. Aureomycin is effective only against vigorously multiplying organisms but not on fully developed or on resting cultures. It is much more active in acid than in alkaline medium. Filtration of the solution does not reduce the activity. There is no significant tendency for the development of resistant strains to Aureomycin and is a contrast to Streptomycin and Penicillin.

Some substances, like Cystine, Semicarbazide and other constituents of culture media like sugars and salts, which have been shown to interfere with the action of Streptomycin, do not seem to have any such effect on Aureomycin activity.

The number of organisms susceptible to Aureomycin is steadily increasing. To mention a few and briefly, it has a definite action on all pyogenic organisms (except proteus vulgaris). It has favourable results on all the five venereal diseases. Its role in the treatment of pneumonias, both bacterial and viral, is well established. As an antibiotic with low toxicity it outbeats other drugs in the treatment of salmonella infections. Its usefulness against rickettsial infections is proved. No other antibiotic has such powerful action as Aureomycin on a variety of viruses.

Tests for sensitivity for Aureomycin are carried out chiefly by surface streak method on agar plates containing various concentration of antibiotics and by the Bondi's disc method. In these investigations the latter method is adopted.

Serial dilution method has certain practical difficulties but with proper technique it is a delicate method for bio-assaying the antibiotic.

The present investigations were carried out *in vitro* on the strength of its beneficial effects in 4 cases of bacillary dysentery which were resistant to Sulphaguanidine and Thalazole and which responded promptly to Aureomycin therapy. In all these cases, motion cultures were made before and after treatment and dysentery bacilli were isolated and their sensitivity tested against Aureomycin.

Procedure adopted.—Aureomycin sensitivity tested by Bondi's disc technique:—Fig. 1 (*vide page 794*). 15 mgms. of crystalline Aureomycin are accurately weighed out and transferred to sterile corked test tube and dissolved in 10 ml of sterile distilled water. It is used as a stock solution and is stored in the frigidaire at 20°C.

Discs of 5 mm. are punched out from the filter paper (Whatman) and sterilized in a petridish.

For working solution 1 part of the stock solution is diluted with nine parts of the distilled to give 150 mgm (microgram) per ml. This is freshly prepared before each experiment is conducted.

The pathogenic organism isolated from the faeces is inoculated in the sterile broth and incubated at 37 C. for 24 hours.

A loopful of the 24 hour broth culture is streaked on the sterile McConkey plate.

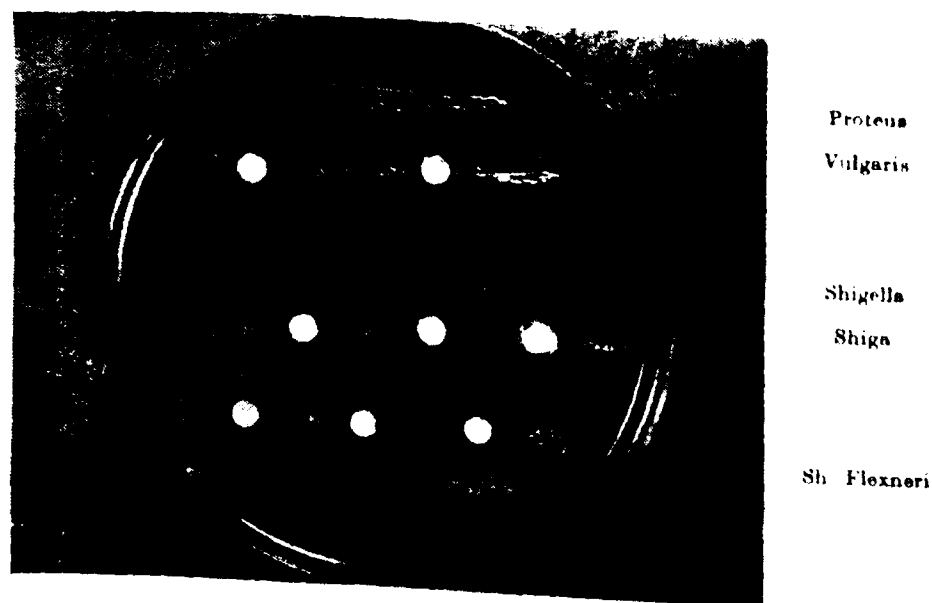


FIG. 1.

The sterile Bondi's discs are saturated in the working solution of Aureomycin and placed on the streaks at 25 mm. apart.

Various pathogenic organisms isolated are tested against Aureomycin simultaneously.

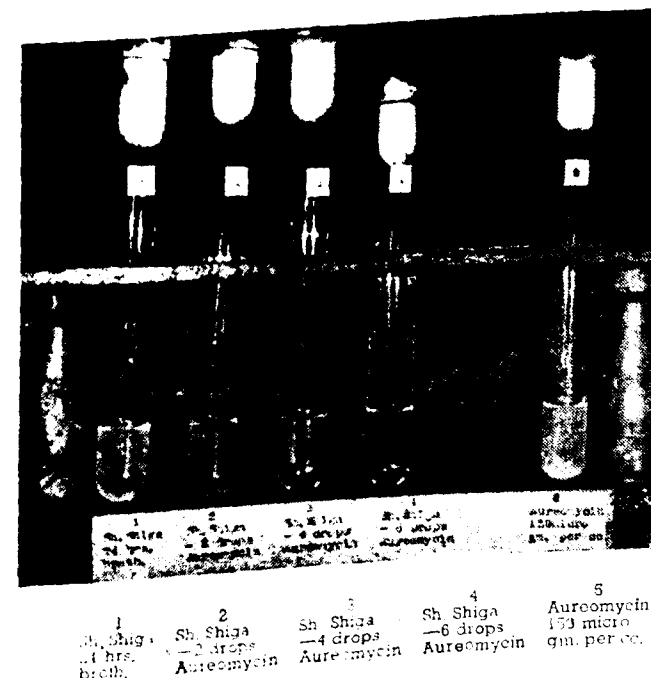
Proteus vulgaris is used as a control organism. The plates are incubated overnight and for 36 hours. Sensitivity is indicated by the inhibition of the growth around the discs. The greater the inhibition the greater the sensitivity of organisms. Figure 1 is the inoculated plate with Bondi's discs saturated with known strength of Aureomycin solution placed over the streaks. The top two streaks are of the *proteus vulgaris* which is used as a control organism. There is no halo or absence of growth around the disc, suggesting that Aureomycin has no inhibiting action on *proteus vulgaris*.

The middle two streaks are that of *Sh. Shiga* and there are clear spaces around the discs indicating the inhibition of the growth. These clear spaces are wider than the next two suggesting greater activity on *Sh. Shiga*.

The last two are that of *Sh. Flexner* showing clear spaces round the Bondi's disc but not to the same extent as shown in the central ones. This indicates that Aureomycin has inhibiting action on *Sh. Flexner* but not to the same extent as it has on *Sh. Shiga*.

Sensitivity of Aureomycin against shigella by serial dilution method:—Fig. II. This method had several initial failures as it was difficult to keep the fluid at the optimum pH.

FIG. II.



Pot. acid buffer is used with pH at 6.0.

*Stock solution:—*1500 ug per ml in 1% Pot. Acid Phosphate buffer solution of pH 3.0.

Dilute the stock solution with 9 parts of 1% Potassium Acid Phosphate buffer to give a strength of 150 ug. per ml.

4 ml. of broth is measured into each sterile test tube and to

each one drop of 24 hour broth culture of shigella organism isolated from the faeces is added.

To the 2nd, 3rd, 4th, 5th, 6th and 7th, 2, 4, 6, 8, 10, 12, and 14 drops respectively of the dilute Aureomycin solution are added and incubated for 12, 24, 48 and 96 hours and read out for the turbidity. The lowest concentration of Aureomycin in which there is no visible growth is taken.

Each test is run in triplicate.

Aureomycin inhibited the growth of *Sh. Shiga* at about 11 ug per ml. The activity of Aureomycin is tested against the three types of *Shigella* isolated from the cases treated by Aureomycin. The *Shigella Shiga* is the most sensitive among the three, being inhibited at 11 ug per ml upto 24 hours. **Sh. Sonne* is the most resistant, requiring 45 ug of Aureomycin per ml., the Flexner group standing intermediate. At 96 hours, however, the range of the inhibition is at a higher level (44 ug for *Sh. Shiga*).

Figure II demonstrates the action of Aureomycin against *Sh. Shiga* in broth cultures. No. 1 test tube is a control culture tube of *Sh. Shiga* without the antibiotic. To Nos. 2, 3, and 4, 2, 4, 6 drops

* *Sh. Shiga* is from the stock culture.

respectively of freshly prepared solution of Aureomycin containing 150 micrograms per ml are added. To each, 1 drop of 24 hours broth culture of *Sh. Shiga* is added and incubated for varying periods. No. 1 tube is uniformly turbid showing good growth of the organisms. No. 3 tube is slightly turbid suggesting slight growth and No. 4 tube which is clear suggests inhibition of growth. No. 5 and onwards are not included in the photo because there is no growth in them. The lowest concentration inhibiting the growth is in the No. 4 test tube (*i.e.*) 11 microgram per ml.

Case Reports.—**CASE I.** This was the case that was the incentive for these investigations. A male child, 1½ years old, suffering from acute bacillary dysentery, passing frank blood and mucus 30–40 times a day, was treated with Sulphaguanidine and later with Thalazole for 3 days without any effect.

The condition of the child at the time of examination was marked dehydration. The child was restless, pulse rate 140 per minute, regular but of poor volume and tension. Tongue dry and coated, axillary temperature 102·8°F. Anus red and sore. Motions contained frank blood and mucus, varying in quantity from a few drops to a drachm. Microscopic examination showed highly cellular exudate, discrete red cells. No vegetative forms of amœbæ are seen—the appearances are that of typical bacillary dysenteric stools.

The motion was sent for culture and the child was put on 50 mg. of Aureomycin every 4 hours. The bacteriological report on the motion was “*Sh. Shiga* grown from the motion.”

By the second dose of Aureomycin the character of the stool was markedly changed to faecal and no visible blood was present. By the third dose the motion appeared to be well formed with traces of mucus. Aureomycin was continued for 2 days by which time the child was completely recovered from the symptoms. The motion after the treatment was negative for *Sh. Shiga*.

Except for the slight rawness of the tongue due to Aureomycin there were no untoward effects of the drug.

CASE II.—Another child in the same family, 4 years old, had the symptoms of acute dysentery in the course of the same week. The child, besides having dysenteric symptoms, was having nausea and vomiting which increased with the administration of Thalazole. The motion was sent for culture and the child was put on Aureomycin.

At the time of examination the child's axillary temperature was 101·4°F., pulse 124 per minute. Motion was frankly blood and mucus, alkaline in reaction. Motion culture report was *Sh. Shiga* grown.

This child too showed miraculous improvement by the 2nd dose and was absolutely symptom-free by the end of the 2nd day after the commencement of Aureomycin therapy.

CASE III.—A female child, 12 months' old, passing dysenteric stools every half hour, was treated with Penicillin parenterally, and Sulphaguanidine orally, without effect. The condition of the child at the time of examination was toxic, unable to take any feeds, with axillary temperature of 103·6°F., pulse rate 160 per minute. Motion was frank blood and mucus, highly cellular on microscopic examination. Motion was sent for culture and the child was put on Aureomycin. Contents of one capsule of 250 mgm. were divided into 6 doses and each portion mixed in honey was given orally every 4 hours. Within a course of 6 hours the temperature steadily dropped and by the 4th dose the fever subsided and the motion turned faecal.

Motion culture report was *Sh. Flexner* grown and negative at the end of treatment.

CASE IV.—A child, 4 years old, having dysentery for 6 days passing 15–20 motions per day with tenesmus, was treated alternatively with Sulphaguanidine and Thalazole without effect.

At the time of examination the child was showing signs of dehydration and the temperature was 99·8°F. and tongue was coated. Microscopic examination of the stools showed rich cellular exudate and no vegetative forms of *endamoeba histolytica*. Motion was sent for bacteriological investigation and the child was put on Aureomycin in doses of 50 mgm. orally. The child showed marked improvement by the 4th dose and was symptom-free by 48 hours. *Sh. Flexner* was grown from the stools in this case.

COMMENTS AND CONCLUSIONS.—It is indeed surprising why so very few papers have been published regarding its action against *Shigella* group of organisms.

While using Aureomycin in the treatment of various infections we have observed a change in the gross character of the stools and microscopically an alteration in the faecal bacteria. In addition, Aureomycin has both local and systemic action. *Shigella* infection is purely a local infection, the organisms growing and multiplying in the mucous membrane. Since it is possible to produce high concentration of the drug locally by oral administration the organisms can be dealt with, rapidly and effectively.

There are only two papers which have favourably reported.

Collins and Paine report prompt bacteriological and clinical response in two cases of *Shigella* dysentery in 4 years' old children.

Brainerd and his co-workers report also favourable response to Aureomycin in cases of bacillary dysentery. The paper on the action of Aureomycin on *Shigella* organisms by Alexander *et al* is inconclusive.

The wide antibacterial spectrum of Aureomycin and the alteration in the intestinal flora in cases receiving Aureomycin orally,

should have prompted exploration of the possible activity against *Shigella*.

The four cases which are herein reported, and which were resistant to Sulpha drugs, responded promptly and effectively to Aureomycin. The dysenteric bacilli isolated from these cases were tested for sensitivity against Aureomycin by Bondi's disc method and by serial dilution method. The laboratory reports prove that the growth of shigella is inhibited in varying strengths ranging from 11 ug to 44 ug per ml depending upon the organism tested, confirming the clinical improvements. Although more cases have to be tried and tested it must be said with justification that when the Sulphanilamides are ineffective, Aureomycin is the drug of choice and is an effective remedy against bacillary dysenteries.

Summary.—1. The literature on Aureomycin is reviewed.

2. Chemistry, pharmacology and bacteriological investigations are described.

3. Laboratory investigations of the action of Aureomycin against a variety of shigella organisms *in vitro* are described in detail.

4. Case reports of four dysentery cases treated and cured by Aureomycin are recorded.

5. The utility of Aureomycin as the most effective and specific antibiotic against dysentery bacilli, especially when the Sulpha drugs fail, has been stressed.

Acknowledgement.—I am indebted to Prof. N. G. Pandalai, M.D., D.T.M., F.B.C.P., Professor of Bacteriology and Principal, Anihra Medical College, Visakhapatnam for his valuable advice and guidance. My thanks are due to my colleagues of the Bacteriology Department for their help and to the Photo-Artist for the photography. I am thankful to Messrs. Lederle Laboratories, Bombay Branch, for their supply of Aureomycin to conduct these experiments.

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PENICILLIN THERAPY IN ACUTE NEPHRITIS*

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WE aim at two things for the successful treatment of a disease—first, to give relief to the patient and, second, to get rid of the etiological agent which is responsible for creating the mischief—the pathological changes in the body which subsequently have given rise to the train of symptoms and signs. The first is always the primary concern of the patient who wants relief of his troubles; he worries the least for the diagnosis of his disease and so the physician has to do all that he can to achieve this end; the second is mainly the concern of the doctor, as it is necessary for the rational treatment to attack the offending factor and so correct the defect and also prevent further mischief occurring. This is the most important part of the treatment because if the offending factor is allowed to remain and flourish, however the patient may have a feeling of temporary relief, the latent infection may smoulder again and throw the patient to the bed once more and may even in due course cost his life.

The eradication and control of the etiological agent should, therefore, be a doctor's primary concern and this applies much more to acute nephritis than to any other condition. For this reason one has to eradicate the causal factor which is usually the streptococcus hæmolyticus. We know that streptococcus does not attack the kidney directly—no streptococcus has been isolated from the urine or from the kidney in this disease. The infection is far off from the damaged organ—a distant focus of infection—either in the throat or an ulcer on any part of the body; a focus which has started the pathological changes in the kidney and is, therefore, extrarenal. The kidney suffers in an indirect manner—probably by way of an allergic response to this far off infective focus.

The onset of symptoms is always preceded by an infection of the throat, ulceration etc., and consequently the infection has to be eradicated to save the kidney from damage and if it has suffered already then to prevent further damage and avert the fatal issue. Further, the repetition of assaults should not be allowed to occur, otherwise the organ may suffer at each fresh infection and a chronic stage be reached. With the institution of a satisfactory treatment there is no doubt that the thrown-out-of-gear glomerular tufts will undergo repair and their functions will be restored.

Till a few years back no drug was found to be specific for the streptococcus hæmolyticus. The treatment, therefore, naturally had to be aimed at giving rest to the diseased kidney and to treat the symptoms as they arose. The patient was put to bed, was kept warm to prevent him from exposure to chills, solid food was

withheld, only glucose and fruit juices were given and fluids limited. All these measures aimed at giving rest to the diseased organ and take away as much load as possible from this diseased kidney—only giving some nourishment consistent with the basic needs of the individual.

With the advent of the antibiotics—the Sulpha group of drugs—a ray of hope appeared that this disease may be satisfactorily treated. The Sulphonamides act as a specific on streptococcus hæmolyticus but this cannot be considered a safe drug in acute nephritis as this may cause crystalluria and hæmaturia. It is said that Sulphanilamide does not cause crystalluria or hæmaturia and it is considered a safe therapeutic agent in renal conditions on account of low toxicity³ but the results were not encouraging in the treatment of acute nephritis.

Penicillin therapy^{2,3} may be considered a much more safe drug; in fact, it may be considered to be a drug of choice for this condition. It has been used with astonishing success in 7 cases reported below.

Method of administration.—The drug was injected intramuscularly in smaller doses as it was thought that on account of the oliguria the drug would not be excreted quickly and an adequate concentration may be maintained in the circulation. When plain Penicillin was used—20,000 units to 25,000 units were given four hourly. In some cases Duracillin (aqueous) was used for convenience to the patients as they could not have four hourly injections for want of facilities. In these cases 200,000 units were given morning and evening.

The patients appeared to react very well.

- (1) First the temperature declined within 48 to 72 hours, after the drug was started and the heaviness in the head disappeared.
- (2) Then the urinary output increased and œdema began to diminish.
- (3) After this the blood pressure declined and became normal in about 8 days.
- (4) Later the amount of albumin in the urine became less.
- (5) Lastly the size of the heart returned to normal and the soft systolic murmur disappeared.
- (6) The course of the disease was shortened by 15 to 25 days and the convalescence was rapid.
- (7) Penicillin was given from 10–18 days with an average of 13 days.

These different aspects in the improvement have been diagrammatically represented in accompanying figure (*Fig. 1, vide page 802*).

* Specially contributed to THE ANTHROPOLOGIST.

168/94 mm. and blood urea 52.6 mgm.%. She was given Penicillin 25,000 units 4 hourly. On the 3rd day she was better, the temperature and cough subsided, urine increased in amount and became clearer and lost its reddish colour after 6 days, oedema lessened and disappeared in 16 days. The blood pressure came down to normal after 12 days of Penicillin therapy. The blood chemistry was normal after four weeks and Van Slykes urea clearance test was normal at this time.

CASE IV.—A child, aged 3½ years, suffered from bronchopneumonia and sore throat. Eleven days after the onset of his illness his parents noticed that he was getting high coloured scanty urine. Oedema gradually appeared, first on the face, then on the feet, and the abdomen became gradually distended. When the patient was seen 20 days after the onset of the illness, he was severely oedematous. He had a temperature of 99°F. to 100.5°F, anæmic, lungs were congested, urine was loaded with albumin and microscopic examination revealed presence of red blood cells and hyaline casts. The child was restless. Penicillin was started 20,000 units 4 hourly and an Alkaline Diuretic mixture was given. Five days after Penicillin had been started, the child showed signs of improvement; he was less restless, started taking interest in his surroundings. Another five days after the increase in urinary output was noticed and oedema showed signs of diminution. After these ten days, the 4 hourly Penicillin injections were substituted by Duracillin 200,000 units morning and evening as the child cried severely at the sight of the needle and the parents objected to 4 hourly injections. Duracillin was continued for 4 days. By that time i.e., 14 days after the Penicillin therapy had been started, the patient was considerably better—oedema had markedly lessened, and albumin diminished in urine. When the patient was again seen after 15 days i.e., after 29 days of starting Penicillin therapy, there was practically no oedema and urine showed only a trace of albumin.

CASE V.—A child, aged 6½ years had suffered from fever, running of the nose, and bronchopneumonia for 8 days. He got better and was rather well for 8 days, then he again got an attack of cold when the parents noticed scanty and smoky urine. Next morning they noticed puffiness under the eyes. Gradually the oedema increased over the face and it also appeared over the feet and legs. When the child was first seen 15 days after the second attack of fever, he was very restless, coughing, throat was congested and signs of bronchopneumonia were detected. Penicillin 20,000 units was given every 4 hours for 5 days and Duracillin 200,000 units was given morning and evening for 8 days. The patient's general condition improved after a fortnight and when he was again seen after 10 days he was in a very good condition. The oedema had practically disappeared though the urine still contained a fair amount of albumin. As he was coughing a little and the throat

was somewhat congested a further course of Duracillin 200,000 units morning and evening was given for six days. When the patient was seen 12 days after, all the oedema had disappeared and he looked like a normal child, but urine still contained a trace of albumin.

CASE VI.—A male patient, aged about 20 years, suffered from sore throat, fever 103°F to 104°F. He was treated by his doctor with Sulphonamides and ordinary fever mixture. The patient was cured after about ten days, but got high fever with rigor again. The doctor thinking that it was a malarial fever attack prescribed a course of Quinine. The fever subsided only a little and the patient showed signs of acute nephritis—high coloured scanty urine, puffiness of the face, slight anæmia. He was treated for this condition but to no relief. I happened to see the case about six weeks after the onset of symptoms. Penicillin was advised—Duracillin 400,000 units morning and evening for six days. No signs of improvement were noticed. Penicillin (plain) 50,000 units I. M. was then advised every 4 hours. The urine output increased after 6 days and oedema showed signs of declining. The Penicillin therapy was continued—30,000 units four hourly—for 4 days. The improvement continued and 3 weeks later he had no oedema, the urinary output was practically normal and albumin was present in traces only.

CASE VII.—A child, aged 5 years, was admitted in the S. N. Hospital on 6-10-'50 with (1) massive oedema all over the body of about 2 months' duration, developing four days after an attack of sore throat and mumps; and (2) oliguria for two months. On clinical examination the child was found to be oedematous, anæmic, had pyrexia, both the lungs were congested more so over the bases, cystolic murmur was heard in the mitral and pulmonary areas. On 7-10-'50 the blood examination showed leucocytosis. Total W.B.C. 14,500 per cmm. Polys 82%, Lymphocytes 14%, Eosinophils 4%, R.B.C. count 2,350,000 per cmm. Hb. 7.5 gms. per 100 cc. Urine was small in quantity, reaction acid, albumin present. Urine was examined on 17-10-'50, R.B.C. and no casts were found. Blood chemistry—Blood urea 42.5 mgms%, N.P.N. 38.2 mgm. %. Blood proteins 3.7 gms.%, Blood cholesterol 400 mgs.%, Serum Calcium 5.7 mgm.%. Treatment which he was given in the beginning consisted of a diuretic mixture and Penicillin 33,000 units 4 hourly I.M. and a salt free diet. After two days the patient's temperature subsided. The Penicillin was discontinued. Only 2 days after the father said that his doctor had told him that the child was sensitive to Penicillin and he did not agree for the injections. The patient's condition did not show any sign of improvement. Funduscopy when done at this time showed no abnormality.

On 18-10-'50 when the condition was not found to be improving, in addition to the usual treatment 25,000 units Penicillin was started 4 hourly.

On 20-10-'50 condition improved. Oedema was very much less, urinary output increased. Albumin was still present in the urine.

Penicillin was given for 3 days and then stopped. On 23-10-'50 condition again flared up. Lungs were congested, oedema was marked and urinary output decreased to 3 oz. only in 24 hours.

On 31-10-'50 the patient had an attack of cold and the condition again got worse, urinary output lessened to 3 oz. daily. On 1-11-'50, and he had to be given Coramine injections and also by mouth. No improvement in the patient's condition was noticed and the Penicillin was continued upto 8-11-'50 when it had to be discontinued for lack of supply. The condition gradually went on deteriorating and on 12-11-'50 Penicillin was again started.

On 13-11-'50 condition was improved, urinary output was 16 oz. and oedema markedly decreased. Penicillin was continued till 20-11-'50, the condition of the child remained quite satisfactory onwards. There was no oedema. He looked like a normal child for his age. Albumin lessened in the urine.

Blood examination done on 11-12-'50 showed W.B.C. count to be 16,300 per c.m.m. Polymorphs 48%, Lymphocytes 44%, Large monocytes 1%, Eosinophils 7%. Total R.B.C. 3,700,000 per c.m.m. Hb. 9.5 gms. per 100 c.c. Screening of the heart was normal on 12-12-'50. Blood urea (on 13-12-'50) was 23.8 mgm%. Urea clearance 39.25% of the average normal.

I am thankful to Dr. H. N. Bhatt, M.B., F.R.C.S., D.M.R.E. (London), Superintendent, S. N. Hospital, for allowing me to publish the case No. 7.

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What Can Happen When Diabetics Marry?

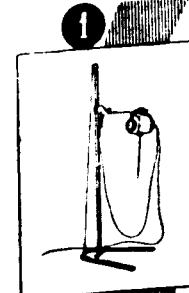
Lincoln reports an interesting case of a family in which the father died of diabetes mellitus at the age of 55. The mother, who died at 73 years of age, was a diabetic during the last 10 years of her life and during those years was obliged to take insulin thrice a day. She died in coma several days after discontinuing insulin therapy. There were nine children in the family and two of these died of diabetes in childhood. The remaining seven are all obese and in all except one who though ill refused medical aid for religious reasons, diabetes and in abnormal sugar tolerance have been demonstrated.—(*North West Med.*, 49, 466, 1950).

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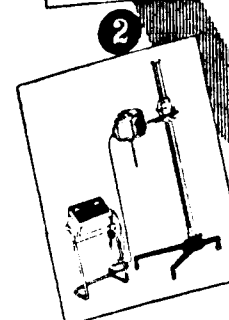
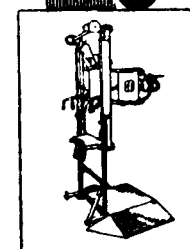
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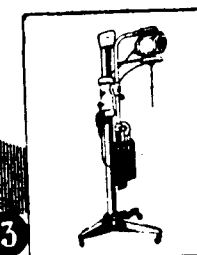


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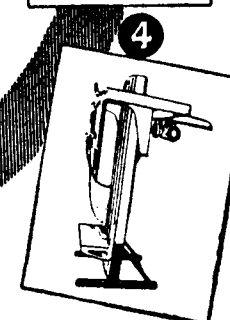
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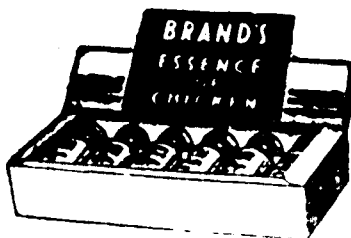


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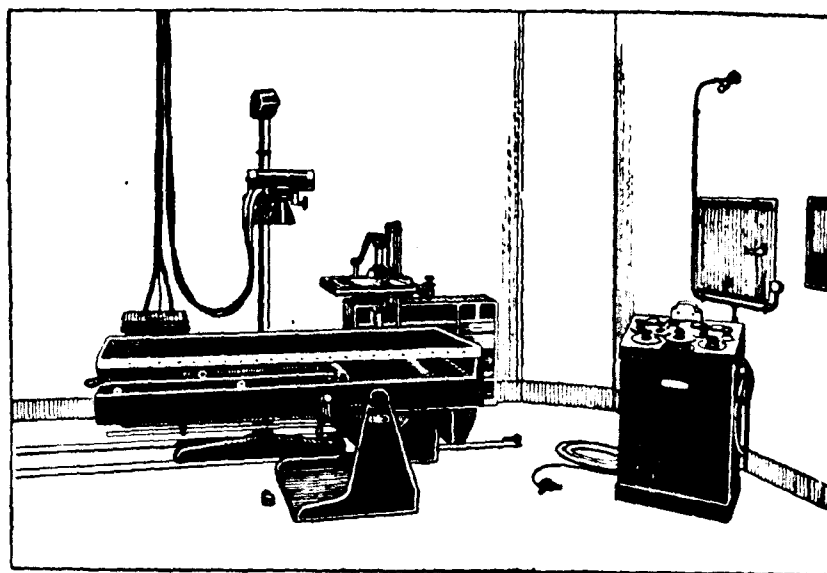
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"SPA-TREATMENT"*

A Plea for Its Study and Development in India

PART I.

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THE sense of well-being and health associated with certain places is popularly held to be due to the quality of the drinking water available in that area. Thus certain places are recommended to us on the ground that the water there is 'very healthy.' Our vague impressions are ascribed to the 'bilious' or 'constipating' nature of the water. Apart from this, certain natural waters are believed to possess miraculous powers of curing the most intractable diseases.

It is true that most of these beliefs are founded on mere faith. But we have to admit that few systematic attempts have been made to sift the grain of truth from the chaff of blind faith. Now and again, we hear of a water which is claimed to have been found useful in certain diseases. People flock to the place and carry the water for the use of sick relatives. At best, the matter receives a short-lived publicity in the newspapers and then we hear no more about it. The very enthusiasm brings the spring a bad name because of the indiscriminate application of the remedy to all conditions.

On the other hand, in the West, the claims are promptly investigated and the springs are developed into suitable centres of treatment to which tired and run-down people can resort to enjoy a pleasant break in their usual routine and return to their old life with a vigour of mind and body which does credit to the 'Spa-treatment'. Modern Spa-treatment is manysided. Not only do the patients drink the water and bathe in it but they can also have treatments such as diathermy as well as irradiation therapy with infra-red, ultra-violet and X-rays. A section of 'mechanotherapy' provides facilities for the patients to take exercises (ranging from the most passive ones) graduated by specialists according to their state of health. The 'spas' at Vichy have facilities for swimming, games such as Tennis and Golf, and open air sports and physical exercises. The children are not forgotten. They have a special garden and gymnasium for themselves.

Spa-treatment has been found to be of value in skin diseases, intestinal inertia, various forms of dyspepsia and hepatic disorders, arthritis, rheumatism, gout, obesity, diabetes combined with dyspepsia, and lithaemia, cardiovascular diseases not involving structural changes (e.g., functional debility of heart muscle, simple tachycardia, blood pressure due to functional spasm of the heart

* Specially contributed to THE ANTISEPTIC.

muscle but not that due to arteriosclerosis), anæmia, debility neurasthenia and some types of paralysis. It is claimed that unlike the usual symptomatic treatment, Spa-treatment rectifies the underlying conditions such as 'deficient functioning of the internal secretory glands, an unbalanced condition of the vegetative nervous system, digestive, gastric, intestinal or hepatic troubles' and is hence 'positively indicated in all cases of headache'.³

EXTERNAL TREATMENT.—One of the main objects of Spa treatment is to stimulate physiological activity by external treatment as in baths as well as by internal administration of the waters. The baths are of many types. In the *immersion bath*, the patient reclines, sits, stands or moves about in a deep pool of water which may be at 'thermal' (98–104°F.) or sub-thermal (90–98°F.) temperatures. Under-water massage and local douches may supplement the bath-treatment. Massages may be given under the continuous affusion of warm water. Air may be forced into the baths under the surface of the water to produce additional stimulation of the skin. The water may be violently agitated by turbines as in the 'Whirlpool bath' prescribed to treat stiff joints. Ingredients such as Sulphur, brine or peat may be added to the bath water. Different parts of the body may receive special attention as (for example) in the foot baths and hip baths. Local packs—usually of mud, Fuller's earth, or peat—are also a common adjunct of bath treatment. Lavages may be given for parts of the body such as the throat or stomach. In the *vapour bath* (Berthelot's bath) the patient sits with his neck and head protruding out of a cabinet which is filled with moist vapour at 108–112°F. for 15 minutes or longer. As the patient comes out of this chamber, he walks through a series of rain douches gradually cooling down to 85°F. Hot packs (e.g. swathing with hot towels) follow and prolong the action of bath treatment in producing profuse sweating.

Immersion baths at temperature slightly higher than that of the body cause a rise of body temperature which may persist for some hours after leaving the bath. This increases the intake of oxygen and elimination of carbon dioxide and also considerably increases the elimination of sweat and urine. The elimination of sweat may be further increased by packing the patient in hot towels. Liver packs are claimed to produce local hyperæmia, oxidise the fat with which the liver is infiltrated and restore the liver to normal activity. Vapour baths are useful in cases of obesity as they increase the oxidation of carbohydrates (by increasing the intake of oxygen) and help the absorption of fat deposited in the subcutaneous tissues.

The effects of bath treatment on the general circulation are exerted through the effects on peripheral circulation. In deep baths, the weight of water compresses the superficial veins and capillaries and promotes the return of venous blood. Hot baths

cause dilatation of the capillaries and thus a marked increase in the volume of the cutaneous blood flow. Massages aid these effects by materially assisting the passage of blood through the vessels of the subcutaneous tissue and superficial muscles. It is found that the blood pressure is largely influenced by the temperature of the bath so that, by proper adjustment, it is possible to modify the load against which the heart works and thus obtain relief of symptoms of cardiac strain and breathlessness. Baths in effervescent waters act as mild irritants to the skin, cause relaxation of the cutaneous vessels and a slowing of the heart-beat. The improvement in circulation effected by bath treatment helps in the elimination of toxins. It is also found that bath treatment improves the hæmoglobin content of the blood.

Baths subject the skin to a variety of stimuli which can affect the nerve centres. Thus the alteration of hot and cold baths (as in the "jet-douche" treatment) can re-educate the heat regulating centres to respond readily to differences of temperature and thus increase the resistance to disease especially in the case of persons who are easily susceptible to cold. The use of a tepid bath (93°F.) protects the body from sensory stimuli and acts as a sedative in cases of mania, delirium and mental excitement. The relief of insomnia by hot baths is well known. Pain is relieved by hot baths or hot packs which cause dilatation of the capillaries and relieves the pressure due to congestion of the engorged blood vessels. The sense of touch may be stimulated by mechanically stirring the water as in the whirlpool bath or by liberation of compressed air into the bath. Under the sedative influence of a warm bath, the rigidity of the limbs in conditions such as plastic paraplegia is gradually overcome so that at first passive movements and later active movements become possible. The immersion of the limb in water makes movements easier.

It is sometimes held that the beneficial effects exerted by the various baths are entirely due to the physical stimuli due to the increased temperature or massage. While it is true that physical stimuli do play a large or even major part, it would appear that the chemical composition of the bath water cannot be dismissed as a matter of no consequence. Even assuming that the beneficial effect of baths is mainly due to the physical stimuli, we have to admit that the chemical composition of a water may modify the nature of the stimuli. Thus stronger salt waters are preferred in baths to treat cases of arthritis, probably because the higher density of brine minimises the effort required to enable movements of the limbs.⁴ It has been reported that beneficial results were obtained in cases of venous thrombosis and varicose veins by treatment in a warm bath of water containing sodium carbonate and alum but that no such results were obtained when plain water was used.⁵ Apart from this it is known that specific ions can penetrate the

unbroken skin when bath treatment is being given. For example, taking a bath in a mineral water was found to increase the content of iodine in blood by 11·7% whereas applications of mud packs raised it still higher.⁶ During a 12 minute immersion in a thermal bath containing carbondioxide and radioactive gases, significant quantities of both were absorbed through the skin.⁷

Ingestion of mineral waters has been found to be of particular benefit in cases of metabolic disorders. The waters of Bath and Cheltenham are beneficial in cases of chronic constipation, colitis and hæmorrhoids. People suffering from dyspepsia of various types (such as that due to loss of tone of muscles or secondary dyspepsia due to liver, endocrine or diathetic troubles) and from irritant conditions of the gastro-intestinal tract show a marked beneficial effect. 'Amongst the chronic diseases regarded by medical tradition as suitable for hydromineral treatment biliary lithæmia stands in the front rank.'³ The blood cholesterol and bilirubin come down and the urine is rendered free of bile salts and pigments. Mineral waters are also helpful in cases of congestion of the liver whether due to gross overeating or associated with various fevers such as malaria, influenza or with conditions like gout, obesity or diabetes.³ Certain mineral waters increase the secretion of bile and improve its character. The usefulness of mineral waters in cases of gout, rheumatism and arthritis is well established. Chalybeate waters are useful in cases of debility and anæmia. Some mineral waters are of value in certain functional and degenerative conditions of the heart as they are able to increase the systolic contraction and cardiac output. Vichy treatment was found to have brought down the blood sugar from 2·09 to 1·38%, the blood cholesterol from 2·25 to 2·03% and rendered the urine free from sugar in cases of fatty diabetes, diabetes, combined with dyspepsia, lithæmia and gout. The administration of a Roumanian mineral water was found to have brought down the blood sugar and urinary sugar 'in 50 diabetic patients'⁸.

The general effects of the ingestion of mineral waters is an improved elimination of waste materials through the renal and gastro-intestinal tracts as well as a stimulation of the digestive secretions.

The types of waters which are not very rich in salts ("indifferent waters") and do not contain a preponderance of any particular salt probably owe their beneficial effects mainly to a flushing action on the gastric tract. Waters containing moderate amounts of sulphates and alkalies (*e.g.*, Cheltenham waters) have a mild laxative action and prove of value in chronic constipation. Waters much richer in salts—the stronger waters—are of use in cases like blood pressure and dropsy since their administration cause the passage of water from blood to the intestines.

Increased elimination of waste material is brought about not only by inducing diuresis and laxative action but also by actually

increasing the proportion of waste material in the excreta. Thus the increased elimination of uric acid through the urine is well known. "Strong Sulphur waters" increase the elimination of solids through the kidneys and sweat glands and also increases the excretion of total nitrogen, creatinine, uric acid and urea.

Alkaline waters dissolve out the mucous and also have a sedative action so that they are of value in irritable conditions of the gastro-intestinal and urinary tracts and in conditions of fasting and acidosis. (During one of his fasts, Mahatmaji was prescribed an alkaline mineral water from Vichy).

Effervescent waters exert a tonic action on the flabby stomach. Sulphur waters increase the tone of the intestines and of the pyloric and ileo-colic sphincters. The gastric secretions and the flow of bile is also increased.

Chalybeate waters (i.e., waters containing ferrous iron and sometimes small quantities of arsenic) have been found to be useful in cases of debility and anæmia.

Unfortunately, there appears to be a prejudice against the Spa-treatment. It is felt in some quarters that the beneficial results—if any—are due to the change of surroundings and auto-suggestion. While these factors are admittedly powerful contributory causes in any method of therapy, it appears to be too sweeping to say that the mineral waters are not of any value at all.

Much of the disrepute that attaches to Spa-treatment is due to its being looked upon as a sort of panacea without attempting to realise its limitations and use it with discrimination for cases where it is particularly suited. Thus it would be useless to prescribe bath treatment in cases of permanent structural changes in the valves of the heart but a case of functional debility of the heart muscle would be expected to improve. Similarly, bath treatment is useful in cases of obesity since it increases the rate of oxidation of carbohydrates, stimulates the cutaneous and subcutaneous blood vessels and thus helps in the absorption of subcutaneous deposits of fat. But when endocrine balance is also a contributing cause for the obesity, mere reliance on bath treatment only results in a bad name for this method of therapy.

Probably another reason for the feeling that the beneficial effects of mineral waters are mythical is that the results of chemical examination do not always support the claims made for therapeutic effects. It is true that the pharmacological action exerted by the mineral waters are often far in excess of what could be attributed to its content of salts. It is also true that solutions compounded so as to approximate to the chemical composition of a mineral water do not always have the same beneficial effect. These observations should, rather, make us consider whether the routine chemical examination is a sufficiently accurate yardstick to measure the

therapeutic effect of a mineral water rather than refuse to believe the experience of people who have benefited by the use of these waters

Various suggestions have been made to explain the inadequacy of ordinary chemical analysis to assess the therapeutic activity of a mineral water. The usual analytical methods give at best an idea of the ions constituting the major saline ingredients and we have to guess how these ions are combined. From this data, we attempt to deduce the specific actions that may be exerted if each of them was present in a pure solution at that concentration. It is quite conceivable that these ions may have a reciprocally modifying influence so that the action exerted by a particular combination of ions may not be the same than that exerted by any one of them considered separately. Ringer's classic experiments are a case in point. When an isotonic solution of Sodium Chloride was used for transfusion, the isolated heart stopped beating after some time. It was necessary to add small amounts of Calcium salts to give a tonic effect. Even if this was not sufficient, it was found necessary to add small amounts of Potassium salts to counteract the effect of Calcium salts and make the heart beat for a longer time. This illustrates that isotonicity is not the whole story. The experience of workers in plant nutrition also shows that ion can have a mutually antagonistic action and that it is not permissible to look upon the effect of a soil solution as the sum-total of the accepted effects of individual ions.

In routine chemical examination, it is not usual to look for substances which may be present in traces. It is being realised that these 'trace elements' may play a greater part than the grosser constituents with which we are more familiar.⁷ Another point to be borne in mind is that some elements may prove beneficial when present in extremely low concentrations but harmful when present at higher concentrations. A case in point is afforded by fluorine.

Chemical examination does not give much information about the form in which particular constituent is present. It is conceivable that the same substance may be present in a more reactive form under certain conditions.

There is some evidence that mineral waters exert beneficial effects by their action on the enzyme systems in the body. Rabbits and Guinea-pigs fed on a Carlsbad mineral water showed a 50% increase in liver glycogen and a 30% activation of liver amylase¹⁰. Amylase prepared from a Yugoslavian mineral water split off 4 to 25% more maltose than that prepared with distilled water¹¹. Many mineral waters catalyse the decomposition of hydrogen peroxide—an action which cannot be entirely explained on the basis of its content of manganese. Woodmansey suggests that this ability to decompose hydrogen peroxide is valuable in the promotion of protein metabolism by the mineral water⁹. Sulphur waters depress the movements of the cilia in the intestine of the frog¹². Continuous administration

of the water from a hot spring in Carlsbad to rabbits increased the activity of the detoxicating mechanism to such an extent that fatal doses of Sparteine Sulphate proved innocuous¹³.

A routine chemical examination can give us an idea of the major saline constituents and indicate the effects that these may be expected to exert. Such an examination is also valuable in comparing our mineral waters with those foreign ones whose therapeutic reputation is established. But as the subject is so little developed, we cannot hope to completely explain the observed therapeutic effects of a mineral water on the basis of the routine chemical tests. We are therefore not justified in refusing to believe in the reputation of a healing water because chemical analyses does not reveal such properties. It appears undeniable that mineral springs do exert specific effects on the human system and that—when used with discrimination—they can exert a beneficial action in a number of cases.

Our country abounds in springs many of which enjoy a century old reputation for healing various diseases. Many of these waters have been shown to be similar in composition to the waters of some of the established 'Spas' in the West¹⁴. Some of them are situated within easy reach of towns and offer scope for development. As was pointed out by the Indian Medical Association¹⁵ as early as 1932, it appears very necessary to investigate their therapeutic reputations and develop at least a few of them into modern centres of 'Spa-treatment'.

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Bronchial Asthma in Infant Due to Allergy to Tobacco Smoke

A case of asthma and rhinitis in an one year old child with a strong family and personal history of allergy, is reported by Rosen and Levy of Newark, New Jersey. Passive transfer tests revealed positive reactions to tobacco and other antigens. Cessation of smoking by the mother resulted in complete relief of the child's symptoms during an observation period of nearly 2 years.—(Case Report, J. A. M. A., 21-12-1950, p. 620).

EFFECTS OF REGRESSION AND PROGRESSION OF EVOLUTION ON CERTAIN HUMAN STRUCTURES

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OCCASIONALLY certain structures are met with during dissection of human body, that are not its normal entity. On further study, some of these structures are found to be new appearances without its homologue occurring in the lower animals, while the others have their homologue in the lower animals. The former represent progression of evolution. The latter structures represent regression in evolution due to missing of the final step of conversion into the present normal.

As an example of progressive evolutionary change we have encountered—

Accessory Extensor Carpi Radialis.—This muscle was taking origin from the lateral supracondylar ridge of the humerus in common with the extensor carpi radialis longus with which its fleshy fibres were fused (Fig. 1). About $3\frac{1}{2}$ inches below the elbow, it separated out as a fleshy belly about $\frac{3}{4}$ inch wide and it became tendinous 5 inches below the elbow.

Running downwards and slightly forwards across the lateral border of the forearm, it crossed superficially on its way the extensor carpi radialis longus, abductor pollicis longus and insertion of the

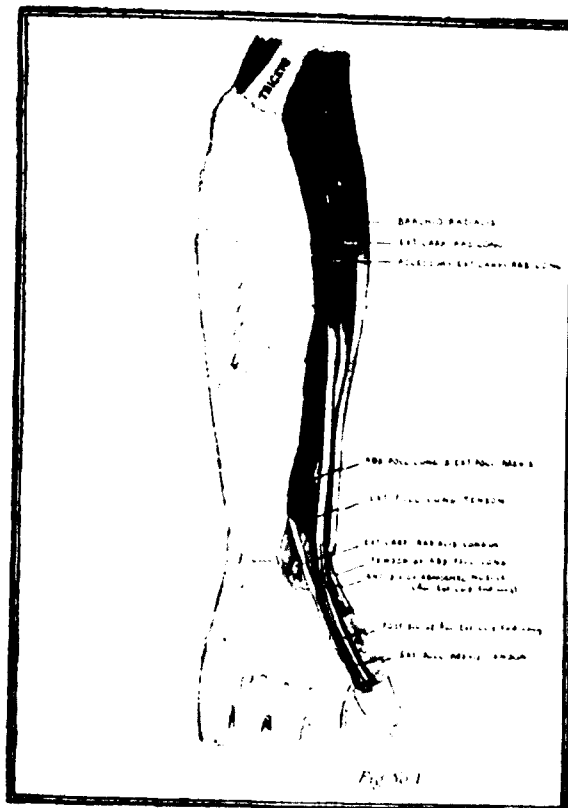


Diagram showing Accessory ext. carp. rad. long.

* Specially contributed to THE ANTISEPTIC.

brachioradialis. About 2 inches above the wrist, it divides into two parts which accompanied each other till the lower end of the radius and then separated to get inserted as follows:—

The posterior of the two parts proceeded downwards along the lateral side of the tendon of extensor pollicis brevis and after giving a slip to be inserted into the trapezium, got inserted into the dorsum of base of the proximal phalanx of the thumb, lateral to the insertion of the extensor pollicis brevis. The anterior part got fused with the tendon of the abductor pollicis longus.

Nerve of supply was the same as that of extensor carpi radialis longus.

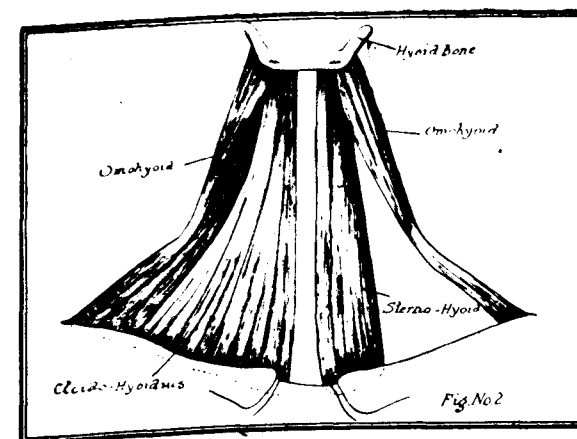
Muscle with the corresponding attachment is not met with in the lower animals, and its presence in certain individuals is indicative of further specialization and is an attempt to supplement the muscles moving the thumb. In all probability during the course of time, this muscle will be one of the normal human muscles.

Examples of regressive changes we have met with:—

1. *Cleidohyoideus*.—The origin of this muscle was an extension laterally of the normal origin of the sternohyoid on the posterior surface of the clavicle to become continuous with the inferior belly of the omohyoid which, in this case, was also taking origin from the back of the clavicle and not from the scapula (Fig. 2). The insertion

of this continuous sheet corresponded to the normal mode of attachment of the sternohyoid and the superior belly of the omohyoid to the hyoid bone. The muscle was supplied by Ansa Hypoglossi.

This muscle represents the cleidohyoideus of lower animals, the central part of which becomes fibrous in the



human being, to leave the edges muscular that are named sternohyoid and the inferior belly of omohyoid.

2. *Nerve to the Pectoralis Major*.—Normally the pectoralis major is supplied by lateral and medial pectoral nerves from the lateral and medial cords of the brachial plexus respectively. But in this case the lateral pectoral nerve, as such, was absent and was replaced by a nerve arising from the upper trunk of the brachial

plexus (Fig. 3). This nerve was passing laterally and downwards under cover of the inferior belly of the omohyoid muscle, suprascapular vein and the subclavius muscle. Then it passed superficial to the subclavian vein and after giving a few fine branches to the pectoralis minor, it pierced the clavipectoral fascia and ended in the pectoralis major.

While passing deep to the subclavius muscle it supplied this muscle and sent a twig of communication to the phrenic nerve.

The normal nerve to the subclavius and the lateral pectoral nerve were absent. The medial pectoral nerve was normal. There

was no communication between the medial pectoral nerve and this nerve. Probably that loop of communication has been replaced by the branches given directly to the pectoralis minor muscle by this nerve.

The distribution of this nerve corresponds to the distribution of the lateral part of pectoral sling, that is present in certain lower animals, such as *Semnopithecus entellus* (Ayer).

3. *Flexor Digitorum Brevis*:—This muscle (in a right foot) showed division only into three tendons going to the second, third and the fourth toes (feature which is not very unusual) (Fig. 4, vide page 817). On reflecting this muscle, it was found that two bipinnate fleshy slips were arising from the tendon of the flexor digitorum longus. This tendon issuing from the upper and outer belly which was larger of the two ($1\frac{1}{2}'' \times \frac{1}{2}''$), was going to the fifth toe and was inserted in the same way as the other superficial flexor tendons. A small tendon which issued from the lower and inner belly ($\frac{1}{2}'' \times \frac{1}{4}''$) was supplementing the superficial flexor tendon of the fourth toe.



Fig. No. 3

Top: Trapezius. Right: Deltoid. Left: Suprascap. N. Omohyoid. Centre: Lat. cord. Post cord. Med. cord. Subscapular N. Right: N. To. Latissimus Dorsi Subscapular N.

Middle left: Clavicle. Subclavius. Sup. Thoracic A. N. of Bell. Abnormal nerve. Centre: Pectoralis Minor. Subscapularis. Right: Teres Major.

Lower left: Pectoralis Major. Centre: N. of Bell. Right: Latissimus Dorsi.

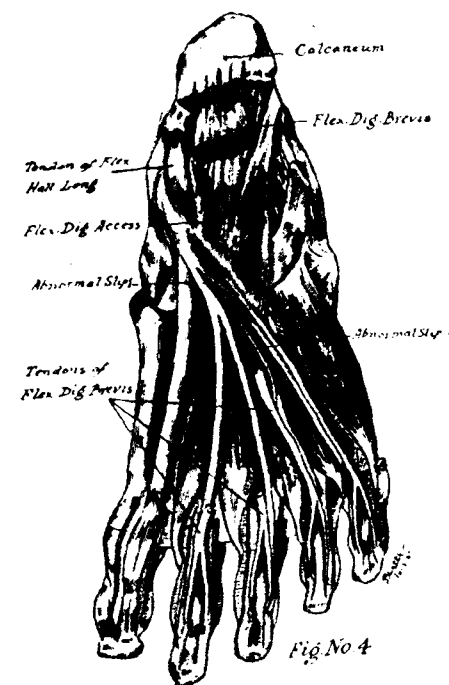


Fig. No. 4

On going through the literature we find that these slips correspond to the deep part of the flexor digitorum brevis which is a normal muscle found in *Simidæ*. These slips were supplied by branches from the medial plantar nerve.

Summary.—1. Accessory extensor carpi radialis has been reported as an example of progression of evolution.

2. Cleidohyoideus, abnormal nerve to pectoralis major and deep head of flexor digitorum brevis, are examples of regression in evolution.

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Blood Findings in Men on a Vegetarian Diet low in Animal Protein

Dr. Mirone working in the nutrition laboratories of the University of Athens, selected 11 men who for 12 to 47 years had never consumed meat, poultry, or fish. Their usual daily animal protein intake was supplied by 3.8 pint of skimmed milk containing about 6 grammes of protein. Extra animal protein was consumed occasionally in the form of more skimmed milk, cheese, butter and egg bringing the total on 57 days of the year to 50 grammes and on 28 days to 53 grammes per day. Haematological and chemical studies on venous blood gave results which were within the normal range for healthy human adults. The allowance of 70 grammes of protein daily (1/2 of which should be of animal origin) recommended by the U. S. National Research Council and the allowance of 60 gms. recommended by the British Medical Research Council, are both too high apparently or it may be that vegetable protein combinations can be safely substituted for animal protein.—(From *Science*, 111, 1950).

SOME NOTES ON MALARIA*

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It is my intention to describe in the following notes observations with regard to some remarkable cases of malaria, its epidemiology and therapy, and to raise the question whether malaria has also certain beneficial effects. I made the observations at Yercaul, on the top of the Shevaroy Hills, 4,500 feet above sea level. The village is surrounded by coffee estates which have a yearly outbreak of endemic malaria in the late spring and early summer.

Disguised Forms of Malaria

The classical text book-forms of malaria do not usually present diagnostic difficulties, whereas disguised forms may often be misdiagnosed with grave sequelae. Scheube¹ wrote in his book: "The disguised forms of malaria offer an extreme variety. There is hardly any disturbance which malaria could not imitate. These disguised forms are comparatively rare. It is an amazing fact that from the worst tropical fever areas very few reports about the occurrence of such forms are published."

In over a thousand microscopically confirmed cases of malaria I have met with only two forms, "looking like something else."

CASE 1.—On the 23rd of December, a lady, aged 39, called for medical attention. She was known to be suffering for years from nose troubles complicated by sinusitis frontalis which occasioned surgical intervention long ago. She had never had malaria. For five days she felt distressed by fever attacks, anorexy and severe pains in the frontal region similar to those she experienced during her sinus infection.

The examination revealed: Temperature 101.4°F., slight apathy. The nose was flushed and somewhat swollen, her speech nasal, as in severe coryza (Stockschnupfen). Rami I and II trigemini were highly tender on pressure; tapping of the frontal sinus produced violent pain. No spleen enlargement. Lungs, heart, urine etc. were normal. Plasmodia could not be discovered in the blood smear. A.P.C. tablets were given, and infra-red rays applied without avail. The temperature rose to 103°F. After antibiotics the temperature went down with profuse sweating, to re-appear on the 30th; this time with shivering, goose-skin and a thermometer reading of 104°F. A new blood smear revealed abundant schizonts of tertian malaria. Anti-malarial treatment (Quinine and Atabrin) stopped further fever attacks. Uneventful recovery. The signs of neuritis, coryza and sinusitis disappeared simultaneously with the disappearance of the fever. Already on the 2nd of January she felt fit again. No malaria relapse to date.

* Specially contributed to THE ANTHERION.

COMMENT.—The patient's history, the clinical findings, the absence of malaria germs in the first thick blood film, and above all, the commencement of the illness at a period of the year where—on account of the low temperature—this place is always free of primary malaria, suggested the idea of a cold with sinusitis. Only the second blood examination, together with the effect of specific treatment, made clear the real nature of the malady. After the correct diagnosis was reached it was learnt that the patient had paid a brief visit to Bombay where she may have been infected.

It is presumed that the malaria caused irritation of the woman's locus minoris resistentiae—of her nose and sinus—thus imitating coryza and sinusitis. With regard to subtertian malaria, Manson-Bahr² writes: "It may markedly simulate other tropical fevers, and even surgical conditions." Russel and co-workers³ emphasize that pernicious malaria sometimes presents a clinical syndrome resembling that of acute appendicitis... Recently Morales and co-workers⁴ have met with cases of malaria simulating acute appendicitis (two cases were operated upon); only the positive blood smear and effective anti-malarial therapy led to the right diagnosis. Tertian malaria to which the above case belongs seems to ape surgical diseases only rarely. It must be kept in mind that, in obscure cases concerning people of, or from, the tropics, malaria may always be a possible cause of the complaints.

CASE 2.—1945.—A lady, 75 years of age, proprietress of a coffee plantation was physically and mentally astonishingly fit and very active. On the 18th of June, 1945, she fell ill and complained of diarrhoea with pronounced fatigue and weakness. There was the usual history of innumerable fever attacks since she lived at her estate, i. e. since about 50 years. She explained that very easily her guts were upset and that these had always been the only weak parts of her body.

The clinical examination did not reveal much. The temperature was normal the heart sound, the pulse regular: 90 per minute; blood pressure 140/90 mm. Hg. The spleen was just palpable, the urine free of pathological contents, the faeces free of worm eggs etc. but the blood contained rings of plasmodia vivax. She was given a course of Quinine and Quinacrine (Quinine Sulphate daily one gramme in divided doses for three days and then Quinacrine 0.1 thrice daily for 5 days). In spite of this no amelioration in the condition. Episodes of vomiting and diarrhoea with abdominal distress recurred with progressing intensification. Neither diet, nor enterovioform, or a locally found and usually very effective Aluminium Silicate powder could control the intestinal disturbances. A tooth abscess developed. Because of lack of real nursing and sufficient supervision it was decided to admit her to the Rainy Hospital, Madras.

From the brief hospital report I learnt the following: Patient arrived there on the 12th July, giving the impression of a deadly ill

person. She continued to vomit, had some temperature and stomach ache; all these cleared up after a few days, so that the necessary dental treatment could be given. From about the 22nd July, weakness, pain all over the body returned, and rendered her bed ridden. On the 25th, fever and again vomiting, and on the 28th development of slight jaundice without diarrhoea, but constipation. She was somewhat anæmic. During the first half of her stay at the hospital relative well-being changed repeatedly with gastro-intestinal attacks. The urine did contain some pus cells, but no motile organisms, albumin or sugar. In the feces no worm ova or other abnormalities. No malarial parasites in the blood. Some new growth was suspected, but stomach and intestine showed roentgenographically normal conditions. At the beginning of August patient eventually got a malaria episode and recovered slowly. After the discharge from the hospital at the end of August, although bodily reduced, she took up her usual duties, and in the course of several weeks she became her old cheerful self again.

1946.—On the 28th May the nasty attacks of last year came back. Three days prior to consultation she was suffering from backache, lassitude and malaise. The lower parts of the abdomen were tender, otherwise no objective findings: blood pressure was normal, no temperature. Malaria parasites could not be found in the thick blood film. She had semi-fluid motions on the first day of observation. Entero-vioform stopped the slight diarrhoea. The next day patient markedly improved.

On the 30th again loose motions of yellowish doughy faeces of neutral reaction against litmus. This time also no worms or amœbæ were present. Again rapid subsiding after anti-diarrhoeic medications, but prostration became progressively greater, and on the 1st June relapse of frequent evacuations, now associated with profuse vomiting. The onset was abrupt, the defecation became uncontrollable; it was impossible for the patient to retain the stools for even a few seconds. As each defecation was accompanied by vomiting, the lady was brought in an awkward situation. It was impossible to prevent soiling the bed linen. They had to be changed a dozen times within 24 hours. The stools were of watery character, faintly yellow, of enormous quantities. They offered an offensive smell. No suppression of urine, no muscular cramps. Next day, the 2nd of June, again a quiet day. On the 3rd recurrence of diarrhoea and vomiting. A new blood smear showed eventually a few, but typical schizonts of tertian malaria. Immediate beginning with systematic anti-malarial treatment under strict supervision. The 4th of June was uneventful, except for sleepiness and feebleness; on the 5th slight looseness of the motion, but no vomiting. Slow recovery, but on the 12th moderate vomiting. Microscopically the blood was free of germs. On the 20th, patient could again resume her work. During the whole observation there was never any elevation of body temperature.

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1947.—On the 13th of June she suffered from a similar, but lighter, attack of loose motions, combined with nausea, complete disablement, and no rise in temperature. The blood smear was positive for malaria tertian. Immediate institution of treatment prevented developments as experienced the previous year. Only one episode of vomiting and diarrhoea occurred in the night of 20th June. After reiterated Quinine injections complete recovery.

1948.—On the 3rd of May relapse of vomiting and diarrhoea with plasmodium vivax in the thick blood film. Quinine injections and a course of Quinine and Mepacrine were as effective as before.

1949.—In the fall of 1948 the lady sold her estate and left for the United Kingdom. She enjoys there a very good health, without having had a further attack of gastro-intestinal disturbances in the middle of the year.

1950.—According to her communication she suffered in the middle of this year from a very mild attack of malaria.

COMMENT.—Several points of this extraordinary manifestation of malaria should be stressed. The author was in the favourable position to follow up the patient for five years. It can be concluded from the presented history how difficult it may sometimes be to establish the diagnosis of malaria when the classical symptoms are missing, and the doctor is confronted with a so-called "clinical attack," unconfirmed by parasitemia. In the first year of observation the etiology of the gastro-intestinal appearances could not clearly be accounted for. They started with a tertian afebrile malaria followed by diarrhoea and vomiting which were apparently not amenable to any therapeutic measure. Improvements changed with impairment, but without typical periodicity (report from the hospital). In the course of weeks the symptoms subsided slowly, probably by nature alone.

Only the second attack one year later disclosed the true nature as to a disguised atypical malaria. Manson-Bahr² says: "Without the microscope the true nature of rare cases may be hard to recognize." But here the microscope failed at the very beginning, and the diagnosis was obscured by the negative findings. A verdict could not be given at the onset of diarrhoea due to the lack of fever, chills, and the absence of plasmodia. As in similar cases it took several days before pronounced rhythm could be confirmed.

Once started, periodicity alone leads to the right track, since to my knowledge no disease other than malaria shows tertian or quartan periodicity. The diagnosis was supported by the eventually positive blood smear and the effectiveness of the anti-malarials. Hence the diagnosis of atypical tertian malaria with apyrexia, periodically recurring signs of cholera nostras, and distinguished by paucity of parasites. The onset was slow, but the symptoms

grew in vehemence with each subsequent attack. On specific treatment recovery took place with some very slight recrudescences. The reason why the first attack took a prolonged course may be the insufficient intake of the prescribed drugs. The lady could not be checked up, but she insisted every time that she had strictly followed the prescribed regime. The experience that her malaria always assumed intestinal forms rendered it easy to control the disease and to prevent a turn for the worse in the years 1947 and 1948. The outbreak of her malaria in the months of May and June coincided at all times with the peak of the flaring-up of malaria amongst the estate workers. The fact that the patient got a light malarial attack in the United Kingdom two years after settling down there suggests the idea that the lady suffered from a dormant malaria which got superinfected yearly during her stay in India.

The attempt to classify this form of malaria raises difficulties. The text-books (Scheube¹, Manson-Bahr², Russel³ etc.) enumerate the following rare forms which have to be considered:

(1) *The algid forms*:—These are characterised by sudden collapse, sometimes without other symptoms, often, however, associated with bloody vomiting, muscular cramps, suppression of urine, and bloody stools and extreme coldness of the body. The skin becomes livid, pale and shrivelled, the pulse thready, weak, irregular with slow beats. According to Scheube this form is not intermittent: once it occurs it terminates in a few hours either in recovery or fatal syncope.

(2) *The choleraic forms*:—These are associated with symptoms similar to cholera, namely, profuse discharges, livid complexion, blue lips and nails, sticky sweat, muscular cramps in the limbs, loss of voice, suppression of urine. This dangerous form leads mostly to a rapid death. It is thought to be caused by accumulation of parasites in the capillaries of the guts.

Our case corresponds to neither of these two types nor to any in the literature, as far I can see. Extraordinary circumstances have to be supposed to create symptoms like those described above.

The cause may be found in immunising reactions to the infection. It may, therefore, be useful to touch briefly upon the question of malarial immunity.

Malarial immunity is still the subject of controversy. An absolute immunity does not seem to exist, as it does in certain virus or bacterial diseases. The malarial immunity is only relative and partial; it may be inherent or acquired. This latter immunity persists only so long as the "immune" person is continuously subjected to the influence of malaria. It is known that in countries where, for reasons of climate, malaria does not occur permanently, but periodically, this type of immunity is not found. The interruptions of malarial outbreaks by free intervals interrupts the

immunising process of the disease also. In their native lands, highly "immune" Aborigines, immune in their own country, lose their immunity rapidly when they leave the malarial parts. It seems that in endemic areas a kind of symbiosis between man and parasites exists. In such individuals the presence of the malaria parasites appears to have no influence upon the state of their health (Scheube¹).

The "immunity" against protozoas and metazoas seems to differ fundamentally from immunity against viruses and bacteria. Protozoas as higher organised organisms are evidently capable of producing defence bodies against noxae which may damage them, similar to those which the higher animals produce for their own protection. Then the following may happen: Man produces antibodies against the malaria germs, and the latter in return antibodies against the human defence mechanism. Thus in untreated or continuously freshly infected individuals, a permanent struggle between man and parasites takes place, resulting in gradual reduction of the severity of clinical symptoms, until a kind of "gentleman's agreement" is concluded, whereby both get accustomed to the mutual products of metabolism and defence bodies. This reciprocal action leads then to a real symbiosis. In syphilis, for instance, where new spirochaetes, when entering an already syphilized body, either succumb to the action of the defence measures without being able to do visible harm, or they have to live as parasites (in the real sense); whereas new intruders will have the power to develop properly and to cause new symptoms when the last of the first set of microbes have perished (Cf. Friedmann⁵). In malaria the same may happen.

The length of survival of *plasmodium vivax* within the human body is apparently limited. As a rule the asexual forms sojourn not longer than two to three years in the body, and they disappear either by action of the host or by death as result of aging. Hence it follows that a relative immunity outlasting this span of time can only be maintained by renewed infection; otherwise the immunity is lost.

The strange course of malaria in our case may find its explanation in such immunizing endeavours of the body to neutralize the actions of germs. By the numerous malarial infections patient has endured during a fifty year long stay at an endemically malarious place, the body gained a certain ability of attenuating the disease's syndromes. I imagine that her defence forces were able to keep the plasmodia in check by limiting their numbers. Since plasmodia augment by geometric progression more germs have to be destroyed with each successive schizogeny. What may happen when the body fails to combat the plasmodia can be seen in fatal cases before the end. The smears are crammed with germs like a pure culture.

With the destruction of the causative agents a certain amount of substances—be it toxins or foreign proteins—are liberated. These products may cause allergic sensitivity of the mucous membranes of the gastro-intestinal tract, or irritate it by direct local action during the process of elimination through the guts. The above considerations may give a clue to the absence or paucity of germs in the microscope, and the increasing severity of diarrhoea and vomiting in subsequent attacks.

The case demonstrates clearly the necessity of making repeated smears in order to detect parasites in suspected cases.

It has not been possible for me to check my hypothesis by laboratory investigations.

Other Remarkable Cases

CASE 1.—A boy, aged ten, was suffering from a dysenteric form of malaria. It is not my intention to describe the clinical aspects of this well-known variety of malaria as every text-book gives sufficient details, but the method of diagnosis may be of interest. The father brought me a sample of his son's bloody and slimy faeces. In examining the stools immense numbers of plasmodia vivax were discovered; the diagnosis was established without seeing the patient. Laboratories should bear this fact in mind when bloody motions have to be examined.

CASE 2.—A lady, 33 years of age, with typical uncomplicated malaria tertian.

For treatment she received one Quinine injection and for five days Quinine Sulphate, one gramme daily in divided doses, thereafter Mepacrine for three days, thrice 0.1 gramme, and then daily one tablet. Twenty-eight days after the commencement of the Mepacrine administration, development of numerous bright livid erythematous nodules from pea to hazel-nut size situated on the extensor surface of both legs. They were slightly elevated, had sharp margins, and were tender spontaneously and on pressure. They produced a sensation of heaviness impeding the gait. Erythema nodosum *ex usu mepacrini* was diagnosed. The case could not be followed up as the patient went to the United Kingdom. There the eruption healed after the lapse of about two months. In 1950 she was again suffering from malaria. She got this time only Quinine. No appearance of skin troubles.

COMMENT.—It is assumed that erythemata nodosa are no "entite morbide," but a "reaction cutanee." We know that different cases of erythema nodosum have different etiology: infectious or dermatotoxic. It can be caused by tuberculosis, syphilis, gonorrhoea, lepra, foci of infection etc., or by iodides, bromides, phenolphthalein, barbiturates, salicylates, arsenics, and pyramidons. I know of no report where malaria or Mepacrine have been accused of being

agents provocateurs for erythema nodosum. Malaria as the etiological factor of the case presented seems out of question, because at the time of erupting, the malaria was at least clinically cured, and the efflorescences appeared after one month's intake of Mepacrine. Drug eruptions attributed to Atabrin have been noted among military personnel taking Atabrin for malaria suppression. They are rare side-effects, as only one in several thousands of the men was affected (Sulzberger and Baer⁶). Among the syndromes Atabrin may produce, as enumerated by Sulzberger, the erythema nodosum is not mentioned.

A New Symptom of Malaria

Lately my attention was drawn to a symptom of malaria which seems comparatively unknown: burning sensation in the urethra during micturition. Aching of joints and generalized aching of the skin belong often to one of the main complaints of a malarial attack. So burning sensation in the urethra may be considered as part of the general hypersensibility of the body's surface. It has no connection with the concentration of urine. So far five patients confirmed this feeling when urinating. Further observations are still needed to learn the frequency of this symptom.

An Addition to the Epidemiology of Malaria

Much time and much intensive labour have been devoted to the study of the epidemiology and endemiology of malaria in order to find the necessary armours to control this scourge of mankind. In spite of this the desired goal has not yet been attained, and many obscure points have still to be investigated. It is well known that a multitude of interrelated factors have to be envisaged in order to understand the endemic and epidemic outbreaks of malaria. The most important factors I would like to quote briefly are:

1. *From the side of man*:—He is regarded as the "reservoir." There has to be considered (a) the infection rates among the population, the number of carriers of gametocytes, the natural or acquired immunity, the habit of living, the cultural standard. One main point is the understanding of control of the disease, the willingness of the population of a certain area to undergo early and systematic treatment and to complete the courses, to take to preventive measures etc., and (b) the presence of susceptible individuals (new hosts).

2. *From the geographical point of view*:—The local geographic and hydrographic conditions which are essential for breeding of anophelines as for instance: standing or running waters, altitudes of areas, their flora and fauna.

3. *From the climatic conditions*:—Intensity and length of sunshine, rainfall, humidity of the air, seasonal variation of temperature, the alterations between wet and dry seasons.

4. *From the side of the carriers: the anophelene mosquitoes*:—The species in a certain area, their density, their habits of feeding, breeding and resting, their suitability as carriers of plasmodia. To determine the degree of endemicity a large amount of statistical work must be done to obtain quantitative indicators. With regard to man the following have to be taken into account. The per cent incidence of splenomegaly in children up to nine years (spleen index); the per cent incidence of positive blood smears (the parasite index); the per cent of incidence of infection of infants under one year of age, etc.

Malaria surveyors have amassed quantities of important data, but many details and factors await further research. Thus at present about 160 certain species of anopheles, with at least 70 subspecies, varieties and races are known (Weyer⁷). They range geographically from the Arctic zones to the equator; of these about 50 species are to be considered as carriers of malaria. The surveys further showed the impossibility of making generalisations about the habits of anophelens. The living habits as well as the susceptibility to impregnation with plasmodia differ widely among the different species. Their relative abundance in different localities is known, their flight ranges, their feeding and breeding habits, habitats, the life span of many species, the mode of hibernation, and much more.

To ascertain the importance of a particular anopheles mosquito as transmitter, its susceptibility for plasmodia has to be studied. As indices two methods are in use:

1. *Determination of the experimental index of infection*:—Females of the manifold species, raised in laboratories, are fed upon human carriers of gametocytes. After a fixed time has elapsed they are dissected and the per cent incidence of oocysts on the stomach wall and sporozoites in the salivary glands are determined.

2. *Determination of the natural index*:—Large numbers of mosquitoes are captured, dissected and the per cent incidence of infected exemplars noted, whereby the incidence of sporozoites is the most important factor.

When the habits of life of man and the anopheles and the different indices are brought into reasonable correlation to one another, an approximate indicator to judge the degree of endemicity of the area in question can be found. Very often, however, these calculations do not correspond with the intensity of an epidemic or endemic. Imponderables and still unknown factors undoubtedly influence the magnitude of a malarial outbreak. A small number of anophelens, a low spleen index etc. are not sufficient to regard a locality as an unimportant centre of contagion: in certain circumstances a few anophelens are already enough to maintain permanently a severe epidemic (Scheube¹). Because the number of anopheles is often disproportionate to the vehemence of an epidemic still unknown habits of mosquitoes must, amongst other things, be

made responsible. *It seems that the sucking habits of the malaria vectors are too little studied.* I gained this impression from some observations.

Anopheles fluviatilis James 1902 is the principal transmitter in these hills. According to Weyer⁷ *anopheles fluviatilis* very frequently enter into houses. They prefer to bite man rather than livestock. According to informations kindly furnished by the Director of Public Health, Madras, the anthropophilic index of *A. fluviatilis* in some of the surveys done in the Wynaad area has been found to be around 95%. It is proved that they attack man eagerly. Their preference for the human is confirmed by several countings. In India proper they amount to 86% of all mosquitoes caught in houses. At first there was an inclination to underrate the importance of this species, but investigations in recent years have shown that their significance is a high one. Their natural index of infection (oocyst index) is 3.9% in the Madras Presidency. In comparison with the indices of *anopheles funestis* (10–18%), *anopheles gambiae* (30.2%) and others, their natural index is not very high. Estimated from personal impressions the density of the anophelens here is low. The spleen index is about 8%. Taking as basis the adopted rough classification to express the intensity of infection, this place ranges amongst the “healthy” areas (scale of Manson-Bahr²). Nevertheless at certain times malaria manifests itself in a strange manner. I am always astonished to observe localised outbreaks within certain families. I termed such events “family epidemics.” The visiting physician finds on his arrival a shivering, groaning and delirious community. The number of infected individuals in such a circle stands in no relationship to the average infection rate of the other inhabitants. It is to be emphasized that all the diseased members of such families are suffering from the same type of malaria tertian resp. sub-tertian. Some quotations may serve as illustrations:

CASE 1.—In a family, consisting of two—husband and wife—the tertian fever commenced on the same day. A gentleman next door had had his malarial attack two days previously. All the other neighbours were free of fever.

CASE 2.—A well-to-do family consisting five—parents and three children—were living in a pucca house, the bedrooms being near to one another. Tertian malaria developed within 24 hours and affected four members; the father alone was spared. The son who “opened the dance” showed considerably more parasites than the others. In the adjacent houses there was no malaria.

CASE 3.—A carpenter’s family of five sleep in one room of a primitive house. In 1945 the wife and two children got bouts of tertian fever on the same day. In 1949 the same family now numbering six heads fell ill on the same day with the exception of two children, this time with sub-tertian malaria. The two

year old daughter developed a fatal cerebral malaria*. At the neighbouring High School with about 200 pupils no malaria on these two occasions.

CASE 4.—The family of a photographer dwells in a badly built, primitive house. Of the six members four children showed the first ague of subtertian malaria on the same day, whereas the pregnant wife got the first attack four days later. In the families of the environment no case of malaria occurred.

CASE 5.—Of ten members of a woodcutter's family living in two dark rooms of a hut in the crowded village, five were prostrated with tertian malaria the same day. No other outbreaks in this part of the village.

Many such examples could be reported.

COMMENT.—In trying to find an interpretation for such incidences of "family epidemics" it was concluded that it would be unlikely to assume that by hazard a swarm of infested mosquitoes entered the dwellings biting and infecting simultaneously. This would be very much amazing on the score of paucity and the not too high natural infection index of *Anopheles fluviatilis*. I rather see the cause in the blood-sucking habits of that species of which little seems as yet explored. In the few text-books at hand which summarize the actual progress of knowledge—special articles I could not peruse—very little is mentioned about the blood-sucking habit of an individual mosquito. The principal investigations only determine the preferential feeding of the different species, whether they are more anthropophilic or zoophilic, or mixed feeders. In this connection an anthropophilic index has been worked out which indicates the percentage of mosquitoes filled with human blood, a maxillae index was established etc. Furthermore, interest was concentrated to find out the blood-thirstiness of different species of mosquitoes. As the observation of the biting-act is a lucky hit not much has been made known about it.

Scheube¹ (1903) in his detailed description of malaria, writes nothing about the feeding habits. Manson-Bahr² (1935) expatiates upon them:

"As the living habits differ widely among the different mosquito species, the blood-sucking habits may also". And at another place: "After piercing the skin the mosquito will fill herself in a minute or thereabout. She then withdraws her proboscis and flies heavily away to some sheltered spot to digest the meal.....The blood is gradually absorbed in the course of three to four days.....The mosquito is now ready for another meal."

* From my experiences cerebral malaria in infants below two years of age has always an infant prognosis. I have lost eight cases of cerebral malaria. One pregnant woman of 23, a priest of 55 and the others children below two years. All these cases came too late for treatment at a time when the cerebral symptoms had been fully developed.

According to him, a female mosquito feeds again three to four days after the first-blood-meal.

"About the sucking habits we know nearly nothing..... What the mosquitoes do after the feeding act is hitherto a scarcely entered new land..... Up to now the investigations have hardly taken into consideration the question of the blood thirst of the malaria vector. We solely know species which need only one blood-meal to bring a set of eggs to ripeness... ..For other species one feeding is not enough and they suck several times."

About the intervals between the several suckings no details are given.

Russel and co-workers³ (1946) do not express themselves in a clear manner. They state:

"When an anopheline species possesses tropisms which induce it to feed repeatedly on man it is certainly a potential malaria vector. The basic similarity between diverse anopheline species. . . is that they are all readily biting man repeatedly, however widely they may differ in other bionomic characters."

Considering the observations, reported above, the only deduction which can be drawn is that, at least for *Anopheles fluviatilis*, the main vectors in the Shevaroy Hills, several blood-meals are needed at short intervals, and not only one in three to four days as Manson-Bahr explains. The "family epidemics" may give some hints as to the number of feedings of an individual mosquito within 12–24 hours. It seems that *A. fluviatilis* bites at a minimum four to five times during a night, apparently selecting each time a different victim. This sucking habit explains clearly why *fluviatilis* without being present in abundance, are such important vectors. One admits, of course, that the question just raised required further investigation.

From different parts of the tropics it is reported that the natives are more often bitten than the white-skinned (Weyer⁷). Some observations may confirm this opinion. At evenings when mosquitoes form a real plague it can be seen that men in black evening dresses are surrounded by hundreds of mosquitoes, whereas the ladies in their light coloured garments possess nearly no power of attraction for these rabble shunning the light.

Is Malaria of any Benefit in Tropical Countries?

The ravages malaria takes of life, health, and the economic losses it causes are widely discussed by all workers in this line. That the disease may also act somewhat beneficially is not envisaged in the enormous literature. The natives are not much alarmed by malaria attacks. They take it as the Western world takes the yearly colds. They consume some Quinine tablets when they feel feverish, and that is all for the majority of the population. They do not think of making use of any prophylactic measure, or even of subjecting themselves to energetic treatment. They are not

"anti-malaria minded". So it comes about that, according to estimates, malaria in India takes an annual toll of 100 million infections, out of which only 10 million are treated. Certain beneficial effects may be found in this permanent endemic. There are in these hills villages with endemic syphilis where even the children are not spared. These syphilitics are rather indolent towards their disease. They consult the doctor only when the symptoms are molesting them badly and hampering their daily work. And then they follow treatment only as long as they think it adequate. In spite of the negligence on the part of the syphilitic, tertian syphilis belongs to the rarities. Tabes and general paralysis I have never encountered amongst the aborigines. Dr. H. S. Hensman of Madras confirmed my views with regard to the rarity of para-syphilis in this country. In this context it is interesting to note which parts of the world, as far as reports are available, are practically free of tabes dorsalis and general paralysis of the insane. So Maxwell says, that in China syphilis produces remarkably rare cases of these two sequelæ of syphilis; para-syphilitic diseases of the central nervous system are almost unknown in Palestine (MacQueen), in North Africa (Lacapere), in Africa (Sequeira), in Turkey (von Duehring Pasha), in the Balkans (L. Glueck)⁸. All these countries are known of being extremely malarious!*

The only case of tabes I heard of in these hills was a Eurasian who took all possible measures to be spared malaria.

The idea may not be too far-fetched that *endemic malaria forms a natural remedy against the late sequelæ of syphilis*, a natural Wagner-Jauregg treatment! When the anti-malaria campaign with D.D.T. etc. has been thoroughly and successfully carried out, it may have been shown whether this theory is right or wrong.

Concerning Treatment of Malaria

When the chemical industry lately bestowed on us Paludrine the manufacturers apparently thought of having eventually discovered a remedy which, against malaria, may play the same role as for instance Penicillin against the majority of coccal diseases. With the whole heart of propaganda intended for laymen and doctors, in advertisements, film and radio, and articles in newspapers, they claimed that Paludrine is superior to all known anti-malaria drugs. Often it is thus depicted as if this drug provides the much-desired 'therapia sterilisans magna.' All the literature in medical journals as well as that distributed by the firm is contradictory in itself. I

* It must be admitted that Hudson⁸ gives other explanations for these facts. He does not mention that the malaria may be the cause. According to him yaws, syphilis and other diseases caused by treponemata are no different diseases, but different patterns of the same malady which he terms "treponematosis". This disease presents different clinical appearances of lesions under different climatic and sociological conditions. Any variations in the parasite itself are functional in nature and represent strains, which may or may not have fixed biological characters. Hence due to the treponema pallida's faculty of adaptation to changes the predominating forms (eruptions over the whole surface of the body, main lesions in the folds of the body, cardiovascular accidents, or affection of the central nervous system etc.) vary with the countries of importation by environmental conditions. Thus tabes and paresis in certain countries may be a sign of such an adaptation.

shall quote some passages from Afridi's⁹ article, distributed by the I.C.I.: "Unlike Quinine and Mepacrine it was remarkably free from side effects* prolonged courses of 0.5-0.6 gramme twice daily for 14-28 days were readily tolerated *producing* only in the first few days some abdominal discomfort and vomiting. transient, but *marked toxic symptoms of diarrhœa and hæmaturia occurred* in two cases after one gramme of Paludrine as single dose. . . . It may also *produce urticaria, weakness, sleeplessness, loss of appetite, vomiting, sometimes associated with diarrhœa.*"

About the doses of Paludrine there exists great confusion. "A single dose of Paludrine (one or two tablets) controls the clinical symptoms of all forms of malaria and terminates the attack"¹⁰ "to obtain a radical cure of malignant tertian malaria 0.1 gramme three times a day for ten days should be given; this treatment can be shortened, if so desired, by giving larger doses over a shorter period"¹¹. No hints are given as to optimum doses. It is noteworthy to mention that lately the I.C.I. recommends combined courses of Paludrine and Mepacrine!! Although Paludrine lactate can be given intravenously, intramuscular Mepacrine or intravenous Quinine should only be employed for treatment of dangerous, pernicious types of malaria.¹² And herewith falls the nimbus of the claim that Paludrine "is superior to all known anti-malaria drugs."

What is the opinion of the sphere outside of the I.C.I.? Mægraith and co-workers¹³ state that Paludrine has no greater effect on relapses than Mepacrine, and that it is apparently less efficient than a combination of Quinine and Pamaquin. In an editorial in the *British Medical Journal*¹⁴ it is asserted that Paludrine at weekly intervals after an initial single therapeutic dose will suppress relapses so long as the weekly dose is sustained; the exo-erythrocytic forms are inhibited, but eradication does not regularly occur.

I shall conclude here my quotations. But such is the tenor of most of the literature I received. It can, therefore, be concluded that Paludrine, as a therapeutic, possesses no advantages over the good, old Quinine, and the younger Mepacrine (the latest Bayer product Resorcin I have not tried as yet). Paludrine may be useful as prophylactic by destroying the pre-erythrocytic forms of plasmodia, but I cannot vouch for it, lacking the necessary experience.

Already after my first trial with Paludrine I gained impressions similar to those quoted above. I compared two cases of tertian malaria, starting at the same time with approximately the same germ contents in the blood films; the one has been treated with Paludrine (0.3 gramme daily), the other with the routine, and hitherto beneficial Quinine treatment. The Quinine patient felt considerably improved the next day, and was spared from fever relapses; on the third day the plasmodia had disappeared from the blood. The Paludrine patient felt miserable, was anorexic, complained of drowsiness,

* Italics are mine.

and did not want to leave his bed even for his evacuations. Three days later he begged me to refrain from giving him these tablets any more. He asked for the treatment he had received three years before. The Quinine course put him subjectively well on the day after commencement. The schizonts which were still present on the third day disappeared shortly after Quinine.

Other patients who took Paludrine prior to consultation made similar complaints of malaise etc. Two typical examples :

CASE 1.—A 40 years old butcher was for ten days suffering from tertian fever attacks. Persuaded by Paludrine propaganda he took daily one tablet, in toto 10 tablets. Examination revealed : Temperature 102° F, spleen palpable (size 1-2 of the scheme given by Russel³, malaise. In the blood : schizonts. On Quinine he was much relieved the following day. No relapse, but 14 months later new infection.

CASE 2.—A girl, aged 8 years, was suffering for one month from tertian malaria. The last ten days she took daily two Paludrine tablets. The last two, the day before consultation. No improvement. At consultation : no fever, but typical distinct schizonts of plasmodium vivax, and enlargement of the spleen. Quinine treatment brought rapid cure. I only had occasion to test the blood again 12 days later. It was free of germs.

Individuals suffering from malaria wish a quick clinical cure from the nasty attacks and from their ill-feeling, and this effect according to my experiences, Paludrine does not achieve.

From a theoretical point of view Paludrine which is synthesized on quite new principles, deserves full attention, but the general practitioner should be cautious in its therapeutic use.

Summary.—Two cases of disguised malaria—one imitating sinusitis frontalis, the other imitating cholera nostras—are described and commented on. An example of erythema nodosum as side effect of Mepacrine is given. Burning sensations during micturition is spoken of. It seems that the malaria vector, anopheles fluviatilis, the main representative of the anophelines in India, sucks blood 4-5 times during a night, causing "family epidemics". Endemic malaria seems to hamper outbreaks of tabes dorsalis and general paralysis of the insane in syphilitics. The new drug Paludrine offers apparently no advantages over the previous remedies against malaria.

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TETANUS—OBSERVATIONS ON THE TREATMENT OF *

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I WAS in charge of the Tetanus Wards of Sir J. J. Hospital, Bombay, in the year 1936. The routine treatment of tetanus then in vogue was to give intrathecal (by lumbar and cisterna magna puncture), intra-muscular and subcutaneous injections of tetanus anti-toxin as recommended by Bruce for acute cases.

Day	Subcutaneous units	Intramuscular units	Intrathecal units
1st	...	8,000	16,000
2nd	...	8,000	16,000
3rd	...	4,000	8,000
4th	...	4,000	8,000
5th	...	2,000	—
7th	...	2,000	—
9th	...	2,000	—

Dr. B. B. Yodh, M.R.C.P. (London), the head of the Department, was working in this direction and investigating the advantages of curative line of treatment with intravenous administration of serum discarding the intrathecal route. The doses of serum recommended then were 80,000 I.U., I.V. of tetanus anti-toxin and 40,000 I.U., I.M. on the first day. On the second day 40,000 I.U., I.V. and 20,000 I.U. I.M. This was continued for a period of 5 to 7 days.

I gave in these days 2 lacs units of tetanus antitoxin diluted in about 200 c.c.s. of Glucose saline intravenously by drip method as the first dose as this was the recent advance in medicine then. I cannot say about its results in 1936 as I used it in only 3 serious cases, two of which were fatal and one survived.

Symptomatic treatment.—For control of spasms full doses of Chloral and Bromide orally and per rectum were administered. R Chloral Hydrate grs. 15, Pot. Bromide grs. 10. Tinct-Belladonna ms. 5, Aqua. Mentha Pip ounce 1, ounce 1 4th hourly. R Chloral Hydrate grs. 20, Pot. Bromide grs. 30, Mucilage Amyli ad ozs. 2 to be injected per rectum instead of rectal enema of Chloral and Bromide, Paraldehyde drs. 3 to 4 in 2 to 4 ounces of Normal Saline was given by drip method. Injections of Mag-Sulph 25% 5 c.c. and Morphine Sulphate 1/4 gr. were also given for control of spasms.

In the year 1944 I had an opportunity of observing the cases of tetanus being treated in the 58 Indian General Hospital at Manipur in Assam during World War II. The treatment adopted was as follows :—

* Paper read before the 5th Gujarat and Sourashtra Medical Conference held at Nadiad on 31-3-1951.

(1) *Administration of tetanus antitoxin*:—A massive dose of 3 lacs units I.U. of serum was administered slowly intravenously. No serum was administered after this—but if recovery was not taking place 50,000 I.U. was administered after 5 days and again a week later. Adrenalin Hydrochlor (1:1000) was always kept ready for use in anaphylactic shock if developed.

(2) *Treatment of the wound*:—This was delayed at least for an hour after the I.V. administration of serum. With a view to render unsuitable for the proliferation of anaerobic organisms, the wound was opened widely, foreign bodies if any removed, loose tags and portions of necrotic tissues were excised and it was packed with H_2O_2 gauze with free drainage. In a deep wound carrel tubes were left *in situ* for intermittent irrigation with H_2O_2 .

(3) *Control of muscle spasms*:—Morphia was sometimes used. Avertin was also used (*vide* Tribromethanol below). In a severe case $CHCl_3$ inhalations were also tried.

Injection of Paraldehyde 5 to 10 c.c. I.M. once or twice a day were being administered.

(4) *General treatment*:—Patient was treated in a corner (if available in a single room) protected from light and noise and disturbed as little as possible. Fluids were administered in large quantity and were sucked by a rubber tube. Fluids and fluid diet may be administered by mouth and stomach tube (during Narcoosis.)

The inadequate administration of serum to patients suffering from tetanus was a feature noted by me in some hospitals. It may be that the financial difficulties may be responsible for this.

I used to inject 3 lacs I.U. of tetanus antitoxin diluted with Glucose 100 c.c. 25%, 25 to 50 c.c. of 50% Glucose and 50 c.c. of Normal Glucose Saline slowly intravenously using the bivalve adapter (B.D.). I found that the patients did experience uneasiness during this injection and immediately. I used to inject 0.5 c.c. of Adrenalin Hydrochloride 1:1000 intramuscularly. After this experience I injected 0.5 c.c. of Adrenalin Hydrochloride 1:1000 I.M. or S.C. 10 to 15 minutes before the I.V. administration of serum by the bivalve adapter.

There was always a fear at the back of mind that acute anaphylaxis would be dangerous if developed and hence as precautionary measure I used to inject 20,000 I.U. of the antitoxin intramuscularly over and above 0.5 c.c. of Adrenalin Hydrochlor 1:1000 in the hope of preventing anaphylactic shock. With this procedure patient did complain of uneasiness during the injection of serum but all was well soon.

In 1950 with all the precautions mentioned above I lost one patient of tetanus due to anaphylactic shock. Immediate injection of Adrenalin Hydrochlor 1:1000 subcutaneously as well as intracardiacally were given and Coramine was also given by the same routes.

There is a proverb in Gujarati "*Dudhano dajyo-chhach funke pive*", one whose lips are burnt by a hot-milk tries to cool his butter milk. In the same way I am now treating the cases of tetanus with antitoxin very cautiously. I follow the following procedure before administration of the serum intravenously. I carry out the intradermal skin test and the ophthalmic test for sensitivity to horse serum.

Intradermal test: 0.1 c.c. of 1 in 10 dilution of the therapeutic serum to be injected is injected intracutaneously into the flexor surface of the forearm. Positive reaction is indicated by rapid enlargement of the primary elevation which becomes urticarial in appearance surrounded by a zone of erythema in about 5 to 20 minutes. A wheal 1 centimeter in diameter surrounded by an erythema is significant. Pseudopodial extensions of the central wheal are evidence of the dangerous degree of sensitivity. If the test is negative the elevation due to injection disappears in a few minutes and such cases are quite good for intravenous serum administration.

Ophthalmic test.—After everting the lower lid of one of the eyes a drop of undiluted therapeutic serum is placed into the conjunctival sac. Positive reaction is indicated by itching, burning, congestion and lacrymation appearing within 15 to 20 minutes. A drop of Adrenalin Chloride 1:1000 placed in the conjunctivæ relieves the symptoms. Positive ophthalmic test indicates dangerous degree of hyper-sensitivity and all precautions must be taken in such cases.

Desensitisation of serum sensitive patients should always be done before administering the full doses of therapeutic serum. In mild skin reaction and negative ophthalmic test 0.5 to 1 c.c. of anti-serum is injected two hours before the administration of therapeutic dose. In severe skin reaction and positive ophthalmic test 0.1 c.c. of serum is injected subcutaneously. This dose is doubled every half hour till the full amount is administered. After this preliminary desensitisation subsequent injection of the serum can be given by intravenous route.

Even when these two tests are negative I inject 0.5 c.c. of Adrenalin Hydrochloride 1:1000 subcutaneously and I inject 40,000 units of Tetanus antitoxin intramuscularly and then 2 lacs I.U. of antitoxin intravenously diluted in 1 pint of Normal Glucose Saline by drip method. I have now discarded the bivalve adapter for this purpose.

Even with the negative skin and ophthalmic test and the precaution taken, in one case urticarial wheals developed all over the body with uneasiness during the process of intravenous infusion of serum by drip method. The intravenous drip was discontinued and the remaining amount was administered S.C.

On the second day I inject 80,000 I.U. of serum intramuscularly thus completing 3 lacs and 20,000 I.U. of serum in 24 hours. If

the condition of the patient is progressing well I do not give serum daily. If the symptoms are not cleared I inject 1 lac I.U. of the serum well diluted in 300 c.c. of normal Glucose saline intravenously using the bivalve B.D. adapter on the 5th day. This is the routine administration of serum which I follow. But in a very severe case I inject the serum on the 1st day as above, on the 2nd, 3rd, and 4th days I inject 1 lac I.U. of serum intramuscularly daily and on the 5th day 1 lac I.U. of serum as mentioned above. Usually the serum can be omitted on 2nd, 3rd and 4th days unless the case is very serious.

If the serum is standardised as per the international unit which was adopted on 1st July 1950, half the above doses will suffice. Thus the 1st dose will be 1 lac I.U. (1950) intravenously on the 1st day and 50,000 I.U. (1950) intravenously on the 5th day. Before any operation of the wound 25,000 I.U. (1950) of serum should be injected.

In order to avoid the anaphylactic shock it is better to use highly concentrated sera like Tetanus antitoxin 20,000 I.U. in 4 c.c. (Haffkine Institute) or 10,000 I.U. (1950) in 2 c.c. of Burroughs Wellcome & Co.

Control of spasms.—Mag. Sulphate 25% 10 c.c. intravenously twice a day. Paraldehyde 10 c.c. intramuscularly twice a day. Cardinal Sodium 3 gr. in 1 c.c. (M.B.) diluted with Glucose and slowly given intravenously (not tried by me). Tribromethanol (15–25 mg/kg. of body weight or 1/8–1/6 gr. 1b) rectally every (6 to 8 hours) (not tried by me). In severe cases Morphine Sulphate 1/4 gr. twice a day.

The recent advances in the treatment of spasms are the use of two drugs viz., Myanesin (B.D.H.) and Tubarine (d-Tubocurarine chloride, B.W. & Co. or Abbott).

Myanesin (Mephenesin-a; b-dihydroxy—(2-methylphenoxy propane) 10 c.c. of 10% solution intravenously 2 c.c. per minute every 3 to 4 hourly. For children it should be injected intramuscularly, the dose being age/2 plus 1 c.c. for each injection. Even in adults 5 to 10 c.c. intramuscularly serves the purpose. I have the personal experience of the intravenous route and the relaxation is immediate and marked. The disadvantages of Mephenesin intravenously are venous thrombosis at the sight of injection and hæmolysis. Schlenker *et al* (1948) recommend the use of 2% Mephenesin in normal saline to avoid these complications.

Tubarine.—Dr. J. T. Bhatt, M.B., B.S., D.T.M.H., Asst. R.M.O. and Dr. J.R. Joshi, M.B., B.S., C.M.O., Sheth V.S. Hospital, Ahmedabad, have reported to me that the results of Tubarine injections are excellent in controlling spasms of tetanus. The dose used by them is 5 mgm. three times a day intramuscularly for 4 to 5 days. I had the opportunity of getting this drug for one patient of tetanus in

February 1951. I injected 7.5 mgms. 12 hourly for 2 days and then 5 mgms. three times a day for 5 days. In all I used 115 mgms. of Tubarine in this patient. The relaxation was much more prolonged than Myanesine.

The patient did feel a sensation of paralysis after this dose but no further treatment was necessary for this. Tubarine is very useful to relieve muscular spasms in cases of tetanus with the above dosage.

Chloral Hydras, Pot. Bromide and Paraldehyde are also used per rectum.

OTHER DRUGS.—Penicillin 2½ lacs units intramuscularly twice a day every 12 hours for six days.

Nourishment:—By intravenous fluids if required and orally plenty of fluids and fluid diet.

General management:—Absolute quietness with minimum of stimulation in a shaded room.

During the Conference Dr. R. K. Desai, M.D., Surat, suggested the following recent advances in the treatment of tetanus:—

(1) *Procaine Hydrochlor*:—1 gram in 1000 c.c. of Normal Saline with 2 lac units of tetanus antitoxin intravenously.

(2) Infiltration of A.T.S. around the wound. I have adopted this routine since then. Over and above this I infiltrate the wound with 5 to 10 c.c. of Penicillin solution 5000 units to 1 c.c.

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Influence of Sexhormones on Hardness of Hearing due to Old Age

Dr. Kwath of the Stuttgart General Hospital reviews the literature relating to the use of sex hormones to improve defective hearing due to old age since 1936. The earlier findings on this treatment had raised the question whether the improvement in hearing was due to the hormones counteracting the subjective ringing sounds in the ear or whether the perceptive acuity was definitely and actually improved, particularly in the region of the upper frequencies. Kwath administered sex hormones to elderly men and women who were free from ear noises. There was definite subjective improvement in hearing and audiometric tests likewise confirmed this finding.—(*New Med. Welt*, 1, pp. 374–377, 1950).

INDIGENOUS DRUGS USEFUL IN DISEASES OF CHILDREN*

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Sadapa.—This drug is used as a house-hold remedy for children's ailments in our country. Botanically it is called *Ruta Graveolens* (R. *Angustifolia*). It is a plant belonging to genus *Rutaceae*, and is a short tender fragrant herb commonly cultivated in Indian gardens and in croton pots. Its names in different languages. English: The Garden Rue; Sanskrit: Sadapaha; Hindi, Persian, Arab and Guzarat: Satap; Bengali: Ispand; Telugu: Sadapa; Canarese: Sadapugida.

Description:—Leaves pectioled, decomposed segments ocreate, spithulateoblong or linear-oblong. Flowers in divaricately spreading corymbs; pedicles longer than the capsule; bracts lanceolate. Sepals triangular, acute petals oblong-obovate, pectinate, abruptly clawed. Capsules obtuse, shortly pedicled. Seeds angled.

Distribution:—Cultivated throughout India, Westwards to the Canaries.

Action:—It is used as a stimulant, expectorant, anti-spasmodic and anthelmintic in infants and children. It is also said to be a valuable restorant, diuretic and emmenagogue.

Therapeutic uses:—In bronchitis and pneumonia the juice of the drug is given in 10 to 30 drops doses mixed with honey. In cold and cough in children fresh juice of the leaves of this drug and the leaves of *tulasi* are given with honey. Fresh juice is more effective than in any other form. A decoction of the dried leaves (when fresh leaves are not available) may also be used for children in the above said conditions. The leaves may be used for fumigation in nasal catarrh and cough in young children. The powder of the dried leaves of Sadapa, black pepper and cardamom seeds mixed in equal quantities is used to act as a carminative and it is a remedy for dyspepsia. Dose 2 to 5 grains.

According to Ayurveda the plant is bitter, laxative, heating to the body, removes *kapha* and *vata*. According to Unani the plant is tonic, digestive, diuretic, emmenagogue, abortifacient, anti-aphrodisiac, heats the body, increases mental activity, useful in gleet and urinary discharges. When fresh its topical action is acrid and if much handled it produces redness, swelling and even vesication, Krihikar and Basis recommend that it may be given internally in amenorrhoea, epilepsy, flatulent colic, etc. and externally as a rubefacient. They opine that the oil is the best form of administration, but rue tea (decoction) is a popular remedy.

* Specially contributed to THE ANTHELMINTIC.

The herb and the oil act as stimulants, chiefly of the uterine and nervous systems. Rue in all its forms is considered injurious to pregnant women.

A tincture made with fresh leaves is used as an external remedy in the first stages of paralysis. In the Punjab, the leaves are used as a remedy for rheumatic pains. In the Central Provinces the leaves pounded with salt and applied locally for scorpion sting, though Cavis and Mhaskar declare to the contrary.

Rue is used by Arabs in Palestine and Syria as a preventive for the ill-effects of water drunk at unaccustomed springs; they either chew the leaves, or soak the plant in water and drink that water (Fullerton).

The plant is used as an emmenagogue in Indo-China and the seeds are considered a good ascariocide in Annam. The Chuanas and Kwenas administer a decoction in large doses to ease childbirth.

In Transval a syrup made with the infusion of the leaf is used for cardiac asthma, and the bruised leaf is given in jaundice and infantile diarrhoea. Commercial oil of rue does not appear to be effective as an anthelmintic. The higher boiling fraction acts as a fairly potent vermicide to hookworms, but is ineffective for removal of ascarides (Caius and Mhaskar.)

This plant has strong antispasmodic properties; the juice is generally prescribed on the West Coast in convulsions of children and in acute bronchitis and pneumonia. The juice undoubtedly possesses antispasmodic and expectorant properties. I have found it useful in the bronchial catarrh and the acute bronchitis of children (Koman).

A light decoction of the dried leaves of the drug may be used as an enema in flatulence and colic. The decoction may be given orally too in these cases. Fresh leaves are ground well and made into a paste. This paste mixed with a little brandy and applied externally relieves nervous pains (Nadkarni). An infusion of this drug is used for respiratory and heart diseases.

When given orally it is considered by house-holders, as a substitute for musk to maintain the bodily temperature.

The drug is added to water, poured into a still and condensed vapour extracted by distillation. Just as rose water or omam water, it is freely used for children and youngsters as a carminative and stimulant. During distillation the drug yields a small quantity of volatile oil.

It is generally used in cases of hysteria in combination with the powder of Jatamamsi (*Velernates*) and Aswagandha.

The powders of the above three drugs are mixed in equal quantities and given with water, milk or honey. (Dose 10 to 20 grains). A tincture prepared with this by adding the pieces of this plant and rectified spirit and kept for over a fortnight and filtered can be used internally as a expectorant and carminative (Dose 1 to 5 drops for children). It can also be applied externally on inflamed areas.

Fresh juice of the plant and pure honey are mixed in equal quantities, kept undisturbed for one month and then filtered and taken. (This is called Asawa preparation). Dose $\frac{1}{2}$ to 1 teaspoonful.

In South Africa the decoction of the leaves is used in fevers. In fits and convulsions of infants and children the leaf juice is given.

The fresh leaf crushed into a soft paste and placed in the hollow of the tooth in tooth-ache. In ear-ache too, the mass of bruised drug is placed in the ear hole. Sometimes, when in extremis, children are bathed in a decoction of the plant; and this is credited with producing recovery (Basu and Kirtikar).

This drug deserves special study and pharmacological investigations in view of its highly useful nature, specially in children.

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Protective Vaccination Against Tuberculosis with Special Reference to BCG Vaccination

After a historical resume of the various attempts to control the tuberculous process by vaccines, Aronson describes the development of BCG and the criteria by which its value may be determined. He bases his observations on the now well-known study of the results of BCG vaccination of large groups of Indians living on reservations in various parts of the United States and Alaska. He describes in detail the measures used to determine its effectiveness in a population having a high morbidity and mortality rate and compares the results with data obtained from comparable controls living in the same environment.

In this study freshly prepared BCG vaccine was administered to 1,551 American Indians ranging in age from 1 to 20 years and to 123 newborn infants. The control group consisted of 1,457 Indians and 139 newborn infants. Both groups were followed over a period of from nine to 11 years by means of tuberculin tests and roentgenograms; the newborn infants were followed for six to eight years.

During this period, among the vaccinated subjects there occurred a total of 55 deaths, six from tuberculosis. Among the controls there were 109 deaths, 53 from tuberculosis. Among the vaccinated newborn infants seven died, none from tuberculosis. Among the controls, 15 died; four characteristics of primary tuberculosis occurred in 22 of the vaccinated and 120 of the unvaccinated subjects. Evidence of more advanced tuberculosis was found in 21 of the vaccinated subjects and 93 of the controls.

Accumulated data, both experimental and clinical, indicate that an initial infection with viable virulent or attenuated tubercle bacilli induces increased resistance to reinfection with virulent bacilli. There is, therefore, a sound basis for the use of the attenuated viable BCG strain of tubercle bacillus as an immunizing agent. There is room for difference of opinion as to the advisability of the universal use of the vaccine. Its use is indicated, however, in areas where morbidity and mortality from tuberculosis are high and where facilities for care are inadequate. Its use is also indicated in the case of medical personnel and others who are tuberculin negative and who may be exposed frequently to tuberculous infection.—Joseph D. Aronson, *Am. Rev. Tuberc.*, 58:255 (Sept.) 1948.—*American Journal of Diseases of Children*.



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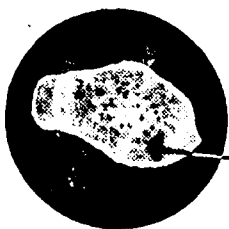
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Cases and Comments

NEONATAL JAUNDICE

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It is noticed that the physiological jaundice occurs in nearly 50-60% of new-born infants on the second or third day of birth. This comes to normal within 3-4 days without any treatment. In other infants, we can observe paleness coming to normal gradually. Physiological jaundice is more marked in premature infants. This may be due to functional immaturity of liver. There is also some supposition that physiological jaundice might have been caused by iso-immunization against blood grouping factors. But experimentally there is no correlation between physiological jaundice and incompatibility of Rh factor. Clinically also we do not find this physiological jaundice occurring in all infants of the same parents.

But it is possible that the syndrome of icterus gravis neonatorum might be resulting from iso-immunization against Rh factor. In such conditions, the jaundice gradually deepens. Calci Osteloin, Liver Extract and Vit. C parenterally help a great deal in reducing infant mortality and morbidity to some extent. Mothers' whole blood is given to infants parenterally but hypothesis of such line of treatment does not sound good if it is supposed that this condition might have been caused by incompatibility of the Rh factor. The treatment is based on sensitization to unknown factors. But here it looks that the body instead of being sensitised to this unknown factor may increase more the incompatibility of Rh factor.

CASE REPORT — 7th para, having all previous children living, all females, delivered one female baby. The child was full term and healthy but was deeply jaundiced at birth. Mother was anæmic during pregnancy and had received treatment for that but had the history that she used to get reaction for Liver Extract when given parenterally irrespective of any firm. The child and mother were given the usual treatment. After a few days the jaundice disappeared but the child became extremely anæmic which would not respond to any line of treatment. Liver and spleen were markedly increased and the child died after five months. She was never given mother's milk but was given top milk.

This case shows that the condition might have been caused due to iso-immunization against Rh factor. In the maternal blood, there are "cold auto-antibodies" which can cross the placental circulation and may be attached to the red blood corpuscles of the fetus. Jaundice that became deeper and deeper afterwards, may be due to the fact that the activities of these cold auto-antibodies might have been facilitated after birth by the precipitate entry of the infant into an environment colder than that of the uterus.

The question that arises against this hypothesis of Rh factor, is why this particular condition should happen in this particular pregnant state and not at any time before when the same patient had given births to previous healthy babies. It is a fact that these auto-antibodies are universally present. They may be lying dormant in her previous pregnancies and due to their activities during this pregnancy, due to some unknown factor, they might have been able to cross the placental circulation and attach to red blood corpuscles of foetal circulation, giving rise to this grave condition.

In this particular case, jaundice disappeared after a few days by the treatment of Liver Extract, Choline, B complex, Calcium with Vit. "D" and "C" but the child became anæmic with enlargement of liver and spleen. This anæmic condition may be due to A B O blood group incompatibility resulting in hæmolytic disease. Such

incompatibility, does at times produce a definite clinical condition resembling such condition. It is true that A B O incompatibility between mother and foetus has a sparing effect on Rh response and reduces the risk of Rh sensitization where Rh incompatibility is present.

SUPERFICIAL PUNCTATE KERATITIS, AS SEEN IN BOMBAY

K. S. GHASWALA,
Ophthalmic Surgeon, Bombay.

It has been noticed that with the commencement of the monsoon, we begin to get cases of what is known as "Superficial Punctate Keratitis" (not "Keratitis Punctate" or "K. P.").

The history of the patients, the signs, symptoms and the progress of the disease are so very characteristic, and differ from those described by Prof. Fuchs and others, not being fully described in text books, that I think the following notes with illustrative cases may be of some use to the students of ophthalmology and general practitioners.

History.—The patients complain of irritation in one or both eyes, and feel as if some foreign body is in the eye though they do not remember any having gone into it.

SIGNS AND SYMPTOMS.—If the patient is seen on the first day—which is rarely the case—there is nothing more than ordinary conjunctivitis, no punctate spots nor ciliary injection being noted. On the 2nd or 3rd day there are a few punctate spots at the periphery, not easily seen by oblique illumination but well seen after the cornea is stained with Fluorescein, and slight ciliary injection. If seen on the 4th or 5th day we see several gray spots over the whole of the cornea, marked ciliary injection, irritation and some photophobia. The spots are very well seen after being stained with Fluorescein. In the cases coming to us we rarely see the disease on the first day; as for the first day or two the patient attributes the redness of the eyes or eye to some dust having gone into it and has probably treated himself for conjunctivitis. Most of the cases come to us on the 3rd and 4th day of the complaint.

Fuchs in his Text-book on Ophthalmology says that the punctate gray spots always cover the centre of the cornea and the periphery of the cornea is the part least affected, but in the cases that have come to me I have noted that the spots commence at the periphery and go on increasing towards the centre until the whole cornea is involved.

The spots are on the superficial layers of the cornea and, when well marked, form as it were a kind of eruption of sub-epithelial foci of infiltration.

Causes.—Fuchs and others say that it follows influenza and acute affections of the throat; but in my cases I have hardly heard of these affections complained of by the patients. Noticing that these cases come with the commencing of the monsoon, it is quite probable that climate has some influence in the production of this complaint. It is generally found in young persons, more in males than in females—perhaps because the former are more exposed to the wind, dust and rain. It affects one or both eyes. The late Lt. Col. H. Herbert, I.M.S. found a bacillus which he thought causes this complaint. This bacillus resembles Friedlander's pneumo-bacillus and is known as "Herbert's Bacillus."

COURSE AND PROGRESS.—The disease lasts for nearly 2 or at the most three weeks after which complete absorption of the spots takes place and the eyes are again quite normal. When both eyes are affected, each eye runs a separate and self-limited course independent of the other eye, thus suggesting, a bacillary invasion.

Case 3.—Hinlu, male, aged 19, came with the following history :—The right eye is irritable and red for the last five days. He feels as if a foreign body is in the right eye but does not remember when the foreign body went into the eye.

On Admission:—There is punctate staining of the whole cornea; marked ciliary injection and photophobia.

2nd day of admission, i.e., 7th day of commencement:—Condition the same except the photophobia which is less.

3rd day:—Very few spots are staining.

4th day:—Only one spot about the centre of the cornea staining very slight injection. No photophobia.

5th day:—No staining of cornea, no ciliary injection.

TREATMENT.—As in the other two cases.

Case 4.—Christian, male, aged 20, came complaining that his left eye has been red and irritable for the last 3 days.

On Admission:—There was marked staining of the whole of the cornea and ciliary injection in the left eye.

Under the above treatment the spots of staining gradually disappeared until on the 18th day of the commencement of the disease the eye was quite normal.

97, Queen's Road, Fort Bombay.

CHLOROMYCETIN AND WIDAL'S TEST

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

AND

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

The Nursing Home, Vaniyambadi, North Arcot, S. India.

THE minimum quantity of Chloromycetin required to negative Widal's Test has neither been ascertained nor reported so far. We take the liberty to place on record our findings in this regard.

This brief report is based on a series of seven cases of typhoid treated in our wards with Chloromycetin. These were the contacts attending on confirmed cases of typhoid fever, and who were not protected by anti-typhoid vaccine.

We do admit that the number of cases reported is too small to formulate any definite and final opinion on the subject. But we hope that it will be of interest to those working in this field.

Our diagnosis in these cases was based on clinical grounds and our observation. In view of the contagion to which they were constantly subjected to it was considered that Widal's Test was not quite necessary to confirm the diagnosis. As a routine every patient was thoroughly examined; hæmatologic examinations; red blood and white blood counts were made and found to be in normal range.

Owing to the short supply of Chloromycetin during the period under report the patients could not get more than 2 vials of it at a time, and by the time the remaining required quantity was obtained there was a lapse of 3 or 4 days in the continuation of the treatment.

It was during this period when Chloromycetin was temporarily suspended that certain profound changes were observed. The foremost amongst them being a secondary rise of temperature which piked up at an average of about 33 hours after the cessation of the drug. Blood was withdrawn on the subsequent day of the rise of temperature for Widal's Test. This was done more for our interest rather than for clinching our diagnosis. It was interesting to note that the

laboratory report in every case was "negative to typhoid and para-typhoid." Unmindful of the laboratory findings Chloromycetin was continued till the temperature touched normal continuously for some days.

We append herein a concise chart of the cases treated, from which one can deduce that (1) the results obtained with smaller doses of Chloromycetin are equivalent to, if not better, than those derived from the conventional heavy doses and; (2) that in every case the Widal's test was negative after the administration of 24 kapseals.

It appears that a certain amount of concentration of Chloromycetin in the blood for a certain period of time, is all that is necessary to effect a cure in typhoid and large doses of it seem to be not only unnecessary but also harmful. Symptoms like cephalalgia, diarrhoea, anaemia, vomiting, urinary retention, sudden circulatory failure, skin eruptions and various other cerebral symptoms observed by a number of clinicians were not found in any one of the cases.

CHART No. 1.

CASE No								
1.	Age in years	27	45	30	32	40	25	22
2.	Duration of fever before admission	8	12	9	10	7	7	8
3.	Toxic symptoms during admission	D	Pe	Pe	—	D	D	—
4.	Malaria	Nil	Nil	Nil	Nil	Nil	Nil	Nil
5.	Red blood count	NC	NC	NC	NC	NC	NC	NC
6.	White blood count	NC	NC	NC	NC	NC	NC	NC
7.	Hæmoglobin in %	80	90	70	65	70	85	90
8.	Sputum and urine	NC	NC	NC	NC	NC	NC	NC
9.	1st course of Chloromycetin during admission.	24	24	24	24	24	24	24
10.	Time in hours when temperature dropped.	26	28	20	28	24	28	26
11.	Secondary rise of temperature, in hours, after the cessation of chloromycetin.	44	40	36	24	38	26	24
12.	Result of Widal's test (Blood taken after the cessation of Chloromycetin).	Nil	Nil	Nil	Nil	Nil	Nil	Nil
13.	Total number of kapseals given in all	48	48	48	48	48	48	48
14.	Complications, if any, during the treatment.	Nil	Nil	Nil	Nil	Nil	Nil	Nil
15.	Result	C	C	C	C	C	C	C

D—Diarrhoea Pe—Pneumococcal pneumonia. NC—Nothing contributory. C—Cured.

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Trachonychia

Clinical and histological description of 3 cases in which nail changes not hitherto described in literature, were reported by Poznan Alkeiwicz. The clinical characteristics are nails rough, opaque, covered with scales and lunules not visible; periungual tissues not inflamed. Some nails show koilonychia. Lesions produced by inflammatory process in proximal part of the matrix which produces the superficial layers of the nail. Potassium hydrate, and petrol were found to be causative agents respectively in 2 cases; any irritant capable of producing inflammation might cause this disorder. (*Ann. de Derm et de Syphil*, 10, 136, 1950.)

A CASE OF DERMAL LEISHMANOID

T. V. VENKATESAN, M.B., B.S., F.D.S.,
Honorary Physician, Erskine Hospital, Madurai.

AND

R. VIJAYARAGHAVAN, M.B., B.S.,
Assistant Surgeon.

THE term dermal leishmanoid is given by Dr. Brahmachari to cutaneous form of leishmaniasis occurring after kala azar. Hence it is also called post-kala azar leishmaniasis. This distinguished the same from dermal leishmaniasis (i.e. oriental sore).

Cases of this type are rampant in India and requires early attention of the profession as is shown by the following report :

"The Director of the School of Tropical Medicine, Calcutta, has been kind enough to give the statistics of the cases of dermal leishmanoid during the past 5 years which shows that there are many cases which probably are missed. The statistics of the School of Tropical Medicine, is as follows :—

The number of new cases of Dermal Leishmanoid seen in the Hospital of the School of Tropical Medicine, Calcutta.

1946—61 ; 1947—80 ; 1948—128 ; 1949—157 ; 1950—222. Total 648 cases."

The following is the case history of the patient admitted in our ward :

1. A patient, by name S., was admitted on 17.5.51 with macular and papular rashes. On examination, it is found that he has depigmented patches on the trunk, (in front and back of chest) and on the face. Papular lesions are also found on the ears and chin. There is no loss of sensation in these patches.



Previous history :—The patient was in the same ward under Dr. T. V. V. for two months from December 12, 1946. At that time he gave a history of irregular fever of two months' duration. An examination of the system revealed the following :—

* Patient a well nourished individual, not anæmic, no history of rigor ; not jaundiced ; temperature intermittent ; respiratory and cardio-vascular system ; normal

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PALUDRINE POISONING—A. T. ROY

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abdomen, spleen—palpable, three fingers below costal margin : liver not palpable ; other systems : nil abnormal.

Investigations done :—1. Slide for M.P. :—No M.P.—Leucopenia.

2. Gell and Chopra test :—Positive strong.

3. Sternal puncture :—Not done.

Patient was given a course of Urea-Stibamine injections (20 injections), starting with 0.05 gms. and increasing by 0.05 till the maximum of point 0.02 gms. is reached. A total of 2.5 gms. was given.

Patient remained apyrexial for 10 days and discharged on 10th February, 1947, and asked to report periodically.

In the year 1948 he noticed the depigmented patches appearing on front of the chest, shoulder and later on the face. Some time later he noticed papular lesions appearing on the ears and face. At the Dindigul Hospital, he received a course of Hydnocarpus oil (20 injections I. M.) and again at Paramakudi another 20 injections were given. In the years 1948 to 1950 he used to get injections of Hydnocarpus oil and Sulphone tablets by mouth. On 14th May, 1951, he went to Lady Willingdon Leprosy Sanatorium, Tirumani. A skin clip was taken from three patches and it was negative for Hansen's bacillus. He was referred to the Erskine Hospital, Madurai, as an old case.

After admitting the patient he was examined. He was a well built individual with papular lesions on the ears and chin and macular depigment patches over the front of chest and face. Patient was a apyrexial and no enlargement of liver and spleen.

The following investigations were done :—

1. A skin clip was taken from papular lesions and showed L. D. bodies in the smear.

The diagnosis of dermal leishmanoid was confirmed. The case has been reported as this disease is not a common condition.

We thank the Superintendent, Erskine Hospital, Madurai for permission to report this case.

PALUDRINE POISONING

A. T. ROY,

Medical Officer, Purulia Leper Home and Hospital,
Purulia, B.N.R., Bihar.

A MAN, aged 30, had been suffering from malaria fever. He was not attended by any doctor. He sought advice from a neighbour who told him to take 3 tabloids of Paludrine in one day. The patient thought it convenient to take all the 3 tabloids at a time. Within 1 hour of taking the tabloids he became restless and felt acute pain in the gastric region. He started vomiting soon after and I was called in to attend on him. On examination I found him cold and well perspired and the pulse was very thready, in fact he was in almost collapsed stage. He was brought back to comfortable state after administering Coramine, Saline, etc., after 3 hours.

Now, this kind of report has been published in *I.M.G.* (Chakravarty¹, Sen², Gupta³). With the note of Dr. Mungavin⁴ of I.C.I. and the appreciation of the Editor of *I.M.G.*⁵ of the introduction a tablet having a double bisecting line, I feel myself bound to put forward our difficulties.

It is a known fact that most of the Indians are either treated by quacks or by the suggestion of neighbours and friends who seldom know or care to know the quantity of medicine in a tab., and the untoward symptoms which may crop in. It cannot be said that they, the sufferer, does not get relief in many instances by following such treatment and advice. While it is also difficult with the present

situation of India to stop people following the advice of the lay people, I think the manufacturers may well be asked to manufacture these tabloids in quantities of medicine which will be less likely to produce the unhappy symptoms. The highest authorities and the doctors, specially the eminent ones of the big cities, can hardly foresee the way the people take their treatment in mofussil towns and in villages. The experts and well informed doctors can advise their patients to take 2, 3 or more tabloids as they think best. They can control the dose in much easier way by adding the number of tabloids than the much nonconversant medical practitioners can do by cutting the tabloids in halves and fourths. So re-introducing the Paludrine tab. in 1 grm. will be much appreciated by the majority of practitioners.

References :

1. Chakravarty, A.K.—I.M.G., 1948, page 397.
- 2, 4, 5. Sen, P.C.—I.M.G., 1950, page 305.
3. Gupta, S.N.—I.M.G., 1950, page 433.

SYMPATHETIC OPHTHALMIA

(A Case Report)

MD. HABIBULLAH, M.B., B.S.,

Assistant Surgeon, Minto Ophthalmic Hospital, Bangalore.

VERY often the disease escapes notice and an early diagnosis is not done, more due to its supposed rarity than otherwise till such a time when the damage done to the only eye is colossal and irreparable. It is on account of this fact that I am reporting the following case which came under my care and treatment along with my observations for the benefit of the profession.

Case report.—J., a Hindu, female, aged 20 years, unmarried, with a complaint of slight blurring of the sight in the right eye for the last eight days, was brought to me on the morning of 17-2-'51 for an examination of her eyes.

On external examination, I found the following :

Right eye—Appeared perfectly normal ; Vision—6/12 partial. Tension—20 mm. of Hg.

Left eye—Eye ball larger in size than the right. Dense total leucoma. Movements of the eye ball normal. No perception of light. Tension—28 mm. of Hg.

Homotropine was instilled into the right eye and a dark room examination was done after two hours with the following result :

1. Pupil dilated uniformly with no irregularity in its margin.
2. Retinoscopy :—Normal red reflex and no refractive error.
3. Examination with the large ophthalmoscopic mirror at a distance of 22 cm.—(a) A few black specks like opacities in the pupillary area.
- (b) A few larger grayish opacities $\frac{1}{2}$ to 1 mm. in diameter, sharply defined and spread irregularly over the lower half of the cornea.
4. Indirect and direct ophthalmoscopy :—Fundus showed no abnormality.
5. Slit lamp examination :—Showed a few definite rounded translucent opacities situated on the post surface of the lower half of the cornea.

A provisional diagnosis of cyclitis with K. P. was made and detailed previous history was taken.

PREVIOUS HISTORY, (Given out by the father and the patient).—

It appears that seventeen years ago, when she was about three years old and while going to school with her sister carrying an umbrella, she got a hit with its lower end which pierced her left eye. She was treated for the same for nearly a month and ever since that time she has lost her left eye. This incidence happened when she was at Tongu (Burma) with her parents.

A few months ago she had some pain, redness and slight watering in the blind eye after continuous reading for two to three hours. It lasted for three to four days and then subsided after some treatment at the local hospital. One month ago tattooing was attempted on the left eye without much success when again she had a similar attack of pain, watering and redness, accompanied by severe head-ache on the left side. Eight days ago she noticed slight dimness and blurring of her sight in the right eye which has persisted since that time.

After eliciting the history, a diagnosis of sympathetic ophthalmia was made and the following examination and investigations were carried out :

1. Her general condition was good.
2. Periods were regular.
3. Blood was taken for Wassermann Reaction :—(—ve).
4. Blood for Hb—70% ; R.B.C.—4. mil. ; and W.B.C.—6,000 ; Different count : Polymorph—70 ; Lymphos—22% ; Eosino—5% ; Basophyls—2% ; and Monocytes—1%.
5. Urine for albumin—nil ; Sugar—nil ; Reaction—acid ; Microscopy—nil ; Sp. Gr.—1013 and Culture :—negative.
6. Motion examination :—No ova, no cysts, no pus cells and no R.B.C.
7. Teeth :—Normal and healthy.
8. Ear, nose and throat examination :—Normal.
9. Screening of chest :—Normal.

The diagnosis of sympathetic ophthalmia was confirmed, and she was advised for immediate removal of her blind eye (left eye) for which she and her parents consented. She was admitted to the hospital. The eye ball was excised on 18-2-'51 under local anaesthesia and the following local and general treatment was given :

1. Atropine drops and ointment 1% with fomentation twice a day.
2. She was put to bed with dark glasses to wear and light diet.
3. Saline purgative given every 15 days.
4. Penicillin 50,000 units twice a day given for one week.
5. A full course of Sulphonamides was given.
6. (a) Mist. Hydragryri et Iodide t.d. ; (b) R Calomel gr. $\frac{1}{4}$; Sodabicarb gr. v, t.d. ; (c) R Soda Sal gr. x ; Soda bicarb gr. x t.d.
7. Colloidal Iodine 0.4% 10 c.c. intravenous twice a week.
8. The eye was submitted to regular fortnightly D.R. examinations.

She showed definite improvement after one month when the vision was 6/9 partial with signs of resolution of K.P. After this the improvement was very slow. She was discharged from the hospital on 7-7-'51 with practically no signs of K.P. and the vision being—6/6. She was advised to come once every fortnight for a check-up.

Thus it is seen that there is no age limit for the development of sympathetic ophthalmia even though it is considered now-a-days to be very rare after two years of a perforated injury. It can occur after a lapse of many years as it has occurred in this case after a period of seventeen years. Hence, in all cases of perforated injury to one eye, this disease should always be borne in mind whenever the other eye shows any signs and symptoms of diminution of vision and early cyclitis without taking into consideration the time interval, until otherwise proved.

Lastly my thanks are due to Dr. S. Vasudeva Rao, Superintendent, and Dr. K. S. George, R.M.O. of the Minto Ophthalmic Hospital who helped me to treat and write this case report.

A CASE OF PAPILLOMA OF THE CONJUNCTIVA

K. S. DUNAKHE, L.M.P.,
Ophthalmic Surgeon, Jalgaon, E. Khandesh

AN old woman of 74 years from a village in East Khandesh was brought to me on 30th March '50 for a small growth in the left eye. The duration of the growth was said to be four months.

On examination it was found to be a small papilloma covering one third of the cornea, the sclerocorneal margin and about 3mm. of the bulbar conjunctiva. The growth had invaded the cornea and the sclera as it could not be moved over them. It was fixed. The vision of that eye was F.C. at 2 feet. The pupil reaction to light and accommodation was normal. Tension was also normal. There was no marked conjunctival congestion. The lens was cataractous. I suspected strongly about the malignant change in this growth and so I advised enucleation to which the patient submitted.

The enucleation was carried out on 2nd April '50 under local anaesthesia. The enucleated eye ball was sent to the Tata Memorial Hospital with a letter to Dr. Borgis requesting him to be kind enough to do the histological examination of the excised eye ball. The patient was discharged on 7th April 1950. The patient had no further trouble till the reporting of this case.

The following is the pathological report from the Tata Memorial Hospital:

Ref: A tissue from the eye ball received on 5th April 1950.

Gross examination:—Complete eye ball with papillary flat growth on cornea 6 mm. in diameter.

Microscopical examination:—The histological examination shows a small growth arising apparently from the epithelium of the conjunctiva. The growth is composed of processes of large squamous cells. Areas of dyskeratosis are present but squamous pearls are not seen. The cells show loss of polarity and anisocytosis. The nuclei are large, ovoid vesicular and hyper-chromatic. They show a fair number of mitotic figures the sub-epithelial connective tissue shows a chronic inflammatory exudate.

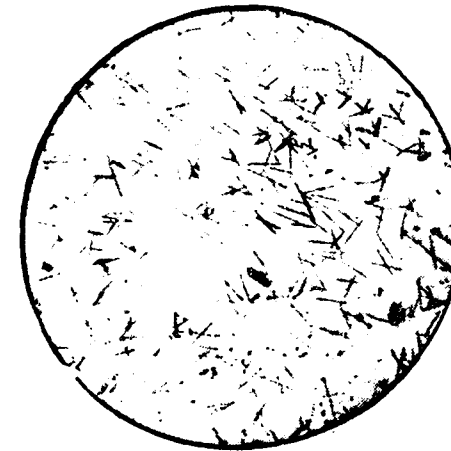
Diagnosis.—Squamous carcinoma Grade I.

This case was seen by other experienced ophthalmic surgeons who were of the opinion that the case was simply a papilloma and excision of the growth only was adequate. The question about the cancerous change in the hitherto benign growth cannot be settled without biopsy.

I am very grateful to Dr. Borgis and Dr. Khanolkar for carrying out the histological examination gratis, taking into consideration the financial position of the patient.



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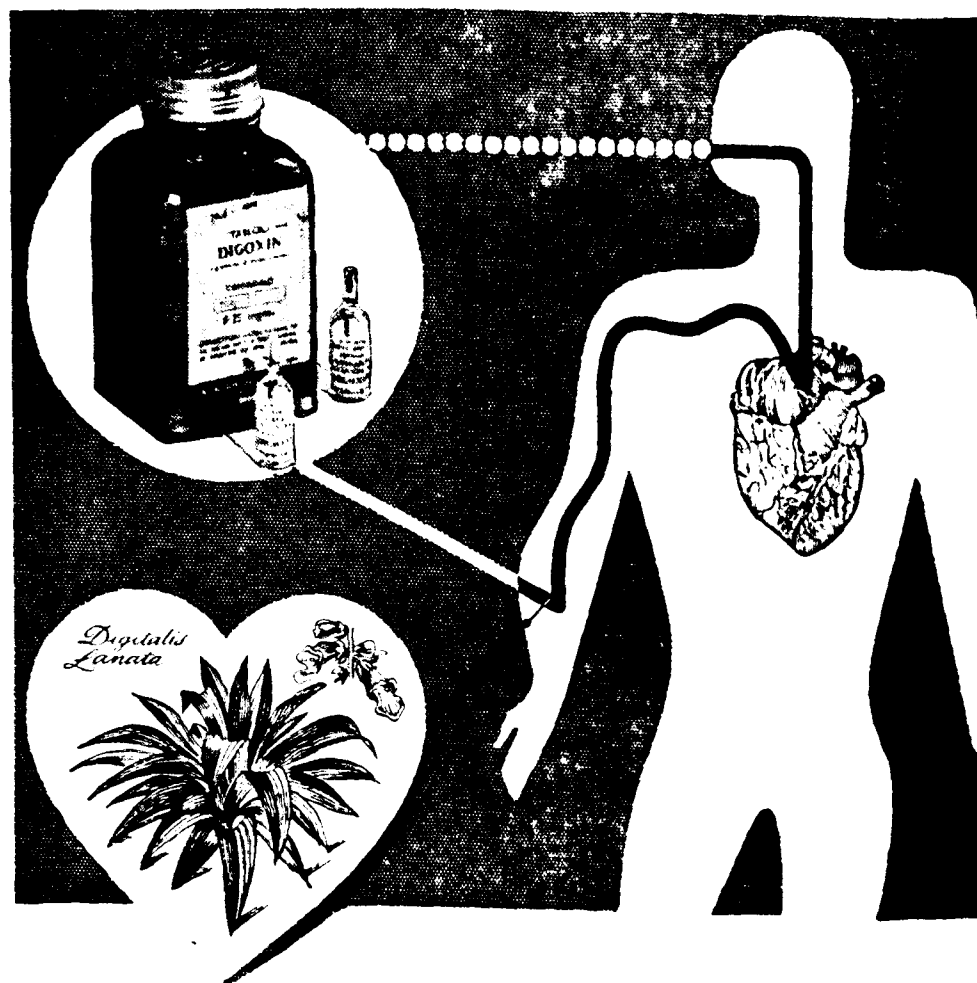
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No. 10

THE SOUTH INDIAN PROVINCIAL MEDICAL CONFERENCE

MALNUTRITION which has become chronic in this country, causing sickness and reducing the life span, is given the place of honour in the address delivered by Dr. U. KRISHNA RAU, who presided over the Sixth South Indian Medical Conference held at Kozhikode in the first week of this month. In every country where malnutrition and infectious diseases have been reasonably well controlled, the average length of life has increased to well over 55 years. It is also stated by those who are working in the field in the West, with some degree of confidence, that when the knowledge already made available by steady and continuous research is fully applied to the prevention of disease, an average duration of life of more than 60 years can easily be obtained. Now that the average length of life in India is less than half this figure, it naturally follows that the people are sacrificing more than half the period of their existence that has been made available to them by Nature. Though nutrition research is undertaken on a fairly good scale in this country, the facts gleaned therefrom have not been made available to the public to the extent that it should be. We do not blame the authorities for this unsatisfactory state of things. The ignorance of the people, a majority of whom are unlettered, is very largely responsible for this sorry state of things. Instead of considering this an easily preventable malady, the people take it to be a normal feature of their existence and plod on in a disease-ridden and miserable condition. The affection of this country by this grave malady is bound to have its repercussions in other fields of activity, that it is the duty of the Governments, both in the Centre and in the States, to bestow their

immediate and urgent attention to this problem so that the great and important plans of development drawn up by the Planning Commission can be implemented and our beloved Motherland placed on a par with other advanced countries in the West.

It is not necessary to deal with the whole range of subjects that have been referred to by the President in his address. It is sufficient for our purpose if we refer to the most important of these so as to draw the pointed attention of the authorities to them. It is admitted on all hands that the failure of the Governments to improve public health and extend medical relief far and wide is very largely due to the lack of personnel to man the existing institutions and to take charge of new ones. The Bhore Committee which examined this matter at great length made the unanimous recommendation that only by the establishment of more and more medical colleges all over the country can this lack of personnel be remedied. It is many years since their monumental report was published and it is only now that we have the comforting news that as part of the Five Year Plan recommended by the Planning Commission two more Medical Colleges, one at Madura and the other at Guntur, would be established in the near future. This is welcome as far as it goes, but it is not sufficient to meet the regional requirements of our State. Two more colleges, one in the West Coast and another in the Ceded Districts, are absolutely necessary to satisfy at least the minimum requirements of this State now. But considering the large outlay involved in the establishment of medical colleges it seems doubtful if the Government of Madras, in their present financial position, would be able to come forward in the near future to meet this urgent requirement. In the circumstances it has become necessary to think of other means whereby the output of medical colleges can be increased to meet the growing demand. As we have pointed out on many occasions previously, the output of the two existing colleges is just sufficient to cover the wastage caused by retirement from active practice or death. Even if two more colleges, as decided upon, are established, we can have only 200 more graduates a year, after the sixth year, assuming that all the students admitted come out successful in the final examination. But non-academical and other considerations are unfortunately allowed to play an upper hand in the selection of candidates for admission to medical colleges that there appears to be no prospect of that fond hope materialising. The only alternatives left are the introduction of the shift system and the admission of additional students to the medical colleges as recommended by the Executive Committee of the Indian Medical Council. That Committee was not unaware of the limited scope and functions of the Medical Council when it made this recommendation. It is only as an emergency measure, to meet the dire need for more qualified men, that they had gone, even out of the way to make such a recommendation. Dr. Sir A. LAKSHMANASWAMY MUDALIAR, the Vice-Chancellor of the Madras

University, questions the propriety of this recommendation and expresses the fear that it would lower the standards of medical education here. What then is to be done to meet the present grave emergency of lack of personnel? If he comes forward with any other constructive suggestion we are sure it will be given the consideration it deserves both by the Governments and the members of the profession.

With the present output of graduates hopelessly insufficient and the prospect of a larger output not likely to materialise within six years even if the two more colleges sanctioned are established, we have to expand medical relief to the extent possible with the personnel now available. While the medical profession is considered one of the noblest, the treatment meted out to them is far from satisfactory and a definite change in the outlook of those in authority is urgently called for. The President has pointed out some of the grievances under which they are labouring. The list is not exhaustive and many more can be added to it. But pointed attention has only been drawn to the most important of these. The differentiation in regard to essential service now in force between those in Government service and independent medical practitioners can easily be done away with and independent medical practitioners can easily be saved from vexatious eviction proceedings under the Rent Control Act, at least in regard to their places of business. The public will, we are sure, only welcome it. The restriction in regard to the stocking of tinctures and spiritous preparations which medical practitioners can hold is wholly uncalled for and unjustifiable. Practitioners who are allowed to prescribe these to their patients can certainly be trusted to hold sufficient stock of these for dispensing to their patients, and it is unbecoming to place them in the same category as other dealers and insisting upon their paying a fee and taking a licence. To place the Radiologists who keep the X-ray plant for the diagnosis of patients' ailments under the thumb of Commercial Tax Officers for the purpose of Sales Tax only reveals a lack of understanding on the part of the authorities of the functions of a Radiologist. Persons in authority in the Medical Department are, it is said, one with us in this view, and the Government would therefore be well advised to exempt them from the tentacles of the all-pervading Sales Tax Act. The ban on Government medical practitioners holding Secretaryship or Treasurership of any scientific society is wholly unwarranted, unjust, uncalled for and undemocratic. While they are allowed to be members of such organisations, it is undue interference with their freedom and the freedom of the members of the organisation to prohibit them from being elected to executive positions. Such a ban will also operate to the detriment of the interests of the organisation concerned and retard the development of these specialities. There is absolutely no justification for any fear, near or remote, that these organisations will

indulge in politics to the detriment of the interests of the State. They are specially established for the development of the particular branches of medical science and the ban should therefore go. While the abolition of the cadres among Assistant Surgeons is certainly a step in the right direction, the order issued in connection therewith is bound to create some anomalies which it is the duty of the Government to take note of and remedy without delay. The position of Medical Officers in the service of local bodies is really hard. They are as well qualified as those in Government service and they do the same duties as government servants. Only they labour under greater difficulties than those of government servants. They are subject to the pinpricks natural while working under elected bodies. It is therefore necessary and urgent that they should be placed on a par with those in Government service. It is not possible to exhaust the list. Suffice it to say that these and other grievances should be remedied without delay if medical practitioners are to come to their own and play their part in the reconstruction of our country.

It is but fitting that the President should have closed his address with an appeal for unity among the ranks. Great and serious problems await early solution and the medical practitioners have to play a large and important part in the solution of these problems. Their voices can be heard, their suggestions well received, their opinions respected and acted upon only if they can speak with one voice from Cape Comorin to the Himalayas. The Indian Medical Association has fully justified its existence and played an important part in the amelioration of the condition of medical practitioners, in the advancement of medical science, and in the spread of knowledge on the latest developments in medical science through its mouthpiece, the Association journal. It has to play a still greater part in the future. But when an organisation grows it is likely that dissatisfaction crops up here and there, that fissiparous tendencies rear their ugly head, that the spirit of independence of the times comes to the forefront. But no one should lose sight of the basic fact that only in unity lies the strength of the profession, its power to do good to itself and to the society. We therefore appeal to those inside the organisation to give it all the strength and resources it needs, and to those who are still outside it for reasons of their own to join it forthwith and make it the sole accredited organisation of the practitioners of the Allopathic system of medicine.

REACTIONARY AND RETROGRADE

THE Medical Registration Act of 1914 is nearly four decades old that it is quite possible that some lacunæ should be found in its actual working, demanding its amendment. But any amendment brought forward must be a step towards progress and not one which will put the clock back. We very much regret to have to say that the Medical Registration (Amendment) Bill brought forward by the ex-Minister for Public Health and Medical Relief should be of such a retrograde and reactionary character as to draw forth the strongest opposition from veterans in the profession, Dr. Sir A. LAKSHMANASWAMY MUDALIAR, Dr. P. CHERIAN, Dr. P. S. SRINIVASAN and many others, not to speak of the unanimous opposition voiced forth by the profession as a whole through their organisation, the Indian Medical Association.

Dr. T. S. S. RAJAN attempted to seek support to his Bill by citing the difficulties that cropped up as a result of the election to the Medical Council held in the year 1946. And he sought to bolster up his case by drawing the attention of the members of the legislature to the judgment of the High Court of Madras where it was taken up as the aftermath of the election. Dr. P. S. SRINIVASAN who had been a member of the Medical Council for the last ten years pointed out that the Council had at no time acted against the provisions of the law and if it had to flout the instructions of the Government it was because the Council felt that the instructions issued by the Government were illegal and therefore the Council felt that it was not bound in law to implement them.

It is unnecessary for our purpose to rake up the old history of this struggle between the Medical Council and the Government. It is sufficient for our purpose if we examine whether the provisions contained in the Bill are in consonance with the spirit of the times and are enlarging the rights of the people or are curtailing it. Even a superficial examination of the Bill is sufficient to convince every reasonable man that it puts the clock back and is therefore a step in the wrong direction.

When the Act was passed in 1914 by an alien bureaucracy enthroned in power to this Province, their usual method of providing a nominated President so as to keep the body under their control was adopted. It was after a hard fight that a successor government was made to see the error of the previous regime and confer upon the Council the privilege of electing its President. And under a non-official President, elected by the members, the Council had carried out its functions without any hitch, to the entire satisfaction of all till the fateful year 1946. Even assuming for argument's sake that the case put forward by the ex-Health Minister is correct—we do not grant it—we ask whether it is sufficient justification to deprive that great body composed of the intelligentsia of the

Province of its right to elect its own President and thrust upon it an officer of Government who, however well intentioned, cannot command the same respect and confidence as a non-official can. The very fact that an official is placed at the head of affairs is sufficient to lower its prestige in the estimation of the profession as an official body, intended to bow down to the wishes of the Government and having no independence whatsoever.

It was announced some days back in the Press that in view of the very strong opposition voiced forth by the members of the medical profession in the legislature to the provision for the nomination of the President, the Government proposed to withdraw that provision from the Bill. If the Government had really decided so, they would not only be congratulated for the respect they have shown to public opinion but would also have saved themselves from the charge that though they professed to be votaries of democracy they had enacted a highly undemocratic law. But the Chief Minister, who is in-charge of the Department owing to the resignation of the Health Minister, is reported to have stated that so far as he was aware the Government had no such intention at present. May be the Government can, with the large majority they have in the present legislature, place the legislation on the Statute book. But they would get the opprobrium of the profession and of the public for professing one thing and practising another.

Even in regard to the selection of a panel of three names from among whom the Government intend to nominate one as Registrar, the justification pleaded by the ex-Health Minister is far from satisfactory. The only argument he put forward was the block canvassing which would make the position of the Registrar impossible. And this argument he developed from the objectionable practice adopted by a set of candidates at the last election. We quite grant that such an action is highly objectionable. But the objection will hold in regard to many other elections as well. Can it be said that such a practice is not indulged in in regard to other elections and if the position of many officers of Government are not made impossible thereby? If the practice indulged in during a previous election is objectionable—and we reiterate our view that it is objectionable—the remedy for it lies not in the proposal put forward by the Government but in preventing such things from taking place. And that can easily be done by adding a new Rule making it objectionable to canvass in that way.

Ours is a democracy. It has been attained after a hard struggle lasting for years with a powerful alien bureaucracy. It is the duty of those who are now placed in power to extend its scope so as to cover every field of activity. In the circumstances, the present attempt of the Government to stifle democracy is a most reactionary and retrograde step which will not be condoned. It is not yet too late for the Government to retrace the step. Such retracing is only a measure of

strength and not of weakness. A false sense of prestige should not blind the eyes of Government and make them persist in the wrong course they have chosen. Let them withdraw the Bill altogether. Nothing will be lost thereby. The ex-Health Minister has stated that the working of the Act has shown that there are many lacunæ in it. If so, let the Government bring a comprehensive Bill. Only the amendments they propose should be progressive in character and not retrograde or reactionary. And any comprehensive Bill containing provisions which can stand that test will surely be welcomed by the legislature and placed on the Statute book. We appeal once again to the Government to withdraw this obnoxious Bill from the legislature forthwith. We hope that the new Health Minister Mr. KALA VENKAT RAO will respect public opinion and withdraw the Bill.

Chloromycetin in Whooping Cough

Khalil and Abdin, Pædiatricians of the Cairo Faculty of Medicine, treated 25 cases of whooping cough with chloramphenicol (50 mg. per kg. of body weight, initially divided into 4 portions given over 45 minutes followed by 50 mg. per kg. of body weight in the next 24 hours divided into six-hourly doses. This is continued for a week; and thereafter half this dosage was continued for a further 7 to 10 days). The drug was given in a gum-emulsion syrup on empty stomach: 9 of the 25 cases were in the catarrhal stage, 11 were just at the start of the paroxysmal stage (2-5 days), and 5 were in the later established paroxysmal stage (5-10 days). Of the 9 patients in the catarrhal stage, 2 ceased altogether to cough in 4 days and another 3 continued to have an insignificant cold like cough for 1-2 weeks. 3 developed, despite the drug, a quite typical but mild spasmodic cough which continued for 4 to 6 days after which they had a mild bronchitis-like cough for 1 to 2 weeks. The 9th case was least affected by the drug; she had a severe spasmodic cough for 18 days; this patient had severe diarrhoea for 8 days at the start of the treatment and this accounted for the apparent failure.

Of the 16 cases of early paroxysm, 15 were considerably relieved the 4th day, as judged by the improvement in the frequency duration and severity of the paroxysms. The whole stage lasted for only 9 to 16 days. The 16th patient showed on the 4th day a very remarkable improvement in the severity and frequency of the paroxysms and whooping ceased. She had however a somewhat severe spasmodic cough for about 3 weeks.

The milder course and the shorter duration—or the total absence in some cases—of the paroxysmal stage in 23 of the 25 cases cannot be ascribed to chance. Chloromycetin given early in these cases had transformed an intractable and protracted disease into a mild and almost insignificant illness.—(*Lancet*, 19-8-1950, p. 307).

THE SIXTH SOUTH INDIAN PROVINCIAL MEDICAL CONFERENCE

Presidential Address

The following is the full text of the Presidential Address delivered by Dr. U. Krishna Rao, M.B., B.S., Editor, THE ANTISEPTIC, Madras, in the Sixth South Indian Provincial Medical Conference held at Kozhikode on October 5, 1951:—

I CANNOT sufficiently thank you for the great honour you have conferred upon me by electing me unanimously to preside over this Conference for the second year successively. There are among our ranks many members who have greater claim for your consideration, members who have, by their meritorious services to the Association and to the cause of ailing humanity, become entitled to your suffrage. But yet if you have chosen to elect me unanimously for the second year in succession, I take it that it is due to your appreciation of the humble services that I had been able to render in the year that has just now come to a close and the confidence you have in me that, in the year to come, when momentous problems have to be solved if the country is to go ahead unhampered, I shall be able to continue to serve the cause of the profession without fear or favour, and that I shall discharge my duties and responsibilities to the satisfaction of you all. I must, however, tell you all that the burden you have chosen to throw on me is too onerous and heavy for a humble person like me to shoulder, and that, without your hearty co-operation as in the past, I shall not be able to discharge these responsibilities that have devolved on me satisfactorily. I therefore appeal to you, one and all, to extend to me your willing and hearty co-operation in the great and uphill task that lies ahead of us.

Our Loss

It is my duty at the outset to pay homage to the memory of the members of the profession in general, and to the members of our Association in particular, who have been snatched away from our midst by the cruel Hand of Death. Many of them had been active members of the profession, and had taken a very large and leading part in upholding and enhancing the reputation and honour of our profession; many of them, members of our Association, had devoted their time and energy to strengthen the Association and to enhance its prestige. We miss greatly the bright and beaming faces which gave us a gleam of hope, friends who guided us in our activities by their sage counsel and valuable advice, when we were groping in the dark, when we were faced with many difficult problems. The country in general, and the profession in particular, are the poorer by the passing away of such great and good souls, and I am sure this Conference will register its deep sense of regret at their loss and convey to the members of the bereaved families its sincere condolences.

Hopes and Fears

The advent of the new era of Independence raised great hopes in the minds of the people that the sufferings they had undergone for long silently, would come to an end, that an era of health and prosperity would dawn upon our beloved Motherland, that the many problems that had been left uncared for, for long, would be taken up immediately on hand and effective steps taken to bring about a change. But in spite of the fact that our leaders were aware of the great leeway that had to be made if our country is to be placed on a par with other advanced countries in the West, the course of events that took place as an aftermath of partition demanded all their energy and the resources of Government that things had to be allowed to remain in much the same condition. I should not be understood as saying that nothing has been done since the advent of independence. But what has been done, what has been achieved, is but a trifle compared with what remains to be done. This has unfortunately created in the minds of the people a feeling of despair, a fear that political and economic conditions continuing to remain the same, if not going worse, anything substantial could not be achieved within a measurable length of time. Such a feeling of despair, such a feeling of frustration is the greatest enemy to the advance of mankind, and it is the elementary duty of the States, both Central and Provincial, to rise to the occasion and do everything in their power to allay the fears that have taken hold of the people and which are growing deep with every passing day.

Malnutrition and Disease

There is a general impression that the only major preventable diseases are those caused by infection; indeed, there are many countries in which a high standard of health has been attained by concentrating attention almost exclusively on the control of these diseases. This success has given rise to the assumption, ill-founded though it be, that similar results can always be achieved by the prevention of infection, and accordingly the efforts of public health organisations have almost everywhere been directed towards this end. But there are many countries in the world, and India is one of them, where another group of diseases are responsible for more sickness and premature death than all the infectious diseases taken together. This group consists of the types of malnutrition caused by insufficient and unsuitable food. Even a most casual observation of the people of India will show that most of the inhabitants suffer from life-long ill-health and poor physical development which are the results of faulty nourishment. And it is not difficult to establish with abundant evidence that most of the people who die in India of infectious diseases could have survived if their powers of resistance had not been sapped by malnutrition. So that, although the official returns show one or other infectious disease as the cause of death, from the practical point of view the real cause is, in a large majority of cases,

malnutrition. The means of preventing this malnutrition has never been a mystery so that, in the strictest sense of the word, it is certainly a preventable disease. In India where malnutrition is a major public health problem, no effective organisations have been set up to measure the harm that it does and to supply expert advice on the measures needed for its control. This does not mean that I am unmindful of the valuable research work that is being done in India on the subject of nutrition; it has only proved beyond any shadow of doubt that the diets of most of the people are quite inadequate to maintain health. The information so far made available by research ought by itself to have called attention to the need for a thorough investigation into the root causes of the inadequacy of the diets. It is worth mentioning here that in every country in which malnutrition and infectious diseases have been reasonably well controlled, the average length of life has increased to well over 55 years; indeed, it has been stated with some degree of confidence by experts that when the knowledge already available has been fully applied to the prevention of disease, an average duration of life of more than 60 years can easily be obtained. Seeing that the average length of life in India is less than half this figure, it is clear that the people are sacrificing more than half the period of existence that has been made available to them by Nature. This is not the whole story; the shortened span of life is spent in a disease-ridden and miserable condition. No further evidence is needed to show that the country is already in a state of grave emergency, and the only reason why this has not aroused a sense of alarm and horror is that it has existed for long and so has come to be regarded as the normal condition in India. The remedy, of course, is obvious. It is, so to say, a straightforward matter; perhaps the apparent simplicity of the problem has been the reason why the help of public health experts has not been considered necessary, except in connection with dietetic research. It has always been assumed that the only thing needed is to produce more food. By such means as the construction of great irrigation works and the introduction of improved methods of agriculture, extra food can be provided to feed the millions of people. Of late, considerable attention is devoted to the extension of irrigation facilities and the improvement of methods of agriculture. But the former will take a long time to fructify; and while improvement in the methods of agriculture with a view to increase production is slowly taking root, it will equally take a very long time for such methods to become common. The food situation is already distressing; the press statements issued by those in authority, both in the Centre and in the States, is causing serious alarm in the minds of the people. It has therefore become a major public health problem, and that is the reason why I have assigned the place of honour to it. It is the medical profession that can consider the problem in all its bearings and suggest suitable and effective measures to combat it.

Rural Medical Relief

India, as everyone knows, is a land of villages. A very large majority of the people live in rural areas, and many of the villages are lying far away, remote from civilisation. Though they constitute the backbone of the nation, though they have, by the sweat of their brow, to produce food grains, to feed the population of the country as a whole, they are left neglected, uncared for, in spite of official pronouncements that it is the main duty of the State to provide them with their needs. So far as public health and medical relief are concerned, the condition of these people is, to say the least, pitiable. They live in very insanitary surroundings, falling an easy prey to the many viruses that grow and thrive in this congenial soil. And when they fall sick of some disease or other, there are no medical facilities at hand to restore them to health. To combat this, a scheme of subsidised rural medical relief was introduced in this State in the twenties and it was gradually extended also. But owing to the very low scale of subsidy given to the rural medical practitioners and the humiliating conditions under which they have been forced to work, the scheme has failed to attract practitioners, with the result that many institutions established under this scheme had to be closed down for want of personnel to man them, depriving the people of these localities even the meagre facilities they had so far had. True it is that the subsidy has been increased recently, but it is not commensurate with the needs of the times, and it compares also very unfavourably with the pay of many menials in urban areas. No wonder medical practitioners who have had their education at a considerably heavy cost and who have got themselves accustomed to the atmosphere and amenities of town life, feel themselves like fish out of water, however much they are actuated by the spirit of service. The net result has been a depletion even in the meagre number of institutions that had so far existed and a proportionate increase in the lack of facilities to the rural population. Dr. T. S. S. RAJAN, our ex-Health Minister, speaking recently at Madras, stated that the problem is a baffling one and any suggestion put forward for its solution will be favourably considered by the Government. Not that no suggestions have so far been made to tackle this problem of problems on which the future welfare of the country depends. Both the profession and the public have given considerable thought to it and put forward their views before the Government. I have myself, in the address delivered at the last Conference, suggested the desirability of seeking the co-operation of private medical practitioners in this great and noble task. The Governments of other States are also actively considering this matter and adopting plans to meet the requirements. One such plan decided upon by the Government of Bombay is to make it obligatory on those graduating from medical colleges to serve in rural areas at least for a limited period. This would not only enable them to get themselves acclimatized to rural surroundings,

but also help them to understand the people's needs and requirements. But our ex-Health Minister feels that such compulsion would amount to an interference with the freedom of the individual to practise his profession wherever he liked. In my opinion such compulsion cannot and will not amount to any interference with the freedom of the individual as Dr. RAJAN fears, and medical graduates themselves will not be opposed to it, provided their pay and conditions of service are made satisfactory. The problem of rural medical relief is such a huge one that, unless all possible measures are adopted, it cannot be tackled satisfactorily.

Medical Education

And this brings to the fore the question of the personnel. It was recently announced in the Press that there was one medical practitioner for every 700 of the population in the United States. Even this has not satisfied the leaders of that great country. They want more and more medical men and women to attend to the needs of the people, and an appeal has been issued by ex-President HOOVER and others for funds to relieve the medical schools from the critical financial position in which they find themselves. The response has been satisfactory and we can certainly expect that more than the target figure will be realised every year to aid these institutions. It is impossible for us, within a foreseeable length of time, to attain the present level of the United States in this matter. But even assuming that we are to provide one medical practitioner for at least 2,000 of the population, many more times the number of the existing practitioners will be required. The number of graduates who come out from our two medical colleges every year is only just a little over the wastage caused by retirement from active practice or death. We have had the cheering news only the other day that two more medical colleges, one in Madura and the other in Guntur, will become an accomplished fact in the near future. From the announcement made in this connection, it is clear that each college will admit only 100 students a year. We cannot say how many will come out successful in the examination after undergoing the long and arduous course of training. Even assuming that all the students come out successful in the end, we can have only 200 more medical graduates every year after the sixth year. Will that be sufficient to meet the needs of the situation? Certainly not. It is because of this difficulty that the introduction of the shift system has been suggested by many members of the profession and by the Executive Committee of the Indian Medical Council. Our learned Vice-Chancellor, Dr. A. LAKSHMANASWAMY MUDALIAR, questions the wisdom of this course. He even appears to be shocked that such a suggestion and also the proposal that an additional number of students, not exceeding 25% over and above the number approved by the Medical Council, should be admitted in each medical college for five years, should have emanated from that body. He considers that such

a recommendation is outside the scope and functions of the Indian Medical Council, on the ground that the fundamental function of the Medical Council is to establish minimum standards of qualifications in medicine and to see, by a process of inspection and report, that these standards are being maintained. We have seen from the announcement in regard to the establishment of two more medical colleges what a huge sum is required to start a new medical college. And in the present financial position of the Government it is clear that it will not be possible for them in the near future to establish more, though at least one for the West Coast and another for the Ceded Districts are absolutely necessary. In the circumstances some other method has to be thought of which, while not in any way lowering the standards, will, at the same time, help to increase the number of medical graduates, to meet the needs of the situation. Neither the introduction of the shift system, nor the admission of more students into the medical colleges than has already been allowed by the Indian Medical Council, need necessarily lower the standard of education. What does lower the standard is the method of selection of students for the medical colleges. The opinion expressed by a distinguished American educationist is apposite and I take the liberty of quoting it *in extenso* for the information of one and all:

"When we come to the selection of medical students from among the thousands who apply for admission we reach a subject upon which there is a good deal of divided opinion, especially within the profession. For example, a few weeks ago a doctor whom we all recognise as having a good deal of insight told us that 'we exclude the good ones' in order to take what we take. From time to time this may well be so...The medical schools, however, are making investments on these students. If in the end they cannot pass their State and National Board examinations, all the personality and fine character that would make them good doctors are lost to the profession. Such a loss is great not only for the student who has been unfortunately selected, but also to the schools and to society. It may sometimes be true that the schools look too critically at the scholastic grades that candidates have achieved, but it is also true that those who do the selecting are fully as interested in the personal characteristics of the candidates. The selective process is not cut and dried, is not scientific, and cannot be made to operate on any precise criteria, but of one thing we may be sure; the selection, good or bad, predetermines the quality of the output to a greater degree than anything else in the vast system of medical education to which the candidate selected is subsequently exposed."

Neither a too critical examination of the scholastic grades nor the personal characteristics of the students weigh with those engaged in the selection of candidates to our medical colleges. What was

termed as the Communal G. O. governed their selection till recently. And with the declaration of that G.O. as *ultra vires* of the Constitution by the Supreme Court, a new plan has been evolved which, though not blatantly communalistic, at the same time introduces new, novel and unheard of methods of selection which are bound to seriously affect the standard of our future medical graduates. It is a pity that the Syndicate of the Madras University should have considered the present rationing system a right step toward the equalisation of educational opportunities. There are ways other than rationing which can be adopted for the achievement of the object in view, and the establishment of more and more medical colleges is one of them. But to adopt the rationing system which results in the non-selection of many deserving candidates who would, if selected, in course of time, be ornaments to the profession, is a most retrograde and reactionary procedure which will not only considerably lower the standard but also take away from the favoured young men the incentive to raise themselves to the level of others. This would in the long run do them more harm than good. While the Government stick fast to non-academic principles in the matter of selection of candidates, it is regrettable that they should have turned down the modest request of the Madras Branch of the Indian Medical Association to reserve some seats for the sons and daughters of medical practitioners. They have the tradition inborn in them and they will have also a decent clientele and a well-equipped dispensary to start with. To deny them the opportunity to stay on would result in driving them out of the field to which they have become accustomed and to which they have the aptitude, and this is a serious loss to the society.

I have also one or two practical suggestions to make in regard to the establishment of more and more medical colleges. If after 150 years of medical education at considerable cost of brick and mortar India can produce only 3 or 4 persons of international repute, it is time that we turn to the old ways of education in congenial surroundings at very little cost of brick and mortar. What is wanted is proper teaching and clinical instruction, and these can surely be imparted without a huge outlay on buildings as at present. Also the time has come for public benefactions for medical education. If philanthropists are approached in the right way, I am sure many would willingly come forward to endow large funds for the spread of medical education. Only the University authorities should not insist on a huge outlay in costly buildings as it is reported they have insisted upon in connection with the college proposed to be started in Udipi.

Grievances of the Profession

It is customary on an occasion like this to traverse from China to Peru, covering everything that comes in the way. In the address I delivered last year I dealt with many of the problems facing

the country. It is unnecessary to cover the same ground, the position remaining much the same today as it was then. I then purposely refrained from referring to the many difficulties the medical profession labours under, with a view not to allow an impression to gain ground that the profession is interested more in itself than in the larger and abiding interests of the country as a whole. But their troubles and difficulties have increased manifold, many unnecessary and uncalled for discriminations are made among the members of the profession, the treatment meted out to them is not worthy of their importance and usefulness, that I feel it my bounden duty to refer to them at some length with a view to get them remedied so that they can take more and more interest in the great tasks that lie ahead of them than it had been possible for them in the past.

You are all aware that though the independent medical practitioners are rendering an essential service they have not been included in the essential services so as to exempt them from some of the restrictions which greatly impede them in their work. If all the doctors are placed in one category and labour under the same difficulties, it is a matter on which we can raise our united voice. But discrimination has been made between those in government service and the private medical practitioners, that the latter are put to considerable avoidable hardships. I can quote the Madras Rent Control Act as an instance in point. While doctors in government service are exempted from the operation of the eviction clause of the Rent Control Act, private medical practitioners are liable to be evicted if the landlord so wills it. Private medical practitioners generally build up their practice in the localities they live in, and their places of business become the Meccas which their clients can approach at any time in the day or night for consultation and advice. If under the Rent Control Act they are evicted from their places and are driven to the necessity of moving to places beyond the reach of their regular clients, they not only lose their practice and have to start afresh, but also their clients who have confidence in them have to seek the aid of others who have no knowledge at all of their past bodily history. These inconveniences both, and if it is too much to exempt their dwelling places from the operation of the Act, at least their places of business may be exempted in the larger interests of the people. The Government would do well therefore to reconsider their previous order dated 7-7-1951 on the subject and exempt their places of business at least from the operation of the eviction clause of the Rent Control Act rather than leave them in the lurch and ask them to approach the Government as and when they require protection.

Medical and public health problems are assuming more and more importance of late and they are bound to assume still greater importance in the future. It is therefore necessary that the

Government should have the help and advice of the members of the Indian Medical Association, the accredited organisation of the practitioners of the Allopathic system of medicine, to tackle these problems. It was therefore a reasonable request that the Madras Branch of the Association made to the Government of Madras that their representatives should be associated with bodies or committees that might be set up to review medical and public health problems. The acceptance of this modest request is a very simple matter, and it would have created confidence in the minds of the medical practitioners that the Government are anxious to avail themselves of their counsel and advice. Though the Government have not turned down this suggestion, their Order dated 6th September '51 amounts to it in effect. Will the Government lose anything by acceding to this reasonable request and associating members of the Indian Medical Association in reviewing problems in which they are as much interested as the Government themselves? The Government should have jumped at their willingness to co-operate and taken full advantage of it. It is not yet too late and I trust the hand of co-operation extended to them will be utilised to the fullest possible extent.

The restriction to 2 oz. of any B.P. tinctures or spiritous preparations that can be kept by the members of the profession has, thanks to the persuasive skill of the deputation that waited on the then Hon'ble Minister for Prohibition, been extended to 2 lbs. But it has been left hanging for long and a sting has also been attached to it, viz., that they should take a licence like ordinary dealers, on paying a fee of Rs. 15, to hold the stock. While the members are considered competent to prescribe these tinctures to their patients, it is derogatory to their self-respect to impose any restrictions on the maximum they can hold and ask them to take a licence on the payment of the fixed fee. The restriction on the stock that can be held and the levy of a licence fee are quite uncalled for and unjustifiable and I trust the Government will remove them by suitably amending the existing Rules in consultation with the Indian Medical Association.

Industrial medicine is assuming considerable importance, and with the growth and development of industries as laid down by the Planning Commission, it is bound to assume still greater importance. And with the conflicts that have already reared their ugly head as a result of the *isms* to which each party attaches importance, they are bound to grow with the growth and development of industries. The medical officers attached to industrial concerns are, when they exercise their independent judgement as they are bound to do, sure to come into conflict with one party or the other, viz., capitalist or labour. It is therefore necessary and essential, with a view to avoid needless clashes, that these officers should be in full charge of all matters connected with the health of the workers, and certificates

granted by them should be made binding on both parties. In case of dispute the matter should be referred to a Tribunal consisting of a senior Government Medical Officer (a senior physician of any of the Government Hospitals in the city of Madras or the District Medical Officer in the mofussil), a representative of the branch of the I. M. A. having jurisdiction in that particular area, and a medical man nominated by the concerned Labour Union, and its decision should be made binding on both parties. Such a satisfactory arrangement will create peace in industry.

The Government of Madras have passed orders prohibiting medical men and women in government service from being Secretaries or Treasurers of scientific bodies. The reason for this restriction is not understandable. If it is because the Indian Medical Association will indulge in politics that this restriction has been thought necessary, it is at least understandable though not justifiable. But to prohibit government servants as a class from holding either the Secretaryship or Treasurership of a scientific body is of a very tall order, unjust in the extreme. There are among the members of the profession in government service many who are members of scientific organisations, such as the Association of Physicians, Association of Surgeons, the Radiologists' Association, and many others which have absolutely nothing to do with politics even remotely, and to deprive the respective associations of their help and guidance is not only uncalled for and unjust but is also a serious detriment to the growth and advancement of the sciences. It is time the Government of Madras climb down and remove the restriction altogether.

The Sales Tax which was first initiated in this Province during the first Congress Ministry has spread its tentacles far and wide and caused considerable hardship to the people in these difficult days that the Government of India have been forced to bring forward an all-India legislation to bring about relief to the whole country. No article is free from this tax and even X-ray photos have now come to be included in the category of articles liable to the levy. Diagnostic X-rays are not, as everyone knows, a commercial commodity. There is no buying and selling as such. It is a laboratory procedure for the purpose of correct diagnosis of human ills so as to give them the proper treatment. The Medical Radiologist is a professional man who investigates with the X-ray apparatus the condition of the patient and makes reports on his diagnosis to the doctor who has referred the case to him. The Radiologist cannot therefore be asked to register as a "dealer" and submit his accounts for being assessed to sales tax. It is therefore necessary that the Government should issue orders to the Commercial Tax Department to keep their hands off the Radiologists.

While we should be thankful to Government for the abolition of different cadres of Assistant Surgeons in their Order dated 9th April

1951, the difference in the scales of pay are still maintained, medical graduates being allowed to start on Rs. 200 in the scale while others who were in Class II are to start in the scale of pay of Rs. 150-25-400, at the next stage above his pay in the old scale of pay subject to the exercise of option allowed under Fundamental Rule 23. This option has to be exercised on or before 31-3-1952, failing which their pay is to be fixed in the new scale of pay with effect from 1-4-1952. This would cause great hardship to non-graduates originally in Class II and requires to be reconsidered. While thus the difference in the cadres of Assistant Surgeons in Government service is sought to be abolished in name at least, the condition of those in the service of local bodies is, to say the least, pitiable. They start on Rs. 80 and the maximum they can reach is only Rs. 150 though they are bound as government servants by the Government Servants Conduct Rules. This is discriminatory and is bound to cause considerable heartburning resulting in indifference and apathy and should be remedied forthwith by placing them on a par with government servants as they perform the same duties as government servants.

Village Vaidya Scheme

It is admitted on all hands that something should be done and that too without delay to extend medical relief to rural areas. But any ill-conceived plan is bound to make the position worse. It will be within your recollection that in the year 1947 the Government of Madras decided that steps should be taken to accord recognition to the practitioners of the indigenous systems of medicine in the rural areas, to improve their status and to make their services useful to the rural population. Under that plan District Collectors were to select most suitable private practitioners in villages with a population of 1000 or more for the purpose of recognition as Village Vaidyas or Hakims. These were to be given training in the rudiments of public health and used as public health workers, to be of service to the public. The Indian Medical Association feels, and rightly too, that it is not wise to allow these incompletely trained Hakims and Vaidas to practise in competition with Allopathic practitioners. If, however, they are given proper training, there can be no objection to their being used as auxiliary health personnel only. Merely because medical personnel is lacking they should not let loose on the rural population for the practice of medicine people who are not fully qualified in either system of medicine.

Honorary System

The overhead charges of administration are increasing day by day and are bound to increase further in course of time. Of the amounts allotted to the Medical and Public Health Departments, a large portion is eaten away by overhead charges, leaving practically very little for equipment of hospitals and purchase of drugs. It

was because of this that the representatives of the people urged upon the Government to introduce the Honorary System, as is done in many advanced countries in the West, to reduce the administrative cost. If the scheme then introduced as a result of this pressure had been extended gradually as was then fondly hoped, a very large proportion of doctors now serving in the hospitals would by now be Honoraries, and thereby considerable money would have been saved. But it was not to be. It will not be an exaggeration to say that the scheme was kept practically in cold storage for some years. As a result of the advent of the Congress Ministry the scheme has been given a new life and an announcement has also been recently made that the scheme will be further extended. The scheme has already been given a fair trial for a long time and it has been found to work very satisfactorily. There is therefore no reason why it should not be extended still further. The extension of this system will not only reduce administrative expenditure but will also give the honoraries special scope for the development of the knowledge of their specialities as a result of personal experience of varied and variegating types of diseases which come up for treatment to the hospitals. I therefore earnestly appeal to the Government to extend the scheme fully.

Indigenous Systems of Medicine

I have given expression to my views on the indigenous systems of medicine on many an occasion. They have had a hoary past and even today there are many who have full confidence in these systems. If in spite of these the practitioners of the Allopathic system of medicine stand aghast at the proposed plan of synthesis formulated at the Delhi Conference of Health Ministers last year, it is not because of prejudice or jealousy against these systems of medicine but because of the incompatibility of the two systems which differ widely in their basic concepts and theories. What the Allopaths say and I again repeat it on their behalf is this: that they would be ill-serving the great cause they have at heart if they were a party to a so-called synthesis which would not lead anyone anywhere but would lead to utter confusion. Let the votaries of the indigenous systems of medicine, instead of denouncing those who are against a synthesis, take active and effective steps to develop their systems on their own lines, uncontaminated, and place them on a scientific basis. They will thereby be rendering the greatest service to their systems and also enable those who still have faith in them to have the best treatment possible. If, as is stated often by the protagonists of these systems, it is more or less a self-contained one, they can as well go ahead with their own plans of development and make the Allopathic practitioners come to them to obtain knowledge of these systems, if they want it. I hope and trust that this suggestion which I have previously on many occasions put forward and which I

reiterate again, will be taken in the spirit in which it is offered and that the protagonists of these systems will go ahead on their own lines.

The Planning Commission

The report of this Commission has been before you for a fairly long time that I hope you would have become familiar with its contents. While for the advancement of any nation, planning is necessary, I have at the same time to point out that the subjects of public health and medical relief have not received as much attention as they should have been, in spite of the fact that special committees were appointed for the purpose. As pointed out by ex-President HOOVER in his appeal to the American people for funds for medical education, "the efficiency of practically all our industry and commerce today is dependent upon the health of their employees and their staffs." Can our planners say that they have kept this basic fact in mind when they prepared their plans? The growth of any industry depends largely on the health of the workers. How can ill-nourished, famished and unhealthy people be able to carry out the plans formulated by the Commission if no steps are taken to assure them positive health? It is time that the attention of the Government is drawn to this vital defect in their plans so that necessary steps may be decided upon. As the Tamil proverb goes, only if there is a wall can we draw pictures on it. So also, only if we have able-bodied, healthy men and women, can the plans for the development of industries be implemented.

The Medical Registration Bill

I have reserved to the last the Madras Medical Registration (Amendment) Bill of 1951 now on the legislative anvil. The motion that the Bill be referred to a Joint Select Committee of both Houses has been accepted. It is an irony of fate that when democracy is in full swing in this country, a Bill of such a retrograde character should have been thought of and brought forward, and that too by a veteran in the profession. It was stated some days ago that strong opposition to the proposal contained in the Bill to take away the right so long enjoyed by the Medical Council to elect its own President, and to introduce nomination in its stead, by the Government have decided to drop the proposal. But the statement made by the Premier who is in charge of the Department that the Government have no such intention whatsoever to his knowledge, makes it obligatory on my part to expose the hollowness of the arguments put forward in support of this highly objectionable and retrograde step. The sponsor of the Bill referred to the history of a previous election to the Council and to the judgement of the High Court in support of his case. Let me assume for argument's sake that serious irregularities had taken place in that election; let me also grant that the objection raised by Dr. LAKSHMANASWAMY MUDALIAR

to the collective canvassing of some candidates for seats in the Medical Council is perfectly sound. But I ask whether the deprivation of the Council of its right to elect its own President, which was secured after years of hard struggle, is justifiable? Supposing an elected member of Parliament or a State Assembly commits a serious irregularity. Will it be sufficient justification to deprive his or her constituency of its right to elect its representative? These and other questions arise as a result of the ill-conceived proposal brought forward by the Government. Even in regard to the Registrar, the proposal for a panel can hardly stand scrutiny, despite the arguments put forward in support thereof by the ex-Health Minister. It is a matter for gratification that strong opposition has been voiced to these proposals not only by the members of the profession in the legislature but also by the profession as a whole unanimously. If the Government are wise they should take note of this strong opposition, and drop the Bill altogether. If they allow false sense of prestige to stand in the way of doing the right thing, they will be considered guilty of setting back the clock of progress.

Our Association

Our parent body is growing in strength day by day. The two Associations in Mysore have merged themselves into one body, thus enhancing the prestige and importance of the Association in that State and adding to the strength of the parent body. But, as is always the case, when an organisation grows in strength, fissiparous tendencies are likely to rear their ugly head for one reason or the other. The relationship of some branches to the parent body is not all that is desired. At present, out of the subscription realised by the branches from the members, Rs. 8 is sent to the parent body of which Rs. 3 is sent back to the branch organisation for its use. It is quite possible that when some branches are sufficiently well advanced and are anxious to march further ahead they should consider this levy of 8 Rs. as unjustifiable and imposing a hardship and big strain on the members. No wonder that some branches are threatening disaffiliation from the parent body. The more the unity among the ranks the greater is the strength of the organisation and its power to do good to the profession as a whole. The threatened disaffiliation will not only weaken the branches but also weaken the central organisation as well to that extent. Great problems are facing the country at the moment and the central organisation has to play a very great and important part in moulding the policies of the Central and State Governments to the best advantage of the country and of its people. What is wanted is unity, more unity and the strengthening of the parent body by bringing into its fold even those who have, for reasons of their own, been keeping out of it. While therefore a membership drive is needed at the present moment, such fissiparous tendencies are bound to cause serious harm. And the parent body also has not been an organisation in name only. It has to its

credit considerable achievements which, but for its ceaseless efforts, would not have been possible. And the journal conducted by the parent organisation is a very useful publication of which any organisation may well be proud. Those who are attending to the journal work are serving in an honorary capacity, unmindful of the time and labour involved in the task. It is therefore necessary that members of the Association, recognising its usefulness and its power to do good, should voluntarily come forward to make further contributions to the common cause so that the Association and its accredited organ may grow from strength to strength and achieve their aims. I shall only conclude by saying "UNITED WE STAND, DIVIDED WE FALL."

JAI HIND.

Gleanings From Medical Press

MEDICINE AND THERAPEUTICS

Vitamin B₁₂ activity of oral liver extract.—(Cronheim O. and Dannenburg, W., *Jour. Am. Pharm. Assoc.*, 39, p. 126, 1950).

The isolation of vitamin B₁₂ in crystalline form has made it possible to reinvestigate the mechanism of liver therapy of pernicious anaemia. In this connection recent studies have indicated that the B₁₂ may be identical with the extrinsic factor present in liver extract. However, in order to be effective orally it requires the presence of the intrinsic factor, normally present in gastric juice. Since oral liver extract is known to produce a haematologic response in pernicious anaemia without the addition of gastric juice the vitamin B₁₂ activity of the oral liver extract was determined by a careful study of 7 samples of liver extract, using a lactobacillus as test organism and a solution of crystalline vitamin B₁₂ as standard. Suitable controls were simultaneously run. The results indicate fairly wide variations in the vitamin B₁₂ activity of oral liver extract. This is not surprising if one realises that these preparations are not standardized individually. They are made according to an accepted and approved procedure but the starting material (fresh liver) varies from batch to batch. The daily dose of the liver

extracts tested is 45 c.c. and represents a vitamin B₁₂ activity equivalent to from about 30 to 140 γ per day. This is much more than the 5 γ doses of crystalline B₁₂ found to be effective by Berk. (*New Eng. J. Med.*, 239, 911, 1948) and Hall, (*Proc. Staff. Meet. Mayo. Clin.*, 24, 99, 1949), when given orally together with gastric juice to pernicious anaemia patients. A haematological response followed the daily oral administration of 60 γ crystalline vitamin B₁₂ to a patient with pernicious anaemia.

Term "Vitamin P" to be discontinued.—(*Science*, 112, p. 628, 24-11-'50).

The Joint Committee on biochemical nomenclature of the American Society of Biological Chemists and the American Institute of Nutrition adopted the recommendation of the Federation of American Societies for Experimental Biology to the following effect:—

"The term 'Vitamin P' was first applied to a substance present in lemon juice; it was stated to be effective in reducing the extent of hemorrhage and extending the duration of life in scorbutic subjects of experimentation and was also proposed for the treatment of vascular purpura. Subsequent studies have failed to substantiate these claims

and the identity of a substance of a vitamin nature has not been established. Continued application of the term 'Vitamin P' to one or another of a group of polyphenolic substance will only lead to confusion. It is, therefore, recommended that the term "Vitamin P" should no longer be employed."

Aureomycin and chloromycetin in whooping cough.—(*Lancet*, 16-12-'50, pp. 800-802).

A controlled trial of Aureomycin and Chloramphenicol in the out-patient treatment of children with whooping cough was conducted by Gray and Mc Gill of the Belgrave Hospital for Children in London. The mothers kept a written record of the number of paroxysms of all types that this children had in each 24 hours. No child was accepted for the trial unless 3 of 4 conditions were present viz., (1) an absolute lymphocytosis, (2) a normal E. S. R., (3) a paroxysm observed during a visit to the hospital, (4) isolation of haemophils pertussis from a post-nasal swab. On the day after the patients were first seen, they were all started on 4 hourly doses of Chocolate-milk sugar powder—almost indistinguishable from one of the forms of aureomycin used. Between 3rd and 5th days after diagnosis is fully established, the selected cases were changed to aureomycin or chloromycetin which was continued for 5 days after which they reverted to the placebo powder which was continued till discharge. Children with a history of over 20 days' illness were not given antibiotics treatment.

Aureomycin:—(1) Spersoid (aureomycin was dispensed evenly in a chocolate sugar powder) was used 1 table teaspoonful containing 50 mg. active aureomycin in 28 cases and the usual capsules each containing either 50 or 250 mg. Children up to 4 years were given Spersoid. Over that age capsules of 250 or 50 mg. were given depending on child's ability to swallow. The daily dose for 38 cases was 50 mg. per kg. of body weight divided into 4 hourly doses.

Chloromycetin:—(1) An emulsion in lemon syrup containing 250 mg. per drachm for infants up to one year of age, (2) capsules, each containing 250 mg. to children over 4 years of age.

Both antibiotics are effective in reducing the cough count but chloromycetin also lessens the whooping and vomiting and loosens the cough. Children receiving Aureomycin in powder form (spersoid) develop a voracious appetite.

Bromide intoxication Report of 36 cases.—Campbell reviews 36 cases of bromide poisoning. The symptoms of moderate bromide intoxication (blood bromide of 50 to 150 mg.) are: slowing of cerebration, impaired memory and concentration, nervousness, anorexia, sleep disturbance (insomnia or hypersomnia), dusky purplish discoloration of the skin, maculopapular or acne-like rash, headache, dizziness fatigue and irritability.

The symptoms of severe intoxication (blood bromide 150 mg. or above), in addition to the previous list, may include thickness or slurring of speech, change in personality, impaired sense of responsibility; rambling, irrelevant production of thought; confusion, hallucinations, delusions, disorientation, lethargy, confabulation, combativeness, excitability, and even delirium.

The neurologic signs of bromide intoxication are: unsteady gait, hyperactive or absent deep reflexes, tremors, generalized weakness, sluggish pupils, poor co-ordination, and nystagmus.

Conditions to be differentiated are schizophrenia, manic-depressive psychosis, alcoholism, paresis, encephalitis, Korsakoff's psychosis, and such organic lesions as brain tumor and subarachnoid hemorrhage. Most of the failures in diagnosis are due to the physician's failure to think of the possibility of bromide intoxication, and therefore omitting to request a blood bromide examination. Sodium chloride is a specific in the treatment of bromide poisoning; it literally pushes the bromide from the tissues. In the milder cases enteric coated salt tablets, each 15 grains, may be prescribed, two tablets 4 times per day. In the moderate and severe cases, however, it is usually wise to hospitalize the patient. Here, sodium chloride may also be given intravenously, either as normal saline, or in 2, 3, or 5 percent solution, usually 1,000 cc. per day. The mental symptoms are often aggravated by urging the treatment too rapidly, due to increase in the circulating bromide. The author uses normal saline intravenously plus salt tablets orally, or 2.5 percent sodium chloride, 1,000 cc. per day, intravenously. Using this procedure the lowering of the blood bromide is approximately 25 mg. per day. Removal of the toxic agent produces good results. Most patients, even with severe intoxication, recover within two weeks. The mortality rate is less than 1 percent and deaths are usually due to pneumonia.

The prevention of bromide intoxication is well within the power of the medical and pharmaceutical professions. Prescriptions containing bromides should always carry a

"do not refill" reminder to the druggist. The sale of bromides in the form of headache remedies has been encouraged since the sale of barbiturates has been restricted. The author feels that the sale of bromides should likewise be put under control. (Campbell, J. D., Atlanta, Ga.: Southern Medical Journal, 42: 967-972, November, 1949.)—*Medical Newsletter, U S O. I. S.*

Clinical evaluation of some antihistaminics and antispasmodics in Parkinson's disease.—(*J. Am. Med. Assoc.*, 144, pp. 5-8, 1950).

Antihistaminic drugs have been among the more recent drugs tried in the therapy of parkinsonism. Effron and Denker of the Bellevue Hospital, New York, reviewed the literature on orally and parenterally administered drugs which have been legion and report their own findings in 80 unselected patients with Parkinson's disease. 38 of these were of the postencephalitic, 21 were of the arteriosclerotic and 14 of the idiopathic type and 7 were syphilitic, malarial or traumatic. Most of these patients were in a fairly well advanced stage of the disease. Only 8 were subjects with only one limb involved who were able to carry on well with their usual functions. Of the remaining 72 patients 36 had more than one limb involved with considerable functional impairment and 37 were unable to carry on functionally or were bed-ridden. As each patient presented himself, all medication till then given, was stopped in order to establish a base line of his

status. Then one of the following drugs was administered:—Artane, of diphenhydramine hydrochlor (Benadryl), methaphrylene (histadyl), scopolamine hydrobrom, tripelemamine hydrochlor, phenindamine tartrate or mephenesin. If the results of any of these are favourable, the patient was placed on placebo medication, until patient returned to base line established for him. Then another drug was tried again followed by placebo medication and so on with other drugs. The final results were carefully appraised and showed that—

(1) Methaphrylene hydrochlor (Histadyl) and mephenesin were the least effective.

(2) Tripelemamine hydrochlor and phenindamine tartrate helped 30 per cent of the patients.

(3) Artane, scopolamine hydrobromide, and Benadryl were of value in 71.5 per cent of cases.

(4) Of the combinations tried, tripelemamine hydrochloride, and scopolamine hydrobromide resulted in improvement in about one half of the patients.

(5) Best results were obtained with phenindamine tartrate and artane; phenindamine tartrate and scopolamine hydrobromide; and diphenhydramine hydrochloride (Benadryl) and scopolamine hydrobromide. 80 to 95.5 per cent of the patients derived benefit from these combinations. However, the degree of improvement was greatest with phenindamine tartrate plus artane. (Artane is one of the new synthetic antispasmodic compounds, manufactured by Lederle Laboratories).

SURGERY

The modern treatment of hæmorrhoids.—For external piles, Oldham (1951) recommends conservative treatment if the hæmorrhoid is subsiding: if it is in the midline in front or behind where the operative wound is liable to be converted into a fissure; when associated with prolapse and thrombosis of internal piles; and when the hæmatoma extends round the anal margin. The treatment advocated is rest, the frequent application of cold compresses with an evaporating lotion, and regulation of the bowels. Thrombosed external piles require evacuation of hæmatoma under local anaesthesia. When excising external piles, the author removes sufficient skin to leave a pear-shaped wound. The operation is performed under local anaesthesia.

First degree internal piles with little or no bleeding are treated conservatively, with mild laxatives, a diet containing adequate fluids and fruit, restriction of meat, and avoidance of alcohol to reduce portal and rectal congestion.

Bleeding first degree and second degree piles are treated by injection of 5 per cent phenol in almond oil.

Third degree piles are treated operatively.

(Oldham, J. B., (1951), *Med. Press*, 225, 299.—*Medical World*.

Suppurative diseases of the lung—Advances in surgical management. G. Alfred Dodds, M.D., (From *The Journal Lancet*, November, 1950).

Surgical management of suppurative disease of the lung has progressed to the point where at present a degree of standardization has been reached with further advancement lying chiefly in the field of improvements in technical procedures.

Prevention of pulmonary suppurative disease is preferable to radical surgery as a cure. It has been shown that with complete atelectasis in the absence of associated infection suppuration does not occur. If, however, partial obstruction is produced in the presence of infection, pneumonitis then results, leading to extensive bronchiectasis in four weeks. These changes are reversible if the obstruction is relieved within seven to ten days. Applied clinically, all postoperative patients should be watched for evidence of obstructive pneumonitis with prompt correction of the same. Foreign bodies in the

bronchi must be removed at once. Children with measles and whooping cough should be closely observed, as they are candidates for pneumonitis which can develop into bronchiectasis. In lung abscesses it has been shown that the infective organism is found in abundance around the teeth, thus pointing to the necessity of adequate dental hygiene.

Bronchiectasis:—One of the outstanding accomplishments in thoracic surgery has been the excellent results obtained in the treatment of unilateral bronchiectasis. Once diagnosis has been established by a bronchogram and bronchoscopy has ruled out gram and bronchial secretions, are reduced with soon as bronchial secretions, are reduced with the antibiotics, the treatment is lobectomy. The use of tourniquet amputation of the hilum of the affected lobe has fallen into disuse. The present accepted technique is individual ligation of the vascular elements of the hilum of the lobe, followed by closure of the bronchus by end on silk sutures. Care is taken not to traumatize the bronchus by use of clamps. The bronchial stump is covered with a pleural flap, and rapid re-expansion of the remaining lobe of the lung is carried out through constant intrapleural suction. The use of antibiotics and refinements of technique has virtually eliminated postoperative complications of bronchial fistula and empyema. Present mortality rates are less than two per cent for lobectomy in unilateral bronchiectasis.

In the past four years the use of segmental resection has come into greater use in an attempt to conserve pulmonary tissue. This refinement is based upon the concept that there are within each lobe of the lung definite anatomical segments with their own bronchus, arteries, and veins, and that these segments may be anatomically removed without damage to adjacent lung tissue. According to the classification of Jackson and Huber, there are ten such segments in the right lung and eight in the left. Boyden, the right lung and eight in the left. Boyden, at the University of Minnesota, has made a monumental contribution to segmental anatomy of the lung. When consideration is given to the fact that the majority of pulmonary diseases have sites of predilection, then the reason for application of segmental resection becomes apparent. For instance, bronchiectasis usually involves the basal segments of the lower lobes. The lingula of the left upper lobe and bronchi of the right middle lobe are often involved. The superior divisions of the lower lobes and the anterior divisions of the upper lobes are common areas for lung abscess. Pulmonary cysts are frequently found in the superior division of the lower lobe.

Accurate delineation of lung segments is secured by bronchographic studies. Radioisotope localization has been found to be more accurate than the surgeon's impression at the time of thoracotomy. The technique widely used is that of positively identifying the segment, ligating the segmental arterial supply, severing the bronchus and with the

remaining portion of the lobe inflated, the segment is removed in a retrograde manner by finger dissection using the intersegmental vein as a guide. This procedure, while fine theoretically, does from the practical side carry a higher incidence of increased empyema, bronchial fistula, and unexpanded lung segments. Its greatest application is in bilateral bronchiectasis where maximum lung tissue must be conserved.

Bilateral bronchiectasis poses a more difficult problem. The majority of these patients have neglected their disease or have been mismanaged. Not only are many of these patients in poor general condition, but it is difficult to get adequate preoperative reduction in sputum volume using antibiotics in aerosol and parenteral form. When such a patient has obtained the maximum benefit of preoperative preparation a resection of the involved lung segments is done on the side showing the greatest extent of bronchiectasis. Following this there may be sufficient clinical and symptomatic improvement in cases having minimal involvement of the contralateral lung that further surgery is not required. In those cases in which extensive disease is in the lung segment on the opposite side, resection is performed six to nine months after the initial lobectomy. At the time of this surgery there is one main hazard, namely, cerebral anoxia, due to the limited amount of lung available for respiratory function. This is prevented during surgery by keeping the tracheobronchial tree free of secretions and frequent expansion of the lung with positive pressure. This is followed by vigilant postoperative care.

In bilateral bronchiectasis, with the plan of management as given, there will be an operative mortality of four per cent, and a patient mortality of seven per cent, as reported by Kergin in 94 resections in 58 patients.

Lung abscess:—The management of lung abscess has undergone revision since the advent of antibiotics. In chronic lung abscess external drainage has been superseded by primary lobectomy. This radical treatment is supported by lower mortality figures and the fact that external drainage will not correct the complications of bronchiectasis, multiple secondary abscesses, hæmorrhage and perforation. The disease should be attacked while confined to one lobe rather than resorting to pneumonectomy after an entire lung is destroyed. This fact is emphasized in a report of 16 pneumonectomies by Glover and Clagett. Of these, six died postoperatively, three died of brain abscess within five months, and three more died of various complications within six months. A good result; therefore, in their lobectomy for lung abscess there was a 95 per cent good result. The underlying principle in managing acute lung abscess is drainage. If this can be accomplished by medical management through the use of antibiotics supplemented by bronchoscopic drainage so much the better, but such therapy must result in progressive disappearance of all symptoms.

and all roentgenologic findings. If this is not accomplished in the maximum period of six weeks, then surgery is mandatory. If the patient is too toxic for resection, it is safest to perform external surgical drainage and follow later with resection. Touroff *et al* in a large experience with lung abscess have reached the conclusion, after ten years' observation, that in cases where antibiotic therapy promptly controls infection, primary lobectomy or segmental resection is the procedure of choice. In managing a lung abscess, particularly with a medical regime in the patient past forty, the physician must be cognizant of the fact that 15 per cent of bronchogenic carcinoma are manifest in this manner.

Pulmonary cysts:—Congenital cysts of the lung, while not primarily suppurative, ultimately reach this complication. The fact that these cysts are found to occur in infants establishes their congenital aetiology. They are sometimes associated with accessory lobes of the lung, and those occurring in the lower lobes frequently have an anomalous arterial supply. These cysts are lined with bronchial epithelium and may be single or multiple involving a lobe or an entire lung. Although most commonly seen in children, they may appear at any age, depending upon the advent of infection. Severe respiratory distress due to the size of the cyst may be the initial presenting symptom in infants. A large infected cyst may be mistaken for an empyema.

Once diagnosis has been established, the proper treatment is resection of the cyst containing segment of the lung. Lobectomy is well tolerated by infants and children. Ravitch and Hardy reported no operative mortality in 11 patients 13 weeks to 13 years of age, representing ten lobectomies and one pneumonectomy. Successful lobectomy has also been accomplished in a 15-day-old infant. —*General Practitioner.*

Delayed suture in the management of wounds—K. F. Dowry and G. M. Curtis (*American Journal of Surgery*, 8:280, Sept. 1950) report the results of delayed suture of wounds in 360 consecutive battle casualties with a total of 721 wounds. After the initial surgery (debridement) and dressing, the initial dressing was not changed or disturbed until the patient was brought to the operating room. Then the dressings were removed and the wounds were inspected; in 111, or 15 per cent of the wounds in this series (including those with obvious infection, immediate suture was considered to be contraindicated, and wet dressings were used for forty eight hours or longer. In 85 per cent of the wounds immediate suture was done. The majority of these wounds (583) involved the extremities; 450 were classified as "moderately severe," all of these involving deep muscle and fascia. In the study of results in these cases in which delayed suture was done it was found that, if the primary surgery or debridement had been adequate, the results depended chiefly upon the time interval between the primary surgery and the closure of the

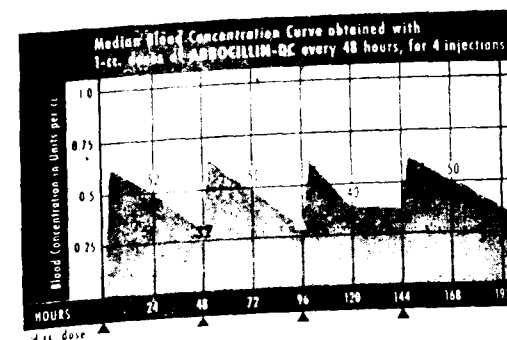
wound. The best results were obtained in the cases in which this interval was four to six days, with 97.4 per cent healing in this group. In the group in which suture was done within a three-day interval, healing was not as satisfactory as in the group in which suture was done in four to six days. In the latter, the tissues were found to be soft and pliable, were approximated without tension, and without undermining or wound "trimming." In wounds in which the interval between primary surgery and suture was seven days or longer, 86.7 per cent healed satisfactorily. In this group the tissues were not pliable but had become fixed, and freshening or excision of the edges of the wound and undermining of varying extent were necessary. Preoperative infection of the wound occurred in 16 per cent and postoperative infection in 21 per cent of the wounds. Local penicillin or sulfonamide therapy was not used, but the use of systemic penicillin or sulfa drugs made it possible to carry out adequate wound revision or drainage or removal of sequestration without a fatal, invasive infection developing. Of the patients in whom wounds were closed in six days or less 72 per cent returned to duty in an average of twenty-seven days; but when the interval was seven days or more, 49 per cent returned to duty in an average of thirty-two days. The excellent results obtained in these cases of delayed closure in the optimum time interval (four to six days) suggests that the principle of delayed suture might advantageously "be extended beyond the realm of traumatic surgery." —*Medical Times.*

Surgical treatment of hernia in the aged.—F. P. Sainburg (*American Journal of Surgery*, 80: 60, July 1950) reports a study of 142 cases of hernia in persons sixty years of age and over; the average age was 66.7 years. In 69 cases, the operation was done as a surgical emergency because of recent incarceration; in 48 cases an elective operation was done; in 25 cases no operation was done because of definite contraindications. In the 69 cases in which an emergency operation was done, there were 11 deaths, a mortality of 15.9 per cent; there were no deaths in the group in which an elective operation was done after careful preoperative preparation. A follow-up of 67.05 per cent of the surviving patients in both operated groups shows a recurrence rate of 13.3 per cent, which is lower than that usually observed in younger patients. While hypertension complicated by cardiovascular disease was considered to be a contraindication to operation, uncomplicated hypertension was not a contraindication to elective operation for hernia. The results obtained in this series indicate that elective operation for hernia should be done more frequently in older patients than it now is, and that such elective surgery after careful preoperative preparation may obviate the risk of an emergency operation. The indications for elective operation are "essentially the same" in the aged as in younger patients. —*Medical Times.*

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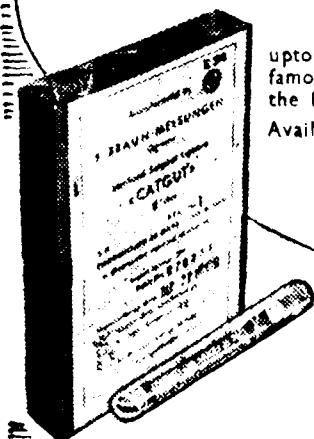


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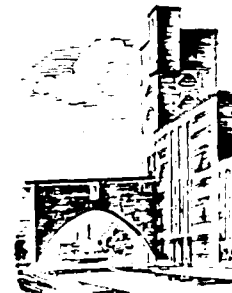
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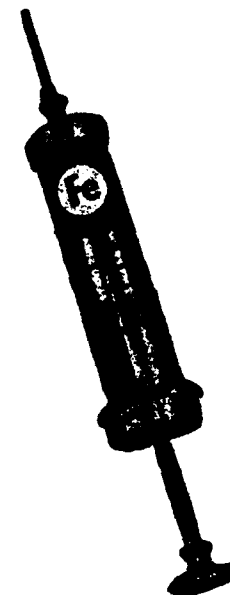
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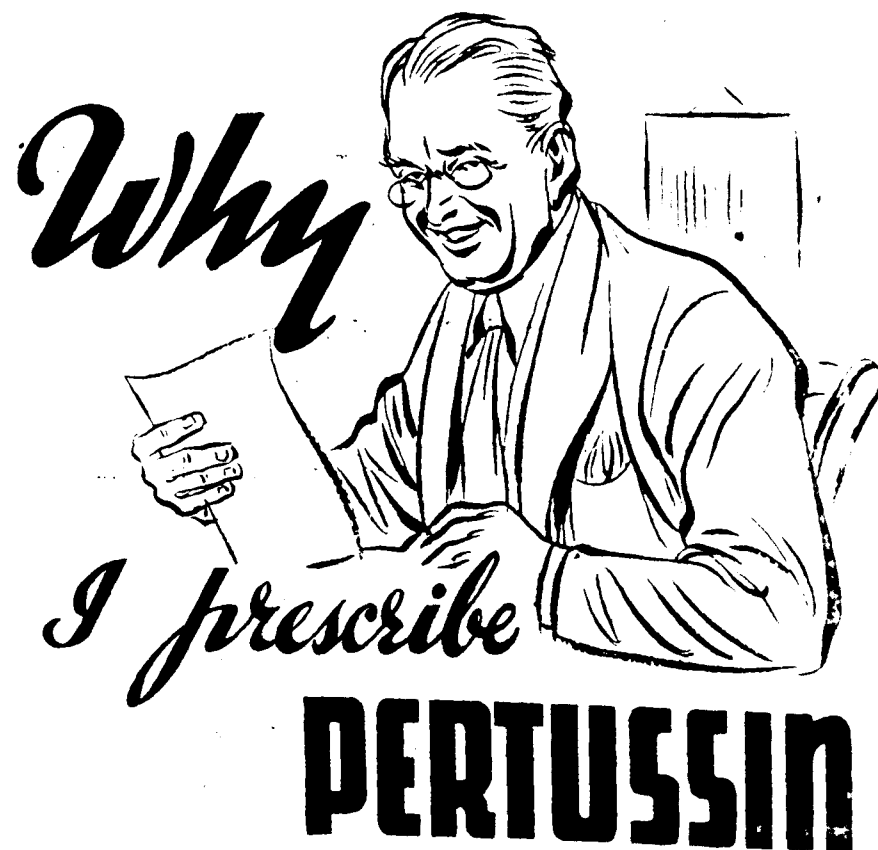


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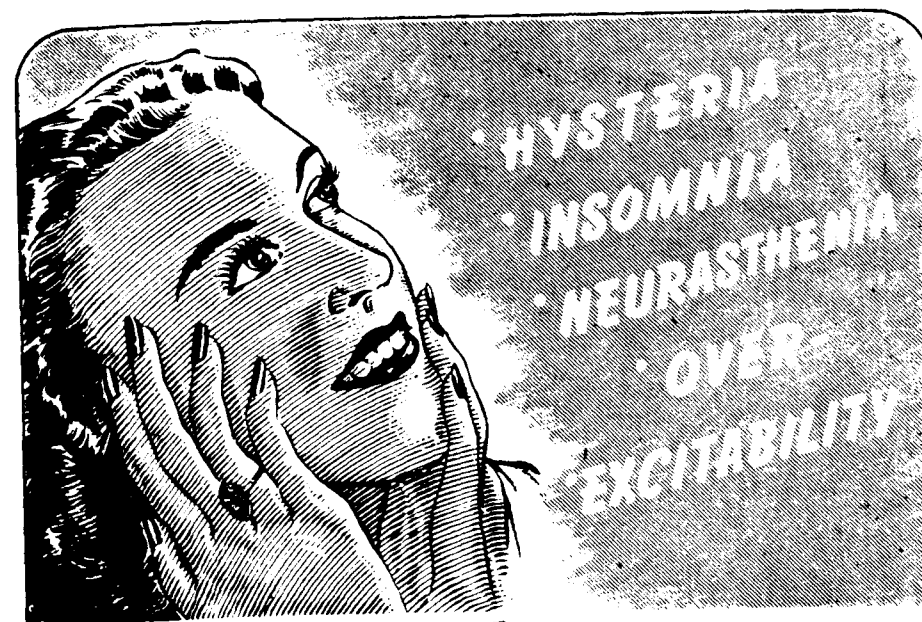
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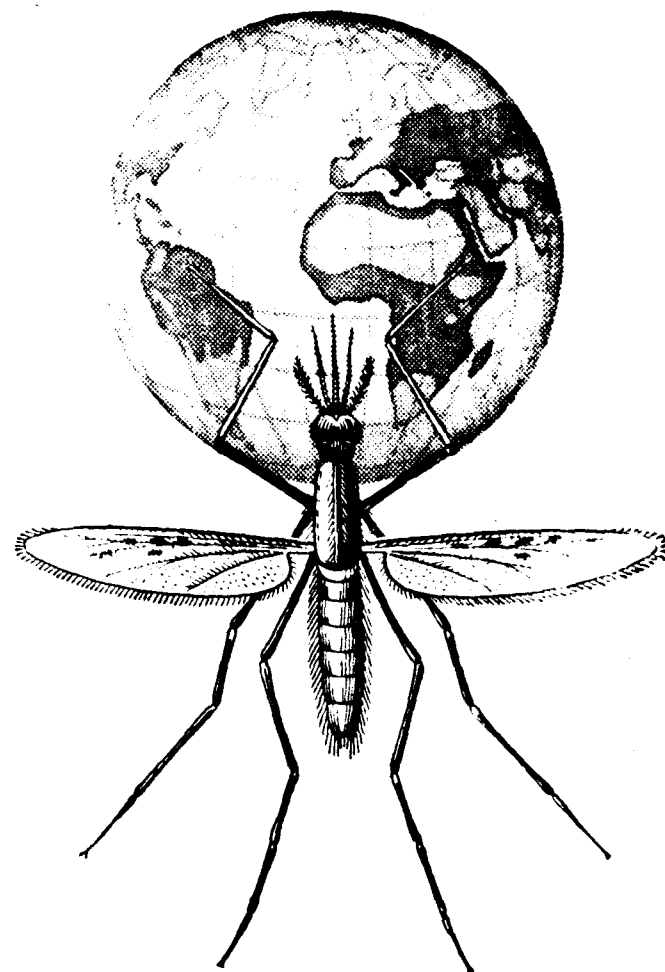
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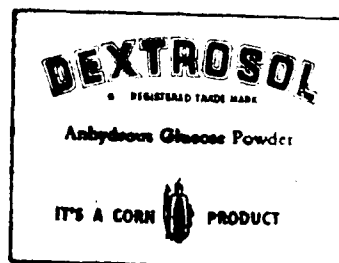
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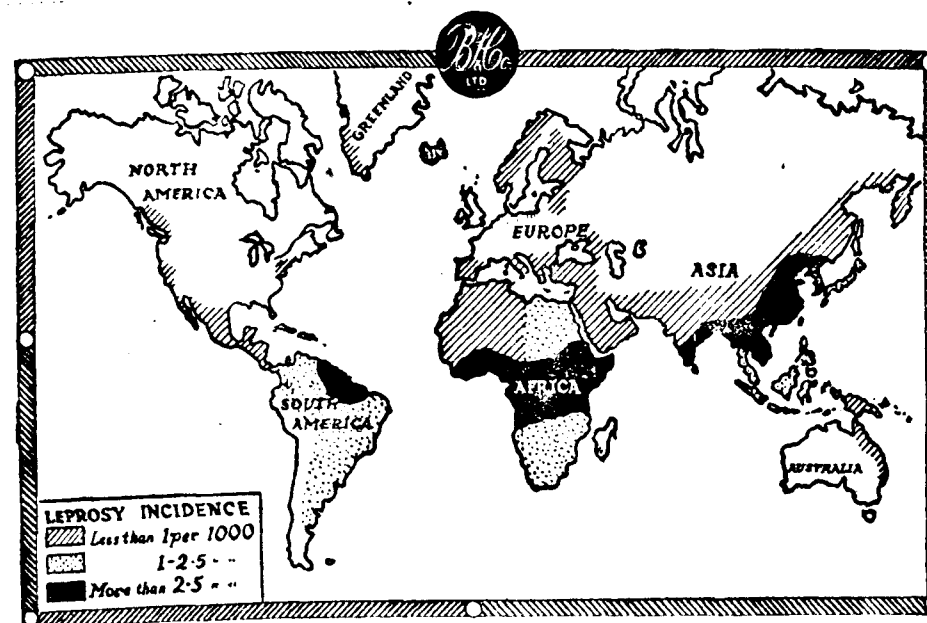
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1.7c.c. 5 amps 2-12 20 amps 10-8		P.D. Chloromycetin 12 Caps. bot. 29-12
Enterovioform 20 2-14; 100 tabs bot. 12-4		Benadryl 50 cap. 6-0; Combex 10 cc. 6-12
Clinical Thermometers ½ min:—		Benadryl Syrup 4 ozs. bot. 3-14
German Eng Japan, U.S.A. Zeal, Hick's		Dinaltin Sodium 100 caps bot. 6-0
Rs. 18-8 21-12 13-8 22-8 35-8 60-0 doz.		P.D. U.S.A. Ferradol 2½ lb. 15-4; 1 lb. bot. 7-12
Dihydro Streptomycin Merck's 1 gm. vial 3-8		P.A.S. Italy 100 gm. 6-4; 100 tabs. tin 5-0
P.D. 1 gm. „ 3-8		Penicillin Eye Oint. 0-12; Skin oint. tube 1-4
Pfizer 1 gm. „ 3-14		Penicillin Sodium Cryst. G.:—
Dakin's Chlorodine doz. 10-0		Merck's 1 lac. 2 lac. 5 lac. 10 lac.
Easton Syrup 1dr. 100 2-8; 1000 tab. bot. 21-0		0-12 0-13 1-8 2-10 vial.
Elastoplast 2½x5 yds. 2-4; 3x5 yds. tin 2-8		Pfizer's 0-14 0-14 1-9 2-11 „
Endo's Emitin Hydro ½ gr. 6x1 cc. box 2-4		Procaine Penicillin Aqueous:—
Eng. Acriflavine 500 2-8; 1000 tabs. bot. 4-8		Pfizer's 4 lac. 1 cc. 3 lac. 1 cc.
Aspirin 5x100 0-14; 1000 „ „ 6-8		3-2 3-0 vial
Caffein 100 2-4; 1000 „ „ 14-8		Phillip's Milk of Magnesia sm. doz 18-0
Eng. Procain Hydrochloride 1% 3cc. 25 box 4-8		Quinacrin USA 100 1-0; 1000 tab. USA bot. 9-8
Hydrageri Iodine Rubrum 12x1 cc. „ 0-4		Quinine Sulph Govt. B.P. 48-8; Std. lb. 42-8
Caffin Soda Benzotat 12 amps. box 2-4		„ „ Roche 73-0; Java 62-0; How „ 73-0
Sodium Cacodylate 12 x 1 cc. „ 2-4		„ „ Ind. 4-0; How 6-0; Bihydro oz. 8-4
Euquinine Holl. or Java 4-12; Roche oz. 5-10		„ Bisulph 2 gr. 100 3-8; 5 gr. 100 tab. 7-8
Eye Dropper USA type 0-5 Finger Stall doz. 1-0		„ „ 5 gr. 1400 tab. How tin. 65-0
Ext. Filisis Liq. 2-8; Iodine Cryst. oz. 1-14		„ „ 5 gr. 1000 tab. B.D.H. bot. 42-0
Ephazone 15 2-8; Digoxin 100 tab. bot. 4-10		„ Bihydro How 2 gr. 100 „ 4-0
Eng. Ephidrin Hydro ½ x 100 2-4; 25 tab. 1-0		„ „ 5 gr. 100 tab. „ 8-8
Emitin Hydro ½ gr. 12 tabs. tube 5-0		„ „ Italy 15 gr. 2c.c. 5 amps. box 1-0
Glaxo's Berin 1mg. 25 tabs. 0-9; 100 tabs. 1-2		„ „ B.W. 10 gr. 12x2 c.c. 5-0; Evans „ 4-12
1 mg. 500 „ 5-8; 1000 „ „ 10-12		„ „ 5 gr. 1cc. 6 amps. B.D.H. „ 1-14
Glycerine Plastic Syringe 1oz. 3-0; 2oz. ea. 4-2		„ „ 5 gr. 1cc. 100 „ B.D.H. „ 25-8
Hormotone Plain 100 8-4 "T" 40 tab. bot. 8-0		Quinine Bihydro 10 gr. 2cc. 100 amps:—
Hydrogen Peroxide Eng. 4 oz. 0-14; 8 oz. 1-10		B.D.H. Evans B.W. P.D. Ind.
16 oz. bot. 2-8		Ra. 30-8; 29-0; 39-0; 54-0 19-8 box
M & B 5 oz. 1-6; 20 ozs. 3-0		Rubber Gloves "7½" or "8" USA per pair 1-0
Hypo Record Needle Japan 2-8; Italy doz. 3-0		Saline 100 tabs. 1-8; B.A.D.P.S. 50 mgm. 100
„ „ German 2-8; Down „ 4-12		„ „ „ tabs. bot. 1-4
„ All Glass „ Japan 3-8; German „ 4-0		Saline Apparatus 300 cc. 8-0; 500 c.c. each 11-0
Hypo. Syringe All Glass Nacket:—		Scissors 5" 2-0; Scalpel 5" „ 1-12
C.N.:— 2c.c. 5c.c. 10c.c. 20c.c. 30c.c. 50c.c.		Sodamint 100 0-14; 1000 tabs. tin 2-8
German 1-2 1-12 2-8 3-12 6-12 9-8 5		Sulphadiazine 500 52-0; 1000 tab. bot. 20-0
Italy 1-10 2-10 3-8 5-8 8-8 11-0 *		Sulphaguanidine 500 tab. Boots or Eng. „ 18-12
Japan 0-14 1-5 2-0 3-0 5-8 7-8 h		Sulphanilamide U.S.A. 5gr. 1000 tab. „ 7-8
S.N.—Re. 1-0 More		„ „ Eng. 7½ gr. 1000 13-8; 500 „ „ 6-12
Hypo. Syringe LeurLock Nacket:—		Sulphathiazole Boots 500 tabs. tin 25-8
B.D. (C.N.) 2c.c. 5c.c. 10c.c. 20c.c. 30c.c. 50c.c.		Suture Needles 0-4; Saline Needle each 1-14
7-4 11-12 14-0 16-8 22-0 32-0		Saridon 10 Tabs 1-12 250 Tabs. bot. 33-0
7-4 11-12 14-0 16-8 22-0 32-0		T.C.F. Whole Liver Ext. 10 cc. vial 3-0
Lactopeptin Elixir sm. 34-8; lg. doz. 58-8		„ „ „ 5 Vit. B. Complex 10 c.c. „ 4-4
Lavandar Smelling Salt Eng „ 13-8		„ „ „ 5 Vit. B. Complex 10 cc. „ 4-14
Lexative Vegetable 100 2-0; 1000 tabs. bot. 14-0		Vick's Vaparo 28-8 Inhaler doz. 21-0
Leukoplast Elastic 3x5 yds. 2-0; 2½x5 tin 1-12		Wisdom Tooth Brush Adult „ 12-0
Lilly's Gentian Violet Jelly 4oz. tube 0-8		„ „ „ Junior „ 8-0
Lilly's Sulphanilamide Cream 4 oz. tube 0-8		Waterbury's Compound large „ 66-0
M. & B. 693, 100 tabs. 9-0; 500 tabs. tin 42-0		Wintrop's Atebrin 100 1-4 1000 tabs. bot. 12-0
„ Neptal 6 x 1cc. 2-8; 6 x 2 cc. box 3-8		Woodward's Gripe water „ 33-8
„ Acetylarsan 10x2cc. 4-12; 10x3cc. „ 7-4		Yeast Eng. 100 tabs. 1-0; 1000 „ bot. 6-8
		Zeal Lactometer 3-8; Campolan 25x2cc box 31-8

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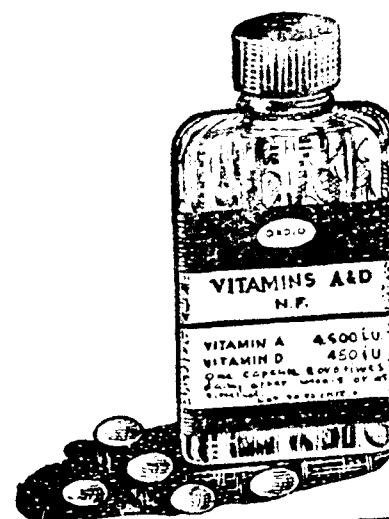
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"OXOID" Liver Extract (I.M.) is supplied in ampoules containing 2 cc. each also in bottles of 10 cc. and 20 cc.

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Each ampoule of 2 c.c. represents -

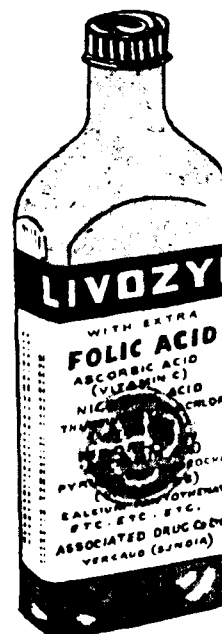
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VITAMIN B ₁	50 mg.
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VITAMIN C	100 mg.
NICOTINIC ACID AMIDE	50 mg.
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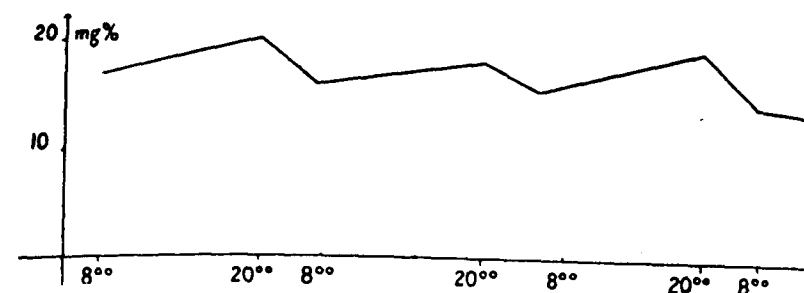
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P.A.C. is 100% active substance, each 100 G corresponding to 88 G of PAS and 12 G of Calcium.—It keeps stable in all climatic conditions.

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Dihydro Strepto. Pfizer. 3-12; Merck 3-3	.. Endo 6x 1/2 gr. 2-6 B.W. 1/2 gr. x 100 70-0
P.D. 3-4; Upjohn 3-4; Cheap 3-0	.. P.D. 1/2 gr x 6 7-0 1 gr x 6 11-0
Penicillin G. Sodium:—	Emetin Hydr. 1/2 gr. x 12 Eng. 8-0; 1gr. x 12 13-8;
1 2 5 10 lacs.	1gr x 25 BDH 15-8
0-12 0-13 1-6 2-8 Merck.	B.W. Emetin tab. H.T. 1/2gr. or 1gr. 6-8; Eng. 5-0
0-14 0-14 1-8 2-9 Pfizer.	Cibazol tab. 250 17-0; Enterovioform 11-4 100
.. Procain 3x1cc 4x1cc 15 20 30 lacs.	Berin 25 mg.x10cc. 2-8; 50 mg. 4-0; 100 mg. 6-4
2-12 3-0 6-12 9-12 13-8 Pf.	Calciolestin 6x1cc. 3-0; 15 c.c. 3-8;
2-14 9-8 Merck.	P.D. Adrenalin in Oil Amp. 6. 4-4
.. Oil 3 lacs x 10 cc. Pf. 11 Merck 10-0	.. Antuitrin 8. 18-0; Combex 10 cc. 7-0
.. B.W. 3 lacs x 1cc 1-12; 4lacs x 1cc. 2-4	.. Liver 2 USP. 4-11; 5 USP. 9-4
Penicillin Tab. Pf. 1/2 lac.x12 4-0; USA 1 lacx6 7-8	.. Livibron 6-8; Metatone 12 oz. 6-8
.. Eye Oint 8-8; Skin 13-8; Lozengies 500 11-8	Neohemoplastin 2 cc. 7-8; Takazyme 2 oz. 4-8
Aureomycin 8 Caps. 24-8 (Lozengies 500 11-8	Feradol Eng lb. 5-8; USA. 7-12; 2 1/2 lb. 16-0
Chloromycetin 12 28-12; Terramycin 16 38-8	Liqd. Takadiastus 4 oz. 5-0; 8 oz. 9-0
Quinine Bengal 48-8; Java 59-0 Howds 71-0 lb.	Gadusan 2 cc. 12-8; 5 cc. 12-8
.. os. Ind. 4-0; Howds 5-8; Bihydro os. 8-8	B.W. Cal. Gluconate 10% x 10 c.c. x 100 45-0
Quinine Bihydro Amps 100 x 10 grs. x 2cc.	Sandoz L. Ext. 10% 10cc x 100 110-0; 5 amp. 6-8
Ind. Alb. B.D.H. Evans B.W. P.D.	.. 10% x 5cc. x 10 10-12; 10 cc. x 20 Amp. 22-4
19-0 33-0 31-0 28-0 38-0 53-0	Oxoid Liver Ext. 5 USP x 10 cc. each 5-0
.. 100 x 5 grs x 1 cc. Ind. 14-0 BDH 24-0	Redoxan 6x2 cc. 5-4; 3x5cc 4-12; 25x5cc. 40-0
Pamaquinine Tab 300 1-2 10; Gr. BI. 14-0	Vit. B2 Roche (Beflavin) 50x10 mg. 20-0 box
Qu. Amps. Italy 15grs. x5x2cc. 1-2; 100 amps 26-0	Benerva 100 mg x5cc. 4-8; Synkavite amp. 5-8
.. Bisulph 2 grs. x 1000 S.G. Carnige 26-0	Bedome 100 mg. x. 5 cc. 4-10; 10 cc. 7-4
.. 2 grs x 100 3-4 5 gr. x 100 B.W. 7-0	Esavate cap. 20 13-8; 30 18-8; Hypobeta 8-8
.. 5 gr x 1000 BDH 42-0 Howds 1400 65-0	Suceta 1-4; Sulphathalidin 100 12-0; 500 48-0
.. 1000 47-0	Saridon tab 10. 18-8; 250 32-8; Cytoserum 9-8
.. Sulphate Java 3 1/2 gr. x 500 20-0; 1400 x 5 gr.	Vitamin B Tab. 500 USA. 1-8; Hemo .. 9-8
.. Bihydro 2gr. x 100 4-4; 5 gr. 8-0; Ben. 47-0	Nicotinic Acid 500 Tab. Eng. 4-4
Quinidine Sulphat. Tab 100 14-0 Powd oz 16-0	P.D. Chemequinine 3 tabs. 2-0
Eue Quinine Holland or Java 4-4 Roche 4-6	Campolan 5 x 2 cc 6-4; 25 31-0
P.A.S 100grms Italy Bayer Dumex Herts	Entodan 12-0; Novalgin 10x2 cc. 8-8
6-0 12-8 14-8 11-10	Salrgan 5x1 cc. 4-4; 5x2 cc. 6-0; 10 x 2 cc.
.. 100 Tabs. 4-8 8-8 9-5	Neosalvarson 15 1-12; 3 2-6; 45 2-11; 6 3-2
P.A.S. Amps. Cilag 5 amp x 10 cc.	Omnopon Amps. with Needles Comp. Tab 1-0
.. 250 .. 11-12; 500 21-0 Italy 1-8	B.W. Morphia Sulphate cum. Atropin 20x 1/2 gr 5-0
Atabrin Whinthrop 1000 12-0; 100 35-0	P.D. .. 20x 1/2 gr. 3-8; Ind. 2-8
.. Bayer 15 10-4 dz. 300 9-12; Bot 1000 19-0	Neohepeter 3x2 cc. 10-8; 10 cc. 14-8; Erythro-
.. Amps. 1 grm. x 5 3-12; 5 amp. 23-0	Hepeter 'T' 10 cc. 10-8 [gen 10 cc 3-4
.. 0-3 grm. x 2 2-8; 25 .. 10-0	Vitamin B complex 10 cc. USA. 6-0
Mepacrine ICI 1000 11-8; Eng. 1000 9-8	K. Amps. BW. 100x 1 cc. 25-0
Quinaerine MB 500 7-0 1000 11-8 USA 9-8	Chiniofonum Eng. (Yatrin POW.) 500grms. 15-0
.. 25 x 3 grm. 26-0; Mepacrine 2x5 1grm. 11-8	Aminophyllin Tab. BW. 25 2-0; 100 6-0
Paludrin 3 grms. x 500 26-0; 1000 x 1 grm 27-8	Amps. 6 x 2 cc. 4-12; 8 x 10 cc. 6-0
.. amps. 25 11-4; 5 amps 3-4; GL. 6-0	Camphor in Oil 100x3gr x1cc. 6-8 Cipla or Smith
U.S.A. Vit. B 12 30 M. x 10 cc 7-4; 50 M. 5cc.	Ethylechloride 100 grm. 3-8; 50 grm. 2-8
GL. .. x 6 amps 4-12; 50 .. 6 amps 7-8	Procain Hydrochlor 1% x3 cc. x 25 amp. 4-4
M & B. 693, 500 40-8; 760 500 37-0	Ljo Calcim with Gold 6 x 5cc. 7-4
N.A.B 15 1-3; 3 1-6; 45 1-9; 6 1-11	Distil Water 100 x 5cc. 7-0; 10 cc. 8-8; 2 cc. 5-8
Acetylarsen adult 7-4; Child 4-4	Normalsaline 100 x 5 cc. 9-12; 100 x 10 cc. 13-8
Neptal 6 x 1cc. 3-0; 6 x 2cc. 20-0	Glucose Sol. 100 x 25% x 25 cc. 25-0
Solusceptin 25 amp x 5 cc x 20% 44-8	Milk with Iodine 100 x 5 cc. 19-0; 10 cc. 26-8
Stovarsol Tab. 500 40-0; Sulphatriad 500 7-8	.. Inj. 100 x 5 cc 18-12; 10 cc. 24-12
Sulphanilamide Tab. 1000 Eng. 11-0 5gr. 10-8	Cal. Gluconate 10% 10 cc. x 100 17-14; 5 cc. 15-8
.. MB 500 6-8, Glaxo 1000 15-0; Pow. lb. 32-8	Asparine Tab. 1000 Eng. 5-4; BDH. 6-8; Howd. 9-8
Sulphaguanadine Eng. or Aust. 1000 18-8	Epedrin Hpdr. 1/2 gr x 1000 Ind. 10-8; USA. 15-0
.. 500 Eng. 18-0; M.B. 24-0; ICI 48-8	Calci Lactus 1000 6-0; Cal. Gluconate 1000 9-8
Sulphadiazine Eng. 1000 55-0; 500 AFD or BDH 48-8	Calomal 1 gr.x1000 8-8; Soda Mint Eng. 1000 2-6
ICI. Sulphamezathine 500 31-0 1000 42-0	Vegetable Laxative 1000 Eng. 13-8; 100 1-10
Sulphathiazole Boots 500 24-0; 1000 55-0	Yeast Tab. BDH 1000 7-0; Eng. 6-12
B.W. Sulphetrone 100 13-0; 5-8 doz.	Amidopyrin oz. 3-4; Antipyryn oz. 2-8
Sulphanilamide Cream 4 oz Lilly 6-8 doz.	Acid Chysophanic oz. 3-4; Protargol oz. 1/2 4-8
Gentian Violet Jelly Lilly 4 oz.	Arg. Nit Cryt. oz. 5-4; Argylol Eng. 4-8

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 Mercuriochrome 5 grm. 1-2; 10 grm. 1-8; 25 grm.
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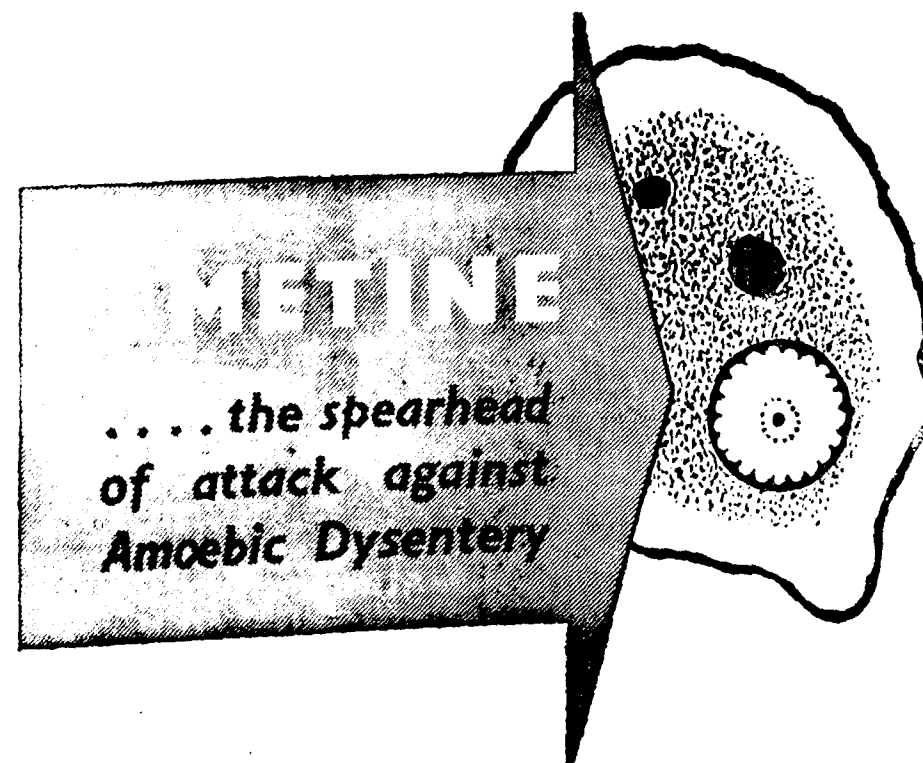
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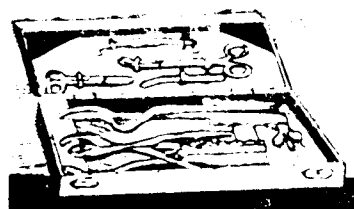
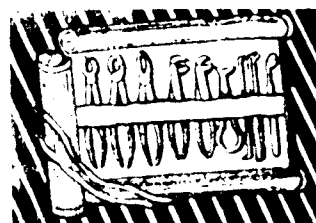
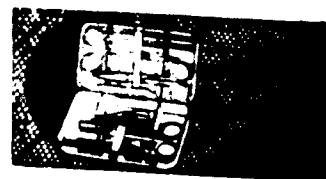


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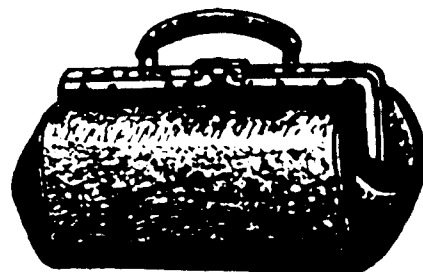
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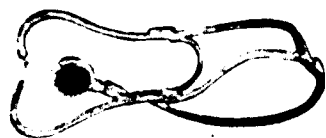
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Case 5. FIBROSITIS

Care of Dr. [Name], LCPS.

Age: 68 years. Sex: Male. Occupation: Retired IMD.

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- (ii) Pain in the lumbar region severe in all movements.
- (iii) Pain below the Rt. scapula.

History: Slight arteriosclerosis but no H.P. Previous history of Asthma and emphysematous chest.

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Local: Nothing could be detected except slight stiffness.

X-ray, blood and other reports and opinions of specialists: X-ray of shoulder joint—N.P. and pain was attributed to fibrositis either in muscle or bursa.

Urine: Few oxalates (treated). Electrocardiogram showed coronary along with other signs but no increase to call H.B.P.

Blood:—ve Kahn.

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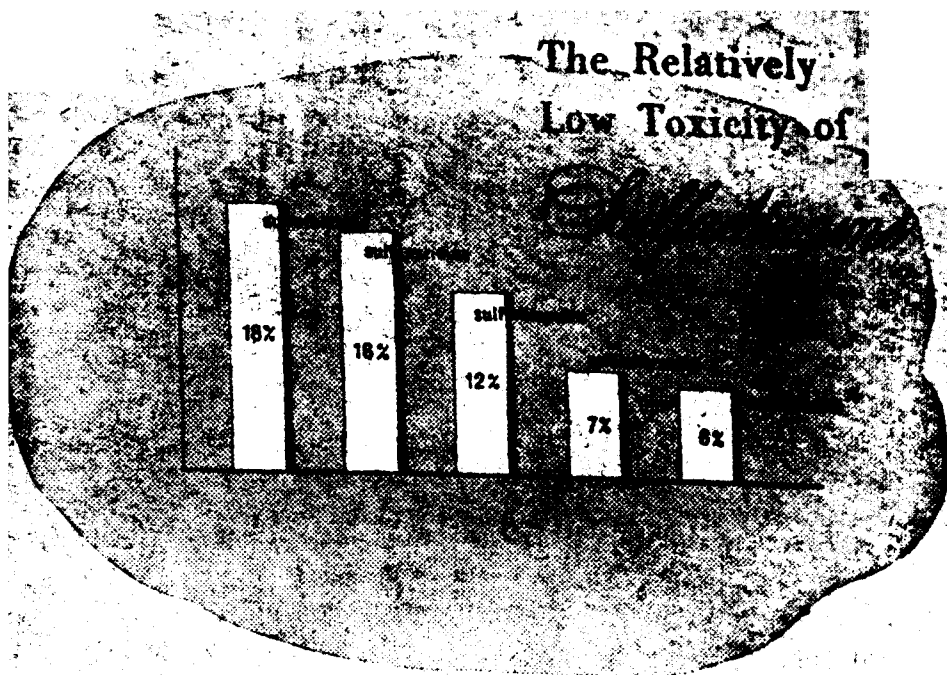
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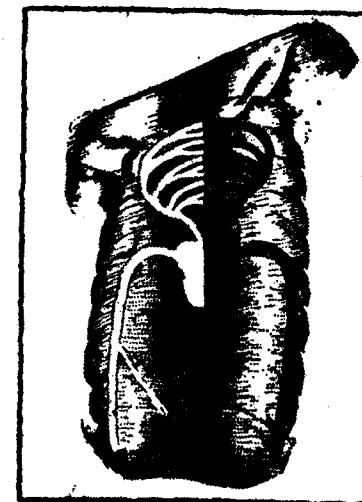
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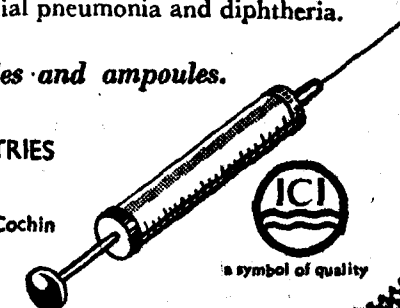
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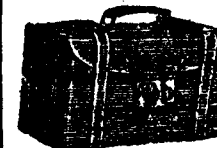
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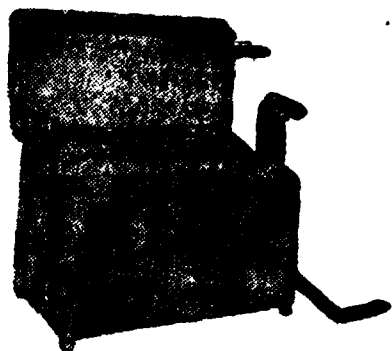
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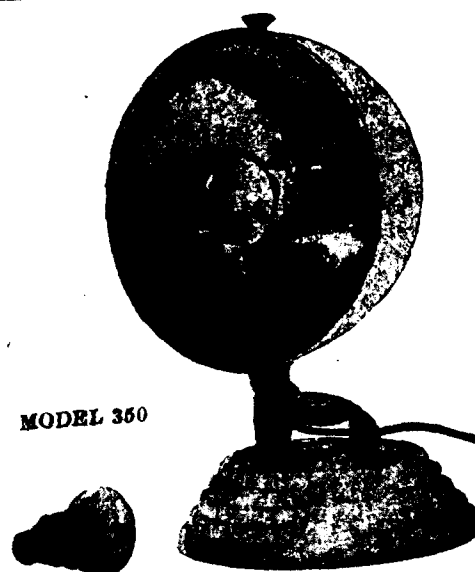
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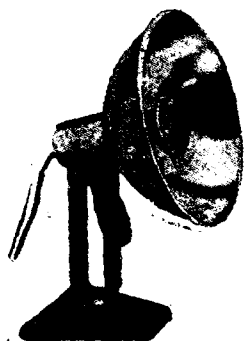
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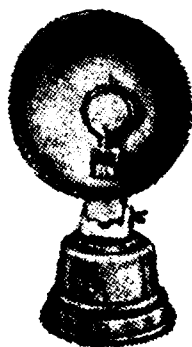
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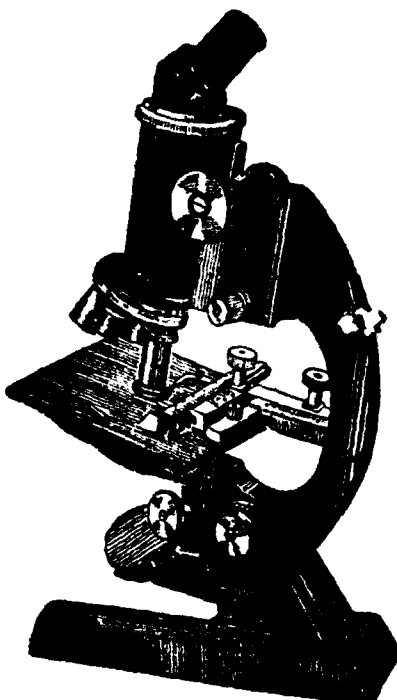
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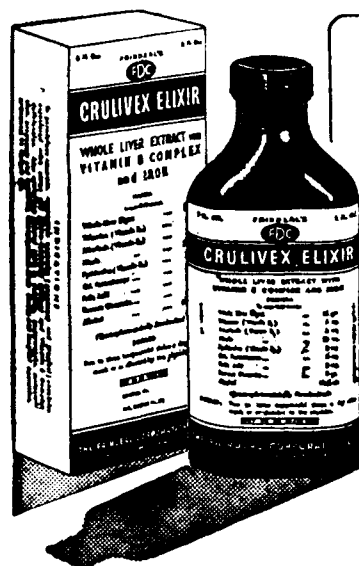
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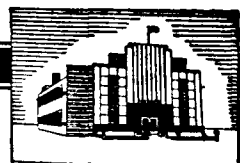
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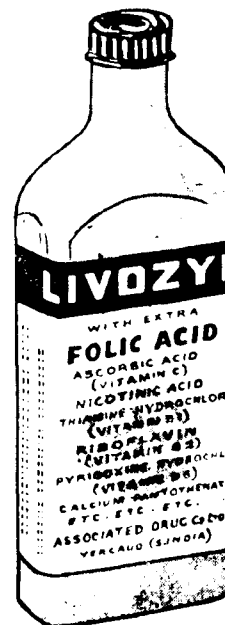
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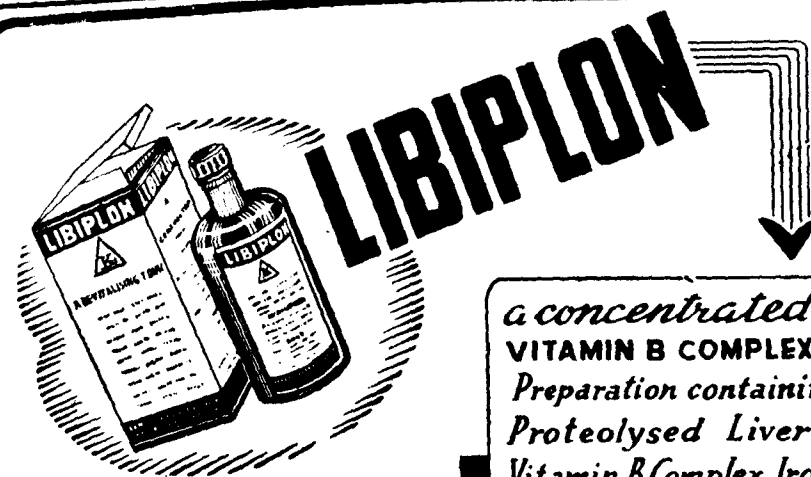
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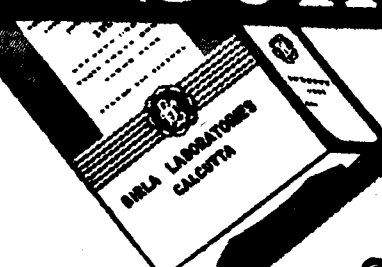
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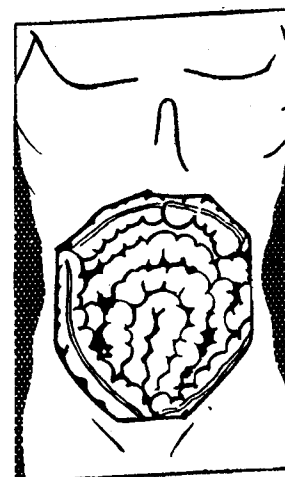
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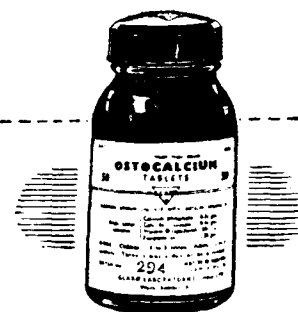
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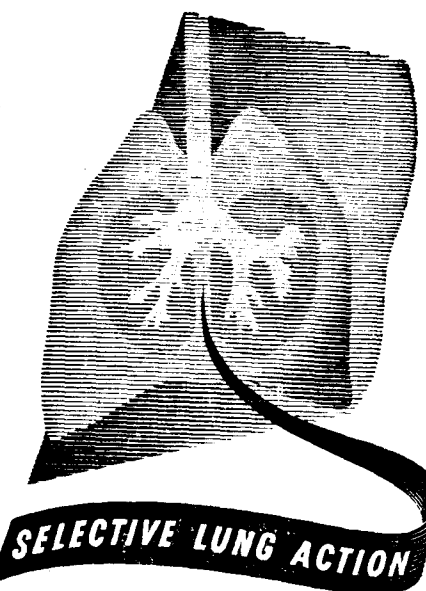
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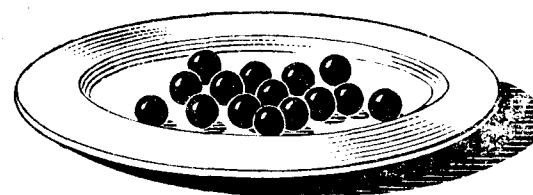
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AT LOW TREATMENT COST

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Tablets of 0.01 mg., 0.05 mg. and 1 mg. (scored) Tubes of 25. Bottles of 100.



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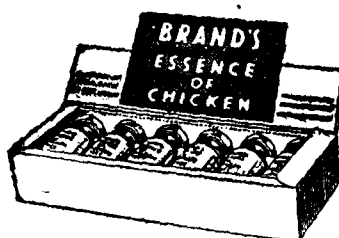
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PATIENTS suffering from nervous disorders of neurasthenic, hysteric or neurotic type frequently have accompanying digestive trouble. In such cases, it has been found that, as an aid to improved nutrition, 'Ovaltine' is unsurpassed, because it is so easily assimilated.

Containing a variety of vital food elements, which are frequently insufficient in the average day-to-day diet, 'Ovaltine' supplies these factors in the form of a delicious beverage.

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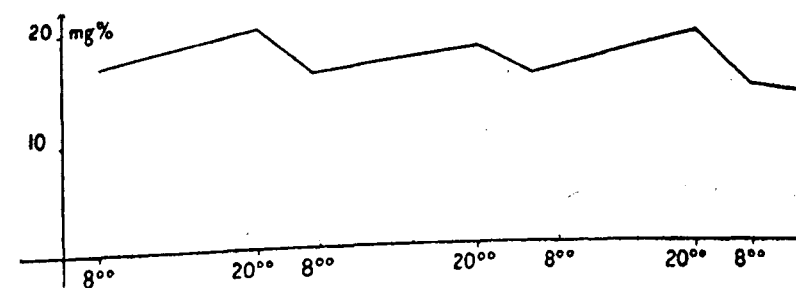
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A digestive hæmatinic tonic containing extract of the whole edible liver (goats'). Iron, Phosphates, Strychnine and Vitamin B Components etc. A remarkable tonic to aid and restore the functions of the digestive and the nervous systems and enrich the blood.

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The Antiseptic

ESTD. 1904.

A Monthly Journal of Medicine and Surgery

Published on the 15th of every month.

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Vol. 48

NOVEMBER, 1951

No. 11

Original Articles

THE PLACE OF ANGIOCARDIOGRAPHY IN CLINICAL MEDICINE *

A. N. K. MENON, M.B., B.S., D.M.B., D.M.R.D. (Lond.).

Lecturer in Radiology, Madras Medical College and Radiologist in-charge of
Diagnostic Department, Barnard Institute of Radiology,
Government General Hospital, Madras.

THE place of angiocardiology in clinical medicine (I include surgery also under broad title medicine) is unique as well as enduring. In no branch of radiology has more progress been made recently than in the diagnosis of cardiac disease in which the most outstanding achievement is angiocardiology or contrast cardiac visualisation. Angiocardiology has revolutionised the accurate diagnosis of congenital heart diseases without which intracardiac surgery, in which great strides have been made recently in the West, is not practicable.

Angiocardiology or contrast cardiac visualisation consists in the injection of an inert, non-irritating, non-toxic and rapidly eliminable dye into the venous blood stream and roentgenographic demonstration of the blood thus rendered opaque while it is within the heart chambers. The dye chiefly used is 70% Diadone.

TECHNIQUE.—Anæsthesia is used in cases of children under ten. Some specialists do a premedication with Nembutol. A sensitive test for iodine may be done before starting the process. If anæsthesia is not used, then the patient must be fairly intelligent

* Specially contributed to THE ANTISEPTIC.

and co-operative. He must refrain from making unnecessary movements. Rehearsals and training of the patient and X-ray team are required.

POSITIONING.—Postero-anterior and left anterior oblique have been found to be the most suitable positions.

APPARATUS.—At least a 50 c.c. syringe is necessary. A large wide bore needle at least 1 mm. wide or better a cannula with a side arm which can be connected to a saline drip to prevent blood clotting into the cannula, is necessary. Cephalic or basilic vein (ante cubital veins) is cut and the cannula is tied in the vein. The other end of the cannula is connected by syringe and the wide arm of the cannula to a saline drip. 30 to 50 c.c. of 70% Diadone is taken in the syringe (30 c.c. for children and 50 c.c. for adults). Withdraw a few cc. of blood which will flow to the top of Diadone and rapidly inject the whole of this Diadone within a course of 2 seconds (rate of injection about 30 c.c. per second). This very rapid injection of the dye permits an intracardiac concentration of the dye which is more radiopaque than the muscle mass of the heart. The injected dye will mix with the blood returning from head and neck when it reaches superior vena cava and with the blood of inferior vena cava when it reaches the right auricle. Within one or two seconds the dye reaches the right auricle. One second after the dye reaches the right auricle, it will reach the pulmonary arteries and about 4 seconds later in a normal heart it will be found in the left ventricle having passed through lungs, pulmonary veins and left auricle. Eight seconds after the injection it will reach the systemic circulation and distributed all over the body. Since these changes take place very rapidly, no single X-ray film can hope to show the whole train of events. Serial films must be taken at intervals of not more than one second if the path taken by the dye is to be followed in any detail. First exposure must be made just before the completion of injection and then proceed fast taking radiographs at least in intervals of seconds for the next ten seconds. Radiography can be carried out according to two main principles.

I. Direct radiography with normal full-sized X-ray films using a mechanical cassette changer.

II. Indirect radiography of fluorescent screen and in the latter case eventually with X-ray cinematography.

As pointed out by Barclay, Franklin and Pitchard (1945) direct radiography affords superior picture quality and presents possibilities of detailed study. Till recently only 1 and 2 radiographs per second could be taken and the slow speed was an adverse factor. But this defect has been rectified at Nortull Hospital, Stockholm, where they have now constructed an apparatus, which gives a speed up to 10 exposures per second. In clinical angiocardiology direct radiographic method gives valuable results concerning the physiological and pathological morphology of the chambers of the heart

and of great vessels as well as abnormal communications and alterations in the direction and course of blood flow. In the Nortull Hospital, apparatus synchronous serial exposures in 2 places can be carried out. The rate of exposure is ten per second. Exposure time is .02 second and sixty cassettes will be exposed during a period of six seconds which in children is the average time for the passage of contrast medium through both right and left side of the heart and cut through aorta with consecutive visualisation of all these areas.

View: L.A.O. view—k.v. = 70 k.v. for infants, 80 to 85 k.v. for children depending upon the size of the child. M.A. used varied from 300 to 450. Focus film distance varies from 100 to 120 cms. Size of film 13/18 cms. Because of the shortness of exposure, degree of clarity of the pictures is very high (blurring due to cardiac movement is practically eliminated). Radiographs give good detail and require no enlargement.

II. Indirect radiography of fluorescent screen (photofluorography):—Dr. A. T. H. Hills, Director of the Department of Diagnostic Radiology, Guy's Hospital, London devised an apparatus for angiocardiology in 1948 which is an adaptation of mass miniature principle of indirect radiography (Radiography of fluorescent screen), but the films size (5/5 inches) is large enough to be studied without magnification. The general construction consists of an Eastman Kodak Camera mounted vertically under a special trolley. A fluorescent screen is supported horizontally just under trolley top by a light proof tunnel at whose base is fixed the camera. X-ray tube is positioned over the screen at a distance of 30 inches. Maximum possible exposure is .5 second. Roll film is used and there is synchronisation of camera and X-ray unit. Average exposure factors for an adult are 50 m.a. second at 85 k.v.

Due to long exposure and the lack of brightness of the fluoroscopic screen photofluorographic pictures will not be so distinct and well defined like that of direct serial radiographs. Cineradiography which is the best indirect method is not practical at present since for satisfactory cineradiography at least 20 films must be exposed per second. But encouraging progress in the development of various methods of screen amplification to 500 times or more is being made in U.S.A. (by electronic magnification). This screen intensification will accentuate the place of photofluorography as a diagnostic aid and remove the barriers to practical roentgen cinematography. Dark adaptation will become unnecessary and will bring screen brightness within the range of gamma vision.

Contraindications to angiocardiology:—Liver damage, renal disorders and acute illness. The patient usually experiences such reactions as flushing and nausea. A transient fall of blood pressure may occur. Thrombosis of veins have been reported. Even sudden deaths had happened. But these complications are very rare.

Dr. Hills had 2 deaths in his first 37 cases. Professor Sosman of Harvard Medical School and Peter Bent of Brigham Hospital had no mortality in his first 100 cases. Sussman of Mount Siani Hospital, New York, U. S. A. has done 2000 cases of angiocardiology without a single fatality even though he uses Iodoxyl group of dye which produces more venous spasm than Diadone. Coramine and Adrenalin must be ready handy to central allergic reaction. According to Dr. Peter Kerley of Westminster Hospital, London, one of the authorities in cardiovascular radiology, angiocardiology must be done only in carefully selected cases under expert care and must not be done as a routine.

Clinical Uses and Indications

A. Accurate diagnosis of congenital heart diseases.—Till a very few years ago, congenital heart disease was of little general interest. Diagnosis was only of academic interest since the blue baby could have nothing done for him. Angiocardiology and recent advances in cardiac surgery and anaesthesia have thoroughly changed the whole outlook. Operations have been done in the heart with almost miraculous results in selected cases. Angiocardiology is useful not only in the diagnosis of the actual lesion but also in pre-operative investigations and in assessing the results of the operations. Angiocardiology is specially indicated in the diagnosis of (1) Fallot's tetralogy; (2) Eisenmenger's complex; (3) patent ductus arteriosus; (4) coarctation of the aorta; (5) septal defects; and (6) pulmonary stenosis. The following are the characteristic angiocardiological appearances which will help in the correct diagnosis of the above mentioned congenital heart diseases:

(1) *Fallot's tetralogy*:—This disease when correctly diagnosed holds out the best hope for surgery. The lesion is a combination of pulmonary stenosis, right sided aorta, enlarged right ventricle and ventricular septal defect. Angiocardiology shows the simultaneous specification of aorta and pulmonary artery, the aorta, much more so than the pulmonary artery on account of pulmonary stenosis. Descending aorta so far as iliac is often well outlined. The stenosis itself may be demonstrated if of the subvalvular type and the artery is dilated beyond the stenosis, but in the valvular type there appears to be a block with poor filling beyond. The course of the right sided aorta and any abnormalities of its branches can be well shown. This is of importance to the surgeon who is contemplating performing the Blalock's operation of anastomosing one of the aortic branches with a branch of the pulmonary artery. The right subclavian and the right pulmonary artery are the two commonly used for this operation.

(2) *Eisenmenger's complex*:—This is the same as Fallot's except there is no pulmonary stenosis; there is dilatation of the pulmonary artery. Blalock's operation is of no use in this condition.

Angiocardiology shows simultaneous opacification of the aorta and pulmonary artery, the latter is dilated and is more clearly outlined than in Fallot's tetralogy¹.

(3) *Patent ductus arteriosus*:—Angiocardiology presents a picture which occurs in no other condition. There is a distinct localised dilatation of the descending aorta. This may vary in size but its direction is always towards the pulmonary artery. This dilatation best seen in the LAO position is thought to be due to either to a diverticulum caused by the traction of the ductus or to the infundibulum of the ductus itself. The ductus is not seen apart from this bulge which persists after ligation of the duct. Very good results are seen after the operation which consists of tying the duct.

(4) *Coarctation of the aorta*:—This is a stenosis of the aorta at its isthmus, that is where the ventral and dorsal aortic meet in foetal life and also when the ductus arteriosus enters the aorta. Coarctation of the aorta has ceased to be of academic interest only since the introduction of successful resection of stenosed portion by Crawford and it has become increasingly important for the radiologist to make a correct diagnosis. Angiocardiology may prove to be of immense value not only in demonstrating the size of the constriction but also in providing evidence as to the extent of collateral circulation.

(5) *Septal defects*:—Angiocardiology demonstrates the enlarged right auricle, right ventricle and the pulmonary artery but does not give the exact size of the heart chambers. Cardiac catheterisation may show the catheter passing from the right auricle to the left auricle. This condition is not incompatible with a fairly useful life.

(6) *Pulmonary stenosis*:—Angiocardiology shows the dye in the right auricle and right ventricle but none in the pulmonary artery and its branches nor is the aorta outlined.

B. In the investigation of tumours of the mediastinum.—In the differentiation of mediastinal tumours from the aortic aneurysm angiocardiology plays a decisive part.

C. In the determination of the site and degree of obstruction of blood vessels like superior vena cava, angiocardiology is very useful.

In short angiocardiology is one of the milestones that punctuate the onward march of the clinical roentgenology of the heart and, without its aid, modern cardiac surgery which is such a great boon to the ailing humanity, is not feasible.

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ESSENCE OF INFANT FEEDING*

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THE subject which I have chosen for my paper on this occasion namely, Infant Feeding is no doubt one of great importance, but I may be pardoned if I venture to suggest that this subject has not been receiving the amount of attention it deserves in our country at the hands of the general practitioners who treat children in the course of their practice. Any one not necessarily a doctor, who has travelled in Europe and America is struck by the vast amount of knowledge on infant feeding made available to mothers through pamphlets, popular magazines, etc. It is to be regretted that our country compares rather unfavourably with the West in this respect for we have really scanty scientific information available to mothers in our country. In these few minutes allotted to me, I hope to give some suggestions regarding infant feeding which I hope will be useful.

Breast feeding.—Mother's greatest gift to her off-spring is her breast milk. It is sometimes a fashion in higher circles of society not to suckle their young ones, for some are "Can't be bothered" type or "Haven't any time" type and a few others are "I can't sacrifice my figure" type. On the contrary, there are mothers mostly in the villages, who suckle their young ones even up to the age of 4 or 5 years, probably due to ignorance or their popular feeling that future pregnancy can be avoided or their intervals prolonged.

The advantages of breast milk can be summed up by stating that it is the best, ready made sterile milk, well balanced in proteins, fats, carbohydrates, vitamins and salts and does not need much knowledge or preparation in giving the feeds. Gastro-intestinal and deficiency diseases are comparatively less in a breast-fed baby than in an artificially fed one. To ensure a proper supply of milk in the mother, her health has to be cared for with proper food, vitamins and iron during the ante-natal period and the care of the breasts and nipples during the later months of pregnancy and post-natal periods.

The causes of failure of lactation are often in the mother but sometimes in the child. For instance, the mother may be psychologically incapable of suckling the child or she may be very anæmic which in turn reduces the milk supply. Infections of the breasts and cracked nipples which later become infected prevent proper suckling due to the unbearable pain which it produces. The child is unable to grip the breasts in the mouth if they are either poorly developed or the nipples retracted. In the child congenital malformations in the mouth and palate and infections of the tongue like

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thrush may prevent the proper action of suckling there by reducing lactation. The child may be too weak due to prematurity or other defects in the development which prevent normal breast feeding.

Colostrum, which is secreted from the breasts in the first 3 or 4 days after parturition, has an immunizing property and so must be given to the infant even though it is in small quantities. These few days will also be a practice period for both the mother and the child for cultivating the art of suckling and when true milk flows the child would have by that time gained experience.

Breast milk must be given at regular intervals of 3 or 4 hours and 5 to 7 minutes at each breast at each time must be spent. The proper timings would be 6, 9, 12 (noon), 3, 6, and 9 p.m. six feeds in all if the infant is small and less than 6 pounds at birth. Otherwise 4th hourly schedule is better, 6, 10, 2, 6, 10 p.m. 5 feeds in all. At night a feed can be given at 1 or 2 a.m. but it must be supplemented with sugared water or bottle feed when the child is of 2 or 3 months of age. After each feed the child must be held over the shoulders and slightly patted on the back so as to get rid of the swallowed air. If the child does not show any gain in weight on breast milk alone, such an infant must have feeds in addition to the breasts, (complementary feeds). In such cases cow's milk should be given in proper dilutions of 1 part of milk to 1 part or 1½ parts of water with a teaspoonful of sugar added to 3 oz. of the formula. Humanized dried milk powders like Similac, Sunshine Glaxo, can be supplemented in place of cow's milk where good milk is not available. Breast feeding must not be continued after 9 months and weaning should be commenced at the end of 6th month and completed by the 9th month. It is because the breast milk is not only not sufficient to the infant but also is deficient in iron. This is the period in which the child has to get accustomed to solid mixed feed and it is the correct period for such a feeding.

Overfeeding on the breasts is not so common in this country as underfeeding due to nursing mothers being underfed and anæmic. The infant who is overfed shows a rapid gain in weight out of proportion to age and height, passes frequent loose, large stools of normal colour and a tendency to regurgitate the excess at the end of the feed. This can be rectified by reducing the number of feeds to four and by prolonging the intervals of feeding.

An underfed infant is always below the average weight, always hungry and is either constipated or passes small greenish 'hunger stools. This can be overcome by giving 'complementary feeds'. Or such an infant 'test feeding' is made. The test is made by weighing the child before and after every feed on the breasts (with excreta included during weighing by not changing the napkin) for 24 hours and the amount of breast milk the infant has taken per day is calculated. A single test feed is not enough.

Artificial feeding.—In giving feeds five fundamental principles must be adhered to and they are:

1. Energy requirement. 2. Protein requirement. 3. Inorganic salts. 4. Vitamin requirements. 5. Fluid requirements.

I feel that in general most practitioners lean too much on vitamins and minerals in prescribing a suitable diet to the infant, forgetting the essential energy and protein requirements.

Energy (caloric) requirement in different age groups is as follows:

Premature infant	60 cal. per pound of body weight.
Below 6 months	45-50 cal. per pound of expected body weight.
6 months to 1 year	40-45 cal. do.
After 1 year	1000 cal. and 100 cal. per year of age.
6th year	1500 cal.

Protein and fat requirements are very well covered in $1\frac{1}{2}$ ounces of milk per pound of expected body weight and the infant gets more than $1\frac{1}{2}$ ounces per pound if calculated correctly.

Fluid requirement—3 oz. per pound of body weight to a maximum of 40 oz. per day.

Most of the vitamins and essential inorganic salts are found in cow's milk except vitamins 'C' and 'D' and iron which must be supplemented.

To sum up a 10 pound baby's diet can be calculated as follows:

Energy required:—50 cal. per pound or $50 \times 10 = 500$ cal.

Sugar required:—1 oz. for a 10 pound infant. 1 oz. yields 120 cal.

The remaining caloric needs are made up by milk given (1 oz. yields 20 cal.)—380 cal. or 19 oz.

Fluid requirement for a 10 pound infant is $10 \times 3 = 30$ oz.

So the milk water ratio must:—Milk 19 oz.; water 11 oz.; sugar 1 oz. per day to be given in 5 feeds, once in four hours.

The milk must be boiled so as to destroy the germs and reduce the chances of tubercular infection. Milk is received raw and not pasteurised in this country and "no raw milk is safe". In addition all the utensils must be well washed with boiling water. If the child is on bottle, the teats must be boiled and kept immersed in water.

In addition vitamin C in the form of half an ounce of orange juice and vitamin D in the form of two teaspoonfuls of Cod-liver-oil is given. To prevent milk anaemia, as both breast and cow's milk are deficient in iron, ferrous salts are given frequently.

Cow's milk, water ratios to be given during the first year can be summed up roughly by stating that during the first 3 months—1 part of milk to $1\frac{1}{2}$ parts of water. Second three months—equal parts of milk and water. Third 3 months— $1\frac{1}{2}$ parts of milk and 1 part of water. After 9th month whole milk can be given.

The amount of sugar added will be approximately one teaspoonful to every 3 oz. of the formula.

If good cow's milk is not available dried milk powders are preferable. A knowledge of the composition of these dried milk powders in the market like Glaxo, Cow and Gate, etc. is essential and will pay dividends. The practice of switching from one to the other in the hope of finding something suitable is to be highly deprecated, and so is the occasional suggestion that breast milk is not suitable when confronted with diarrhoeal or other disorders in the infant. The following dried milk powders are in common use and recommended:

1. *Humanized dried milk powders*:—In general one measure (supplied in the tins) to one ounce of water reconstitutes a mixture equivalent to that of breast milk.

Similac (one measure to two ounces of water), Allenbury Nos. 1 and 2 (1 measure to 6 measures). S.M.A. (Wyeth) Ostermilk.

2. *Dried milk powders*:—One measure to one ounce of water reconstitutes a mixture equivalent to one ounce of cow's milk. Cow and Gate full cream, Klim, Lactogen, Sunshine Glaxo composition modified for the use of young infants.

3. *Condensed*:—(evaporated) milk. *Sweetened*:—(Milk Maid).

Advantages: (1) Keeps for a long time and no need for refrigeration and so useful in villages. (2) Has a high caloric value.

Disadvantages: (1) Too much of carbohydrates which causes fermentation and fermentative stools. (2) Rickets and scurvy occur if given for a long period.

Unsweetened:—(Ideal).

Advantages:—Correct amount of sugar can be added later and adjusted.

Disadvantages:—Does not keep for more than two days outside the refrigerator.

4. *Dried milk with low fat*:—Used for sick infants. Cow and Gate half cream, Glaxo half cream, Horlicks malted milk (contains fully dextrinized starch).

Feeding during the first 3 weeks and the amount of the artificial milk does not depend on the caloric requirement of the new-born but on the physiological capacity of the stomach. If the new-born is on the breasts there is no trouble, for the infant takes in as much as it needs.

Capacity of the stomach: New-born a third of an ounce. 4th day $1\frac{1}{2}$ oz. 7th day 2 oz. 20th day about 3 oz.

The amount given must not exceed the physiological capacity of the stomach during the first three weeks. On the first day only sips of glucose water are to be given.

The milk which is most suitable for infants other than human milk is the cow's milk and is widely used. Buffalo's milk though given to infants in some parts of India is not quite suitable due to the high content of fat as shown in the chart below. Goat's milk can be given to infants allergic to cow's milk.

Chart 1. Composition of milk of different mammals (Human, Cow, Buffalo and Goat)

Name of mammal	Protein G%	Fat	C.H.O.	Moisture	Ca	P	Iron	Cal. per oz.	Vit. A I.U. per 100 G.
Human	1.0	3.9	7	88	0.02	.01	0.2	19	2.8
Cow	3.3	3.6	4.8	87.6	0.12	.09	0.2	18	180
Buffalo	4.3	8.8	5.1	81	0.21	.13	0.2	33	162
Goat	3.7	5.6	4.7	85.2	0.17	.12	0.3	24	182

—Health Bulletin 23.

Mixed feeding.—Infants are able to digest cereals even in an early age, as early as fourth or fifth month, and so mixed feeding with solids can be started safely by the sixth month. In the West like Great Britain and America the first infant's cereal foods are all proprietary foods which are well balanced in vitamins, proteins calcium, iron, etc. For example, in England it is "Farex" and in Canada and U.S.A. it is "Pabulum." It is not possible for our people to spend money on these prepared infant foods for they are prohibitive in price and also not available even in the cities. The common cereals given to infants in South India are given in a tabular column below:—

Chart 2. Common cereals given to children

Name of cereal	Protein G%	Fat	C.H.O.	Ca.	Iron mgs%	Vit. A I.U. per 100 G	Vit. B micrograms per 100 G	Cal. per ounce
Rice	6.9	0.4	79.2	0.01	1.0	0	80	99
Ragi	7.1	1.3	76.3	0.33	5.4	70	420	98
Arrowroot	0.2	0.1	83.1	0.01	1.0	—	—	95
Barley	11.5	1.3	69.3	0.03	3.7	—	450	95
Sago	0.2	0.2	87.1	0.01	1.3	—	—	100
Wheat (whole)	11.8	1.5	71.2	0.05	5.3	108	540	98
Wheat flour	11.0	0.9	74.1	0.02	1.0	—	120	99
Cholam	10.4	1.9	74.0	0.03	6.2	136	345	101
Oatmeal	13.6	7.6	62.8	0.06	3.5	trace	975	106

—Health Bulletin 23. (Govt. of India).

In South India the first infant solid food varies with the provinces. In Karnataka (South Kanara and Mysore) common food is ragi. Tamilnad—Sago (tapioca) and rice. Travancore, Malabar and Cochin—Banana powders and arrowroot. In Andhra—Sago and rice.

Rice is given in most homes in the form of rice "congee". This contains the added water which is not strained. The 'congee' or gruel is made into a fine semi-solid consistency with the help of the country-made mortar and pestle. A little salt and a teaspoonful of ghee are added. In some homes the rice is soaked in water for sometime and then dried in the Sun. The dried rice is powdered and then stored for use. Usually 2-3 tablespoonfuls of the powdered rice is mixed in 8 oz. of milk and boiled with constant stirring. This forms a thick creamy substance which is given to the infant with 3 teaspoonfuls of sugar or a little salt.

The preparation of ragi (Eleusine Coracana) for infants, known as ragi 'Manni' by the women of Karnataka is a tedious process. Ragi is soaked in water for sometime and then ground into a pulp. This pulp is strained in a sieve so as to remove the husk. The strained fluid is allowed to settle and the settled mass is tied in a fine cloth so as to allow the water to drain. The solid mass in the cloth is kept overnight during which period it gets slightly fermented. The mass is then made into small rupee-sized tablets and dried in the Sun. These tablets are used for preparing the infant food—2-3 tablets, powdered and dissolved in 8 oz. of milk and then boiled with constant stirring. This ragi food, semi-solid in consistency, is given to infants with a little sugar or jaggery added.

In Travancore and Cochin, some families give powdered Bananas. The Bananas (Kunnam variety) are peeled, sliced and dried in the Sun and later powdered. This is given to infants mixed with milk and a little sugar.

It has been found by experience that ragi is very good as an infant food on account of its fairly good protein content, Vit. B, palatability and is easily digestible especially when malted.

The infant's food given mostly in South India is deficient in proteins. It contains carbohydrates in large amounts with very little proteins, fats and vitamins.

Chart 3. Foods containing high percentage of protein

Animal	Protein	Pulses	Protein	Nuts	Protein
Meat	18.5	Soyabean	43.3	Almonds	20.8
Fish	20.0	Grams	22 (app)	Ground	26.7
Eggs	13.3	Peas	19.7	Cashew	21.2
Skimmed milk powder	28	...	...	...	...
Cheese	24.1	...	...	...	...

—Health Bulletin 23.

As shown in the above Chart No. 3 animal foods and pulses contain a high percentage of proteins. Soyabean will go a long way to replenish the deficiency if powdered and mixed with the cereal given to the infant as food. Meat and fish should be given

in the form of extracts for younger infants. Pulses are given to infants in the form of fluid extract (*rasam*) and to older children in the form of *dahi*—solid part mixed with rice. Egg yolk for infants can be started in the 6th month mixed with milk and for older children in the form of poached or boiled egg. Vegetable extracts given in the form of soups.

Sample diet lists for an infant 8—12 months and a child 1—1½ years are given below. Here each infant should be considered as an individual and the feeds given according to its needs.

Time	8—12 months	1—1½ years
6-7 a.m.	Milk formula 6-8 oz.	Milk formula 8 oz. Biscuits or rusk.
10 a.m.	Milk formula 6-8 oz. Biscuits or rusk	Rice congee 8 oz. or ragi food 8 oz.
1 p.m.	Rice congee or ragi food 6-8 oz. or any cereal food and Veg. soup or meat extract.	Cereal or rice and dahi water or rice and buttermilk and veg. homogenised of meat.
3 p.m.	Juice of one orange with 3 oz. of water.	Juice of 2 oranges with 3 oz. of water.
6 p.m.	Same as 1 p.m. feed.	Same as 1 p.m. feed.
10 p.m.	Milk formula 6-8 oz.	Milk formula 8 oz.

After 1½ years the child starts taking adult food. The increase in the infant's diet must be made very gradual.

In short, while charting a diet for the growing child the following daily dietary requirements should be kept in mind. (From Food and Nutrition Board of National Research Council, U.S.A.).

Protein 2 grams per kilo. Fat and carbohydrates are very well covered if the caloric needs of the infant are met. Minerals: calcium 1 g.; phosphorus 1.5 g.; iron 10-20 mgs.; iodine traces.

Vitamins A.	Thiamine HCl.	Riboflavin.	Nicotinic acid.
↓	↓	↓	↓
3000-4000 I.U.	5-1 mgms.	2 mgms.	10 mgms.
C. → 50 mgs.	D → 400-800 I.U.		

Giving of castor oil and gripe-water as a daily routine is not only not necessary but harmful. Giving of coffee as an infant's diet is also to be discouraged as it does not contain enough calories, besides being harmful.

Feeding of premature infants

Premature infant, an infant below 5½ pounds, requires special care regarding feeding. The caloric requirement is a little more than that of the mature infant, 60 cals. per pound. For the first 12 hours the infant should not be fed. For the first 12 hours Glucose water, 1-2 teaspoonful should be given. After 24 hours, if the infant is able to suckle breast milk should be given every

3 hours. If it is unable to suckle, breast milk is fed with the help of an ink filler or medicine dropper or by 'gavage' feeding through a stomach tube if the baby is too small. The premature infant should be fed every 2 hours if below 3½ pounds in weight and every 3 hours if above it.

In the hospital for sick children in Toronto, Canada, the most satisfactory food for these infants has been found to be a mixture of two-third parts of breast milk and one-third part of full strength protein milk till the child is able to suckle. If the child is on artificial milk the following are recommended:

Lactic acid milk	Partially skimmed milk.
Frailac (Cow and Gate)	Humanised milk powder.

Feeding of sick infants.—If the sick infant is on breasts, it must be continued for there is no better food to the infant than the mother's milk. It is wrong to blame the breast milk for any gastro-intestinal disturbance in the infant. The only contra-indication to feeding on the breasts is tuberculosis of the mother or any infections of the breasts like breast abscesses and cracked nipples. Only addition to breast milk food is warm water with some sugar added.

Care should be taken in choosing the appropriate diet if the sick infant is on artificial milk.

In high fevers not associated with diarrhoea and vomiting there is no change in the infant's food, which is mainly liquid. If the child is unable to tolerate the full cream milk, half cream milk or skimmed milk or dried milk powders with low fat content can be given. Cow's milk diluted with barley water is given and I have found it very useful for it supplies the caloric needs of the infant. Maximum fluids are essential and 10% Glucose water with orange juice is very helpful.

In cases of indigestion, hydrochloric acid milk is suitable (2 drops per oz.). Lactic acid milk and buttermilk are also given with success.

In severe cases of diarrhoea and vomiting no feeds should be given by mouth for 12-24 hours and the fluid loss is replenished by the I. V. and S. C. routes.

In mild cases milk is not well tolerated and so should not be given.

The following are given with benefit:—

Lactic acid milk, buttermilk, buttermilk powders, (Eledon and Beurlac), Eleden (Nestles), (Cow and Gate), Beurlac.

Protein milk, arrowroot congee may be given diluted with buttermilk but the child should not be kept too long on arrowroot congee alone.

The advantages of giving buttermilk over full cream milk or cow's milk in digestive disorders are the following:—

(1) Forms finer clot; (2) does not neutralise the acidity of the stomach and so aids digestion; (3) more digestible due to low fat; (4) favourable influence on the flora of the intestine; and (5) buttermilk powder when mixed with rice water exercises a powerful constipating effect.

It is commonly seen in practice that chronic diarrhoeas lead to a great loss of proteins and the infant becomes oedematous, when kept too long on arrowroot congee and barley water producing the common arrowroot and barley congee syndrome. The loss of protein should be replenished and the following are a few suggestions:

Plasma I. V., Casec, meat extract, soyabean, skimmed milk powder and milk protein by mouth.

Infants who are allergic to cow's milk or in cases of asthma or allergic skin conditions goat's milk or skimmed milk can be given.

In coeliac syndrome (pancreatic fibrosis and coeliac diseases) the following are recommended:

Skimmed milk, buttermilk, protein milk and banana powders.

Infant stools:—Stools of the infant depend on the type of food it takes.

Normal breast fed:—First five days—Meconium is passed—greenish stick stools.

After 10 days 4–5 stools, brownish slightly acid stools, scrambled egg appearance with no smell.

Normal bottle fed:—1–2 stools a day, dark yellow or brownish stools, normal homogenous consistency with a slight odour.

Too much fat intake:—Fatty stools. White and dry and sometimes loose, large and greasy.

Fat undigested:—Soft, yellowish white curdy stools.

Too much protein in the diet:—Stool curds are large, hard and tough-size of beans.

Excess of sugar:—Loose, frequent, greenish, frothy, sour, and fermentative and are passed with considerable gas producing irritation and redness of the buttocks.

Diarrhoea stools:—Loose, frequent, watery, greenish yellow stools with small curds.

Dysentery stools:—Blood and mucus mixed with loose frequent stools with tetanus.

Inactive liver:—Pasty white or pale yellow stools.

This subject of infant feeding is really so vast that my treatment of it during the short time at my disposal is necessarily sketchy. To deal with the subject exhaustively here is not my object. My object rather is to stimulate interest in this all too

important subject so that every practitioner of our country who plays a part in building up the health of our infants may bring to bear on his work a really enlightened mind fortified by all the well documented facts on the subject. If this paper has succeeded in stimulating this interest I shall consider my labours to have been amply rewarded.

I thank Dr. S. T. Achar, M.D., F.R.C.P. (C), Prof. of Pædiatrics, Madras Medical College, for his valuable suggestions.

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Of Dr. U. L. Narayan Rau,
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Late Sequelæ of Blood Transfusions and of Subcutaneous Hæmotherapy

Familial catastrophes due to sensitivity to Antigen Rh., are reported in a very informing article by Lacomme and Boreau. Their report is based on 20 families with 'hæmolytic disease' in the new-born infants due to sensitization of the mothers to the Rh factor. The adult mothers had received transfusions of blood in 15 cases; eleven of them were so treated in the course of obstetric management. The transfusion preceded pregnancy in 3 instances and was the only sensitizing factor detected. These three women had 7 children five of whom died; two who were given exchange transfusions survived. Combined sensitization of the mother in response to transfusion of Rh positive blood and to being pregnant with an Rh positive foetus occurred in the remaining 12 cases. Although the 15 women had 23 living children born before the mothers had been given blood transfusions, 26 of 35 infants born after the mothers had been given blood transfusions, died. *Subcutaneous hæmotherapy* was practised in 4 women when they were children of 8 to 10 years. Death of seven new-born infants resulted from sensitization of the mother to the Rh factor. One sterile woman submitted to subcutaneous hæmotherapy with her husband's blood after which she conceived thrice. The first infant was still born, and the other two died several hours after birth. The husband of the woman was a homozygote. These observations suggest that no blood be given to a female adult or child without previously determining the Rh group. *Subcutaneous hæmotherapy* should be cautioned against, except when there are major indications for it.—(Eng. Abst. Presse. Medicale, Paris, 58, p. 549, 1950).

"SPA - TREATMENT"

A Plea for Its Study and Development in India

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(Continued from page 813 of Oct. '51 issue)

PART II

Resources in India

A LARGE number of thermal springs occur in India and interesting legends have grown round each of them. As early as 1850, the Geological Survey of India interested themselves in the subject and a list of over 300 hot springs was published by Oldham¹ in 1882. This list was revised and made up-to-date by La Touche² in 1918. In 1932, Dr. K. S. Ray contributed an exhaustive article on this subject³. The radio activity of some of the mineral springs of Bombay⁴, Sind and Baluchistan^{5,6} have been determined by Rev. Dr. A. Sierp and Dr. Steichen, while those of Rajgir (Bihar District) have been reported by Prof. N. C. Nag⁷ and N. K. Chatterjee⁸.

Between 1939 and 1941, the Geological Survey of India undertook a survey⁹ of the thermal springs of India. Dr. P. K. Ghosh and his associates surveyed most of the important springs of Bihar, Bombay, the United Provinces, Central Provinces, the Punjab and Bengal. The samples of water were examined chemically by the King Institute (Guindy), the Public Health Laboratories (Poona), and the All-India Institute of Hygiene (Calcutta). The examination at Guindy included the spectroscopic test to detect elements that may be present in traces.

According to Dr. Ghosh, there are four main broad belts in which the majority of mineral springs in India occur:

- (1) Bihar—(a) In a belt more or less parallel to the coal-field boundaries; (b) Rajgir; and (c) Monghyr.
- (2) Along the West Coast of India in the Ratnagiri, Thana, Colaba and Surat districts.
- (3) In the Sind Baluchistan area.
- (4) In the Himalayan Belt.

A small number of springs occur also in the Mahanadi valley in Orissa, in Chittagong district and in isolated areas in Assam, in West Bengal, in Sikkim and in parts of South India. It is reported that at Manikaru (Kulu) the temperature of the spring is so hot that pilgrims cook rice in the hot springs which emerge from the shingle bed close to the ice cold stream of the Parvati river. The hot water is led into the neighbouring temple and rest-houses for baths and is reputed to be efficacious in cases of rheumatism. In Poonch, a thermal spring (Tattapani) discharges sulphurous waters. Hot sulphurous springs are reported to be quite common, throughout the tertiary

formations of Sind and Baluchistan on the West and in Assam and Burma on the East. The "Sohna" spring in the Punjab issues out at a temperature of 111°F. and is reported to be able to cure skin diseases. "Suraj Kund" at Hazaribagh discharges water at 173°F. and contains Sulphureted hydrogen and carbondioxide.

The mineral springs in South India have yet to be systematically studied. A warm (140°F.) spring which occurs at Gundala on the bank of the Godavari river is concealed in sand. A shallow excavation is made to reach it every year during the Sri Rama Navami Festival. Several warm springs are reported to exist in the Kurnool district. At Tiruchendur, on the eastern sea-shore, can be seen the curious phenomenon of a small well, known as "Nazhi kinar", situated at a corner of the big temple well and yielding a water very dissimilar to that of the bigger well. The water of this small well is rich in alkalinity and contains sulphureted hydrogen. A well whose water is believed to be useful against heart and kidney troubles has been reported from Surangudi in Tirunelveli District. Recently water from a well in Maddepalli near Anantapur received publicity in the newspapers as a cure for asthma. A well in Vadalur (South Arcot District) is claimed to be an excellent appetiser.

Many of these springs in India have enjoyed a therapeutic reputation from the remote past and have become places of pilgrimage. The claims of the healing properties are, however, not based on any scientific evidence since the subject has not been investigated critically. The importance of a scientific study of this subject was urged as early as 1932 by a Conference of the Indian Medical Association. Dr. Ghosh's demonstration that many of the mineral waters in India are analogous to those of established "spas" in the West supports the desirability of a critical evaluation of the therapeutic claims.

To enable a scientific study of this subject, it is essential to develop at least a few selected springs so that the patients could stay for sometime and undergo the bath-treatment under the supervision of qualified medical men who could notice the beneficial effects, if any. Such development and the provision of hotels, rest-houses and parks would prove worthwhile, even apart from the aspect of enabling a proper study of the subject. They would provide healthy holiday resorts which our country needs in the increasing tempo of modern civilisation. Many of our thermal springs are situated amidst picturesque surroundings and within easy reach of important towns. Their development can be expected to be a very effective method of attracting tourists to our country.

The development of these springs can best be undertaken by the local authority or the Government. Such development would not only be worthwhile in the interests of the country, but—judging from the response obtained by Dr. Ghosh who tried an experiment of sending our bottled mineral waters—may even prove a profitable undertaking.

APPEN

Province and district	Name of spring	Temp. °F	Gases if any
Assam—			
Oachar	Kopili group 1	128—130	
Sibsagar	Nambor 1	98—110	Copious
Baluchistan—			
Bolan Pass	Kirtal	Hot	—
Kachi	Lakha 1	Hot	—
Las Bela	Kan Berar	—	—
Sibi	Khattan 1	109	—
Uch	—	—	—
Bengal—			
Birbhum	Tantipara group 1	128—162	—
	Agnikund 2	159.8	CO ₂
	Brahmakund 2	105.9	None
Ohittagong	Bharatkund 1	Cold	Copious, inflammable
	Balwakund 1	Cold	—
	Naulakha 1	Warm	Inflammable
	Kaurikund 1	Hot	Do.
	Dudhikund 1	Cold	—
	Brahmakund 1	Very hot	Inflammable
	Chandrakund 1	Cold	—
	Surajkund 1	Hot	Inflammable
	Sitakund 1	—	—
Darjeeling	Mechi 1	—	—
Jessore	Minchu 1	—	—
Bihar and Orissa—	Khajura 1	82	—
Atymallik	Deolijhari 1	134	H ₂ S
Cuttack	Atari 1	138	Do.
Hazari Bagh	Durai 1, 2	110—115	H ₂ S intermittent
	Hatakauna 2	71.6	None
	Indra Jurba 1	Tepid	—
	Katkam Sandhi 1	110	H ₂ S
	Kawa Gandhwani 2	95	Slow continuous bubbles of H ₂ S
	Lurgurtha 1	116	—
	Patalpur 2	81	—
	Parasnath 2	68	—
	Pindarkun 1	160	—
	Sosonia 1	—	—
Manbhum	Surajkund 2	173	H ₂ S
	Charak 2	100.4	H ₂ S and CO ₂
	Sheopur 2	104	Do.
	Tatloi 1, 2	140	Do.
	Usir 2	87.8	Do.
Monghyr	Bharari 2	149	None
	Bhimband 2	125—147	CO ₂
			Do.
	Bhowra West 2 and East 2	110.4—111.2	CO ₂
	Lachmiswar Kund 2	152.6	None.
	Philipskund 2	55.0	CO ₂
	Rameswarkund 2	111.2	Do.
	Rishikund 2	105—113	Do.
	Shringirikund 2	87.8	Do.
	Sitakund 2	112.2	None
Palamau	Jarom 1, 2	132	CO ₂
Patna	Brahmakund 2	108.5	H ₂ S and CO ₂
			Intermittent N ₂ water issues through spout
			No gases seen
	Chandaramakund 2	104.0	Do.

DIX

Radio activity Radons m. Me/l	Characteristics of water	Therapeutic reputation
—	Slightly sulphurous	
—	Sulphurous	
—	Strong sulphurous	
—	Very saline and sulphurous	
—	Sulphurous	
—	Saline	
—	Contains H ₂ S	
2.806	—	{Cures skin diseases, digestive disorders and rheumatism
0.792	Brackish, sulphurous and chalybeate	Diuretic and slightly aperient
—	—	
—	Saline	
—	Saline, sulphurous and chalybeate	
—	Saline	
—	Saline and chalybeate	
—	Saline	
—	Saline and chalybeate	
—	Pure and limpid	Cures rheumatism and skin diseases
—	Deposits iron oxide	Cures gout and rheumatism
—	Carbonated, sulphurous	
—	Contains iron	
3.28	Sulphurous and saline	Cures skin diseases, digestive disorders and rheumatism
0.345	Sulphurous	
—	Brackish	Cures skin diseases, digestive disorders and rheumatism
8.56	—	
—	Saline	
10.38	—	
0.0197	Slightly chalybeate and sulphurous	
—	Do.	
1.41	—	
1.150	—	
1.2274	—	
0.246	—	
7.779	—	
0.2903	—	Cures skin diseases, induces appetite, corrects metabolic errors, gout, rheumatism, etc.
0.7654 to 1.224	—	Do.
4.45	—	Do.
9.27	—	Do.
3.046	—	Do.
7.85	—	Do.
3.6 to 5.1	—	
3.05	—	Do.
7.85	—	Do.
17.7	—	Cures rheumatism, paralysis, skin diseases, osteoarthritis, diabetes, leucoderma.
6.87	—	Do.
6.59	—	

APPEN

Province and district	Name of spring	Temp. °F.	Gases if any
Bihar and Orissa—cont.	Gangakund ²	107.6	Intermittent N ₂ water issues through spout No gases seen.
Rajgir Group	Makhdum ²	96.8	Do.
	Surajkund ²	105.8	Do.
	Viswamithrakund	106.7	Do.
	Vyaskund ²	105.8	Do.
	Jamunakund ²	106.7	—
	Ganeshkund ²	?	H ₂ S
	Markandeyakund ²	71.6	—
	Ramkund (Hot) ²	89.6	—
Gaya	Ramkund (Cold) ²	74.3	—
	Sitakund ²	104.0	—
	Tapoban Brahmakund ²	116.6	None
	Agnikund ²	122.0	H ₂ S and CO ₂
Bombay—			
Ahmedabad	Harsol ¹	80-90	—
Broach	Kawal	Cold	—
Cutch	Muhrr ¹	Warm	—
Kaira	Lasundra Group I	100-122	—
	" II	104	—
	" III	87-114	—
Kathiawar	Tulsi Sham ¹	124	—
Kolaba	Pali ¹	108	Unpleasant
Panchmahals	Sapi ¹	—	—
	Tuwa ¹	Hot	Sulphurous
	Arauli ^{1,2}	104	do
	Khed ^{1,2}	95.9	CO ₂ and H ₂ S
	Rajapur ^{1,2}	140	do
	Rajwadi ^{1,2}	134.6	—
	Sangameswar ^{1,2}	125.6	CO ₂ and H ₂ S
	Turai ^{1,2}	141.8	do
	Unari ¹ or Unhar ²	156.2	do
	Anavali ¹	—	do
Surat	Kokner ¹	Hot	—
Thana	Satiwadi ¹	Hot	—
	Vizrabhi ¹	110-136	H ₂ S
Central Provinces—			
Chindwara	Anboni ^{1,2}	132.8	CO ₂ and H ₂ S
Hosangabad	Anboni ^{1,2}	113.0	do
Surjunga	Tatapani ¹	130-190	do
Yeotmal	Khair ¹	87	Smell of H ₂ S
Hyderabad—			
Gulbarga	Wujal ¹	Warm	—
Warangal	Baiora ¹	110	—
Kashmir—			
Bathstan	Askoli ¹	104.5	Emits H ₂ S
Bisilo Behisteil ¹		160	do
Changchengmol ¹		120-150	Carbonated
Chutran		110	—
Duchin		154	—
Kashmir	Islamabad	Tepid	Sulphurous
Khorkan		185	—
Ladakh	Knarung	Tepid	—
Nubar	Chusan	167	—
Pampur		70	—
Rupahu	Puga	80-174	H ₂ S
Madras—			
Bellary	Ramandurg	—	H ₂ S
Godavari	Gundala	140	—
Hindupur	Well in Maddepalli ⁴	—	—
Kurnool	Kalva	—	—

DIX—(Contd.)

Radio activity Radons m. Mo/l	Characteristics of of water	Therapeutic reputation
3.58		Cures rheumatism, paralysis, skin diseases, osteoarthritis, diabetes leucoderma.
4.13		Do.
6.20		Do.
1.38		Do.
3.58		Do.
3.6		Do.
?		Do.
1.73		Do.
1.0035		Do.
Trace		Do.
6.20		Do.
6.1022		Do.
4.234		
	Peculiar taste	Preventive of hydrophobia
	Saline	
	Saline	
		Cures skin diseases
	Sulphurous and saline	
	Sulphurous and saline	Cures skin diseases
	—	Cures skin diseases, rheumatism, gout, paralysis, obesity.
	—	Induces appetite.
Nil		
Nil		
Nil		
Nil		
0.806		
—	Sulphurous	
—	Saline	Induces appetite.
—	—	Cures skin diseases
—		
—	Clear but acid taste	
—	Insipid	
—	do	
—		
—	Deposits borax.	
—	No smell or taste.	
—	Slightly chalybeate. Deposits sulphur	
—	Deposits sulphur	
—	Deposits sulphur and gypsum	
—		
—	Faintly sulphurous	
—		
—	Colder springs deposit borax	
—		
—	Slightly chalybeate and carbonated	
—	Smell of H ₂ S	
—	Alkaline water	Useful in asthma and tuberculosis
—	Deposits calciferous tufa	

APPEN

Province and district	Name of spring	Temp. °F	Gases if any
Madras—(cont). Kurnool—cont.	Lanjibanda	88	—
	Mahanandi	89	—
Tirunelveli	Nazhi Kinar	—	H ₂ S
"	Well in Surangudi ²	—	—
Punjab— Gurgaon	Sohna	115	Faint H ₂ S mainly CO ₂
Kangra	Jwalamukhi	—	—
	Lausa	72	—
	Tiva	108	—
	Tatwani	120	—
Kulu	Bashiaht	138	H ₂ S
	Khelat	104	—
	Manikaru	106.5-202	H ₂ S
Mianwali	Bakh Ravine	94	do
Spiti	Changhizang	—	do
Patiala—	Pinjaur	—	—
Simla Hill States—		—	—
Bashahr	Jaori ¹	130.5	—
Bhaji	Suni ¹	135	—
Bilaspur	Bhaara ¹	—	—
Rajputana— Mewar	Gangar ¹	80	—
United Provinces— Banda ¹		—	—
Benares	Bridhkal ^{1,2}	77	Little H ₂ S and CO ₂
	Gaibi well ²	77	None
Dehradun	Landour ¹	—	—
	Near Mussorie ²	62.6-69.8	—
	Sahasradhara ²	73.4	—
Garwhal	Gaurikund ¹	Hot 132	Much H ₂ S
	Gaurikund ¹	Cold 72	—
	Palia ¹	Tepid	—
	Tapoban ¹	Very hot	H ₂ S
	Jamnotri	192.6	—
Sind—	Jain Pir ¹	Hot	—
	Laki ¹	102-105	—
	Manga Pir ¹	99-127	—
	Pith or Ghazipur ¹	Very hot	—
	Sehwan ¹	Hot	—
	Wagodur ¹	—	—

My best thanks are due to Dr. M. Sirsi, for reading through criticising the draft of this article.

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DIX—(Contd.)

Radio activity Radons m. Mc/l	Characteristics of water	Therapeutic reputation
—	Slightly alkaline	
—	Sulphurous	Useful in heart and kidney troubles, pains in joints and menstrual disorders.
2.93	—	Cures leprosy, scrofula, skin diseases, rheumatism, and liver troubles. Prevents goitre.
—	Contains 79 to 93 ppm., Iodine	Do.
—	Sulphurous	
—	Saline	
—	Nauseous, metallic flavour	"Medicinal purposes"
—	Sulphurous and bitter	
—	One spring is at boiling point	
—	Deposits sulphur on evaporation	
—	Each spring reckoned a specific against a particular disease	
—	Chalybeate and sulphurous	
—	Sulphurous smell.	
—	Sulphurous	Aperient, prevents scrofula, dropsy and rheumatism.
—	Saline	
—	Slightly saline and sulphurous	
—	Contains H ₂ S	
0.5255	Chalybeate and sulphurous	For debility, rheumatism, skin, liver and spleen diseases.
0.25	—	For skin diseases.
Trace to 0.8	—	
0.273	Chalybeate	
—	Do.	
—	Do.	
—	Do.	
—	Saline and sulphurous	
—	Contains H ₂ S	
—	Sulphurous	

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TRIGLYCERIDES IN NUTRITION AND METABOLISM*

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Dietary fat.—The fats in the food consist mainly of neutral fat together with small quantities of free fatty acids, lecithin and cholesterol esters. The common fatty acids in these neutral fats are oleic acid, stearic acid and palmitic acid. Fats from different sources differ mainly in their fatty acid composition. Mutton fat contain more stearic and less oleic acid than pork fat. Butter fat consists largely of glycerides of palmitic and oleic acids with small quantities of stearic acid and of lower fatty acids, such as butyric and caproic. Mixed glycerides containing a high proportion of unsaturated fatty acids are usually liquid at room temperature. By a process of hydrogenation or hardening these oils (glycerides—liquid at room temperature) can be converted into solid fats. Many commercial fats are partially hydrogenated vegetable oils.

Dietary fat requirement.—The proportion of fat in the diet varies widely from one group of individuals to another depending mainly on availability, cost, established nutritional customs, etc. The recommendation of United States Research Council¹⁵ is—"It is desirable that fat is included in the diet to the extent of at least 20—25% of total calories". The Technical Commission on Nutrition of the League of Nations¹⁵ states, "The minimum quantity of fat or fatty substances which should be present in the diet is not known.....Feasible dietary units might be defined as approximately 80—125 grms. of fat for a varied diet of 3000 calories."

The minimum dietary requirement of fat has not been established. Japanese² reported to consume only 15—20 grms. of fat per day hardly show tiredness or like symptoms ascribed by some to develop on a low intake of fat. The daily intake of fat in the most prosperous regions of Java²² is reported to be less than 10 grms., yet the nutrition of these people is good. Brown,⁴ an adult man, in the study of fat metabolism lived for 6 months on a diet containing 2 grms. of fat per day. No ill effects or untoward manifestations were observed.

Digestion of triglycerides.—Digestion of fat is carried out mainly in the small intestine by the pancreatic lipase. Small amounts of lipase present in gastric juice and succus entericus also helps the process. Some hydrolysis is also brought about by cooking of the fat. The activity of lipase is hampered by the acidity of gastric juice and by the slight acid reaction of the intestinal contents. The enzyme is destroyed by trypsin and this destruction is probably prevented by protein which have a protective action. Bile salts, on the other hand, increase the digestive

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activity of lipase up to fourteenfold.²⁴ Bile salts also help emulsification of fat. This emulsion is further stabilized by mucin. Emulsification increases the surface of fat enormously by breaking it into fine droplets and thus helps lipase to act on it.

Absorption of triglycerides.—The absorption is still a highly controversial subject. Verzar and McDougall²⁵ advocated the lipolytic hypothesis in 1936. According to this, the bile salts unite with fatty acids derived from hydrolysis of fat to form 'bile acid-fatty acid' complex. This is water soluble, diffusible and stable in a slight acid medium. The complex readily passes into the lining cells of the villi where it breaks up into its constituents. The split-off bile acids return to the intestinal lumen to pick up a fresh load of fatty acids and thus continues to move in and out until all the fatty acids are absorbed. The freed fatty acids are resynthesized to triglycerides in the epithelial cells through an intermediate stage of phosphatide formation or phosphorylation. This temporary uptake of inorganic phosphate is controlled by adrenal cortex and catalysed by the enzyme phosphatase present in large amounts in the intestinal mucosa. Fat particles then pass into the blood stream *via* the lacteal lymphatic system.

Frazer⁹ later advocated the partition hypothesis meaning thereby of two routes for fat absorption. The neutral fat is absorbed as such in the form of fine emulsified particles into the intestinal cells and passed on to the lacteals while the soluble 'bile acid-fatty acid complexes' pass directly from the intestine into the portal blood without passing through the lacteals. The important pre-requisite for direct absorption of neutral fat is its thorough emulsion into particles less than 0.5 μ in diameter. The lipase has been said to act on triglycerides in stages splitting off successively each of the three fatty acid molecules. Fat digestion in normal subjects is incomplete and stops before 30% of fatty acids contained in triglycerides are released. Absorption may be influenced by local concentration of electrolytes, and adrenal cortex by regulating the electrolyte balance in the body fluids may have a regulating effect.

Liquid Paraffin—Frazer, Schuleman and Stewart¹¹ have shown that very finely emulsified liquid paraffin in which the particle size is less than 0.5 μ in diameter can be absorbed to the extent of 36% to 43% by the rat intestine. There is, however, no evidence that the fine dispersion of paraffin which Frazer and his colleagues have shown to be necessary for its absorption takes place in the human intestine if it is taken by mouth in the normal way.

Defective fat absorption.—Normal subjects absorb more than 90% of common dietary fats. Defective fat absorption may be due to various causes. Frazer¹⁰ attributes them to be of two types:

(1) Firstly—when the bile or pancreatic secretion is deficient as in chronic pancreatitis or obstructive jaundice, only 10 to 20% of the ingested fat may be absorbed. The faecal fatty acids

resemble the dietary fat in composition. There is no evidence of abnormal gastric secretion or motility. An increase in the fat content of the diet is not associated with corresponding increase in the absolute amount of fat absorbed.

(2) Secondly—in the sprue syndrome (tropical sprue, coeliac disease and nontropical sprue) 50 to 70% of the dietary fat is absorbed. Biliary and pancreatic secretions are normal. The faecal fatty acids are particularly rich in long chain components. Gastric secretion and motility are abnormally low. An increase in the fat content of diet is usually associated with a rise in the absolute amount of fat absorbed. In this type particulate absorption becomes defective. The pH of intestine is less subject to sudden changes. Intestinal bacterial flora changes occur secondarily and this may ultimately precipitate nutritional deficiencies.

Fat storage.—The triglycerides absorbed from the intestine pass into the circulation and cause the post-absorptive lipæmia (fattide). It is readily deposited in fat depots from which it is mobilized when necessary. It may also be directly deposited in the liver and various tissues in the body. Probably because of the fine emulsion in the blood stream, the triglycerides (chylo-microns) can diffuse through the capillary endothelium to reach the tissues.

The depot fat is composed almost wholly of triglycerides. It is derived partly from the fat in the diet and partly from fat synthesized from non-fatty sources in the body. Human fat depot contains 24% of palmitic acid, 8% of stearic acid and 3% of myristic acid as its saturated components and 47% oleic acid, 5% of palmitoleic acid, 10% of acids of linoleic type and 3% of C 20-22 acids as its unsaturated components. If fat of known melting point or known iodine value is ingested, the fat which is deposited in the depot closely resembles it in their characters. Thus a dog may be wrapped in the sheep's skin by dietary means.

It was previously believed that fats of the diets were directly metabolized and that only the excess of the energy requirements was stored in the tissues. Schönheier and Rittenberg¹⁴ by their experiments on mice with the aid of fats labelled with isotopic hydrogen have shown that depot fat is not an inert storage but is constantly involved in metabolic process. Even when fat is in depot at a low level some of it is deposited in the tissues while some of the depot fat is utilized to meet the energy requirements.

Utilization of triglycerides.—The glycerol fraction of fat molecule is oxidised to glucose and used as such. Probably there is preliminary phosphorylation to form phosphoglycerol or phosphoglycism. Fatty acid fractions are broken down to aceto-acetic acid. The steps of oxidation of long chain fatty acids are not established. It is generally agreed that ' β -oxidation' is chiefly the process concerned. Oxidation takes place at the β -position splitting off a

2-carbon fragment and the production of a fatty acid with 2 fewer carbon atoms. The process continues along the chain until the entire fatty acid molecule is broken down to 2-carbon fragments by the removal of 2-carbon atoms at a time. The nature of the 2-carbon fragment is a matter of controversy. It has been suggested to be acetic acid, possibly in an 'active' form. These 2-carbon fragments then condense with one another to form the 4-carbon compound—aceto-acetic acid.

Jowett and Quastel¹⁴ suggested the process of 'multiple alternate oxidation' for fatty acid breakdown. According to this concept the fatty acid is oxidised at every alternate carbon atom to form a succession of ketone groups. The chain is then split at every fourth carbon to give aceto-acetic acid molecules directly.

The long chain fatty acids are oxidised in the liver by an exothermic reaction to aceto-acetic acid. Other ketone bodies such as β -hydroxybutyric acid (its equilibrium reduction product) and acetone (its decarboxylation product) are formed secondarily. The ketone bodies are passed via the hepatic vein into systemic circulation from where they are taken up by muscles, heart and other tissues and there oxidised by an exothermic reaction to yield energy CO_2 and water. The stages concerned in the breakdown of ketone bodies are not known. Some consider that a major metabolic pathway is by way of Krebs tricarboxylic acid cycle, possibly through reversible equilibrium with acetic acid.

Blood ketone level and ketosis.—Aceto-acetic acid is the normal end product of fatty acid oxidation in the liver. It is probably a normal intermediate in the process of fatty acid oxidation in other tissues. The intensity of ketone body formation in the liver is mainly a subject of substrate availability for the local oxygen supplies. In the absence of carbohydrate oxidation which the liver apparently prefers to oxidise as a source of energy, liver fat becomes the principal substrate for the available oxygen resulting in increased ketogenesis. If the peripheral tissues are unable to oxidise the ketone bodies as fast as they are formed, ketosis ensues. Increased ketone level in the blood arises under the following conditions:—

- (1) Diabetes mellitus—where the liver glycogen level falls and the fat level rises resulting in increased oxidation of fatty acids in the liver.
- (2) Starvation—when due to lack of carbohydrates, fats are chiefly used as a source of energy.
- (3) After injection of anterior pituitary extract (ketogenic hormone) when there is increased mobilization of depot fat to the liver with excessive ketogenesis.
- (4) On a diet poor in carbohydrates and very rich in fats. Ketone bodies are also formed in body from other sources.

It has been established that aceto-acetic acid is a normal intermediate in the process of breakdown of certain amino-acids such as leucine and phenylalanins. Pyruvates under certain circumstances have been shown to produce ketone bodies.

Role of fat in diet.—(1) Fats are an essential constituent of all cells in the form of phospholipine and cholesterol esters. These substances are synthesized in the body from ingested neutral fats. They are also present to some extent in the fat of the diet.

(2) Fat serves as a source of energy, 1 grm. of fat liberating 9.3 calories.

(3) Certain highly unsaturated fatty acids which cannot be synthesized in the animal body which have been shown to be necessary for normal growth and tissue metabolism are supplied with the fat in the diet.

(4) The natural fats in the diet serve as a vehicle for fat soluble vitamins.

(5) Fat can be readily stored and thus constitutes the chief energy reserve of the body. The fat deposits of the body can increase almost infinitely, a condition which does not apply to carbohydrates or proteins. Excess of the latter are converted to fat and deposited in fat depots.

(6) Because of the very low specific dynamic action of fat, it raises the metabolism far less than proteins and carbohydrates.

(7) Fats are absorbed slowly from the gut and they have a satiety value in delaying hunger between meals.

(8) Fats as compared to carbohydrates are less subject to cause fermentation in the gut.

(9) Diets containing larger proportion of fats are less bulky since fats have more than double the calorific value of carbohydrates and proteins and fatty foods contain a lesser proportion of water.

(10) Owing to its lubricating effect, diets containing larger proportion of fat are eaten more easily.

Interconvertibility of carbohydrate of fat.—That fats are readily formed from carbohydrates in the body has long been recognised. Conversion of fatty acids into carbohydrates has however always been a matter of controversy. It has been demonstrated⁵ by the use of isotopes that carbon of certain fatty acids are incorporated into glycogen of the animal body. Some believe that gluconeogenesis readily occurs from fatty acids and this is one of the important causes for development of hyperglycemia in diabetes mellitus. It is, however, doubtful whether the altered metabolic state in diabetes causes or facilitates this neoglucogenesis.

Conversion of proteins to fats.—Certain amino-acids like leucine, tyrosine and phenylalanine are oxidised to aceto-acetic acid and this in turn may give rise to synthesis of fatty acids. Since protein

can be converted to glucose and glucose into fat, it is possible that fat may arise from protein in this way. The occurrence of these in normal nutrition is however doubtful. Glucose formed from protein is usually burnt and not stored as glycogen or fat.

Deposition of fat in liver.—On a normal mixed diet the liver contains about 3% of fat. The fat content of liver increases under the following conditions:—

(1) On a diet high in fat, particularly so when it is low in protein or choline.

(2) During increased mobilization of depot fat as in starvation, diabetes mellitus and after injection of pituitary extracts.

(3) In poisoning with some agents, such as phosphorus.

(4) Imbalance in dietary constituents. Animals develop fatty livers¹⁴ in deficiency of essential fatty acids, of pantothenic acid or of riboflavine and also in excesses of thiamin and biotin. The important lipotropic agents which prevent deposition or reduces the amount of fat already deposited in the liver are choline, methionine, lipocic, inositol and tryptophane.

The deposition of fat in the liver is of importance since fatty livers may lead to development of its cirrhosis. The important point arising out of it is how much fat the liver can tolerate and for how long before cirrhosis develops. Glynn and his colleagues¹⁵ have shown that the critical stage is reached when the fat in the liver rises to 15% and that above this level the rate of fibrosis is proportionate to the fat content of the liver.

Essential fatty acids.—Burr and Burr¹⁴ first demonstrated that the body cannot synthesize certain highly unsaturated fatty acids essential for nutrition. Thus rats placed on a diet devoid of fat but otherwise complete, failed to grow and showed some lesions on the skin and tail. The deficiency did not develop when small amounts of highly unsaturated fatty acids like linoleic or linolenic acid were added. These were confirmed by further studies. Arachidonic acid has been found to be more effective than other unsaturated fatty acids in promoting growth.

Nutritive value of different fats.—Works done on this subject have not so far proved that there is any significant nutritional difference between common animal and vegetable fats other than those that can be attributed to be due to their slight differences in digestibility and vitamin contents. There have been numerous controversial observations on the subject. In experiments on man¹⁴ it was shown that hydrogenated vegetable oil was as satisfactorily digested and utilized as was lard and was less liable to cause gastric or intestinal symptoms of an objective nature. Deuel¹⁴ has shown in his experiments on rats by replacement of whole milk powder of Sherman's whole milk powder-ground whole wheat basal diet by

skimmed milk powder and margarine fat that adequate growth and reproduction could be maintained for 13 generations. Deuel and his co-workers⁶ made a series of observations which seem to show that rats grow equally well whether the fat used in the experimental diet is butter, margarine, corn, cottonseed, peanut or soyabean oil. Boer and his co-workers¹, on the other hand, have recently reported from their experiments on rats that vaccinic acid present in summer butter has growth-promoting properties and this is an evidence in favour of superiority of butter fat. Boutwell and his associates³ consistently observed the superiority of butter fat to corn oil in effecting rat growth under certain dietetic conditions. Further researches are necessary on this subject before a more definite conclusion can be reached.

Artificial fats¹⁸ have been produced in Germany at various times since the first World War from acids formed by catalytic oxidation of petroleum. By repeated purification it has been possible to produce tasteless fat which is harmless when consumed in small quantities. A high cost is however involved in this process of production and further studies are needed before they can be recommended for general use in human nutrition.

Dietary fat and vitamin requirements.—Mannering¹⁸ has shown that riboflavine requirement of the rat is considerably increased with fats at a level of 25 and 40 per cent of diet. This may probably be due to altered intestinal bacterial flora with the high fat diet leading to impaired biosynthesis of riboflavine.

The dietary fat is considered to have a sparing action in connection with certain vitamins—such as thiamin, nicotinic acid and adrenin. Salmon¹⁹ has demonstrated that nicotinic acid deficiency develops more readily in rats on a low fat diet and that 30% fat in the diet tends to counteract the deficiency. It has been seen that acrodymia associated with vitamin B₆ deficiency⁷ becomes more marked when fat is omitted from the diet. Certain fatty acids like linoleic acid are specially important in this respect.

There is evidence in support of the view that tricarboxylic acid cycle is a pathway for oxidation of fatty acids as well as carbohydrates. If this is the case, thiamin becomes as important in fat metabolism as in carbohydrate metabolism.

The requirement of choline and other lipotropic agents increases with high fat diets to prevent the development of fatty changes and necrosis of the liver.

Fats in economy of food utilization.—Forbes and his associates⁸ suggest that on a fixed diet containing fat, animals have extra calories for work, storage and growth and these extra calories are not available when fat is replaced by a isocaloric mixture of carbohydrate and protein. As 30% of fat was compared with a 2% fat in the diet, the retention of nitrogen as tissue protein was higher by

more than 10% in the former. Schantz and his co-workers²⁰ have showed that 3 to 4% of fat naturally present in milk is necessary to the animal for complete utilization of lactose or more specially galactose. Geyer and his associates¹² also conclude from their experiments on rats that fats in some may influence galactose utilization.

Dietary fat deficiency.—In young rats, the deficiency of essential fatty acids has been found to cause (as already described) cessation of growth and some skin lesions. Infants were found to develop eczema¹⁵ on a very low fat diet by two different workers. There is, however, no conclusive evidence that unsaturated fatty acids (linoleic, linolenic and arachidonic) are essential for health in man. Brown⁴ in his very low fat diet for 6 months did not show any untoward manifestations. Six months in the life of a man, however, corresponds to a week in rat's life and it is possible if Brown had continued his diet longer, some deficiency manifestations might have been observed.

If the fat content of the diet falls very low, deficient calorie intake may result and this may lead to the development of famine oedema. This is why fat deficiency is considered as one of the causes of famine oedema. Cases of famine oedema have recently been divided into two groups.²¹ In one there is hypoproteinaemia and in the other the protein content of blood is within normal range and in this group there is probably increased re-absorption of water from kidney tubules.

Rancid fat.—When fat is kept for a sufficient length of time in contact with air and moisture, particularly in the presence of light and heat, certain chemical changes take place and the fat becomes rancid. The exact chemical processes concerned in the processes of rancidity are not known. The unsaturated fats, particularly those containing oleic acid become rancid more rapidly than saturated fats. Rancid fats¹⁴ are unpalatable, slightly toxic to some individuals and there is destruction of vitamin A and vitamin E in rancid fats. The process is associated with intense peroxide formation and it is believed⁷ that intermediates of fatty acid peroxidation are the more important agents concerned and not the peroxides themselves in destruction of vitamin A.

Intravenous alimentation of fat¹⁸.—Attempts have been made to prepare suitable fat emulsions that can be administered intravenously. Such emulsions should be stable, compatible with glucose and proteins for simultaneous administration and should not cause reaction in the body. Olive oil emulsified with either diluted plasma protein or a combination of dextran and Soyabean phosphatides is reported to have given promising results in this direction.

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ANTIBIOTICS*

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WITH the advent of antibiotics a whole group of infections came under reasonable control. Of the various antibiotics which have been discovered Penicillin, Streptomycin, Aureomycin and Chloromycetin have established themselves. Tyrothricin is of some value for local application. Others like Terramycin may prove to have a place in clinical medicine. They are of the utmost value in the practice of otolaryngology and the methods for their administration are many and varied. Aerosolization, nasal inhalation and instillation, lozenges, ointments and drops are some of the methods of local administration of these drugs.

These although capable of almost unbelievable good are not without their dangers and they are bringing new problems to the practice of medicine. Many have felt that the range of effectiveness of the antibiotics is so great that much of the burden of diagnosis has been eliminated, that in effect they constitute a cure all. Far from being the case accurate diagnosis remains just as important as ever and sometimes even more so. Every one knows about these antibiotics and most lay persons have the idea that their powers are limitless and that one can cure himself of practically anything. When they are so useful why bother to spend money for medical diagnosis. Since the specialist also prescribes the same one might as well do the same. Unfortunately this is a mistaken view point, because accurate diagnosis is the basis of all sound treatment. Once the diagnosis is made the appropriate drug should be given in adequate dosage and the full course of treatment continued for the necessary period to ensure a cure. Inadequate therapy leads to development of resistant strains of bacteria and the masking of the symptoms. This is dangerous particularly in acute middle ear and mastoid disease as they lead to symptomless complications. So it is better for us to err on the side of giving larger doses than may be deemed necessary rather than run the risk of complications or failure to cure that may follow small doses. Further these are bacteriostatic rather than bactericidal. Therefore these drugs should be administered at frequent intervals and for a period long enough to impair the vitality of the organisms so that their destruction can be completed by the natural defences of the body. To give the patient with ear discharge a few injections or tablets and the patient with tonsillitis a few lozenges is criminal neglect of fundamental therapeutic principle. There are certain principles which should be constantly kept in mind if one wishes to administer these drugs in a rational and scientific manner. The first principle is they should be used against organisms for which they are specific. The vast majority of patients with acute suppurative otitis media,

* Specially contributed to THE ANTISEPTIC.

furunculosis of the external ear, acute sinusitis, tonsillitis etc., will respond promptly and effectively to parenteral use of Penicillin. The isolation and identification of the causative organisms in every case of infection is hardly feasible and practicable in every day practice. When, however, a definite clinical response to the antibiotic is not promptly observed the organisms must be identified and their sensitiveness determined.

The second principle is, to be effective the drug must come in actual contact with the organisms and maintain a sustained contact. The difficulty of applying this principle to the upper air passages is accountable perhaps to the disappointing results observed from the popular methods of topical applications. Indiscriminate use of these drugs in the form of sprays, lozenges etc., in the nose and throat is positively harmful in the absence of infection. The normal flora of the throat may be altered to include harmful organisms. Moreover prolonged administration of the antibiotics may produce resistant organisms which fail to respond to the same antibiotic at some subsequent time when it may be sorely needed.

For many of the lower respiratory tract infections Penicillin aerosol has been very much popularised but the results are not very encouraging. We find that local instillation of Penicillin through the bronchoscope in cases of bronchiectasis and lung abscess is sometimes followed by very marked improvement.

Another principle pertaining to the use of antibiotics is that they are not effective when inflammations have progressed to suppurations, or when used in the treatment of chronic conditions of the ear, nose and throat. They do not permit the violations of the principles of surgery. Operative measures are imperative if one hopes to obtain a cure although an antibiotic may be an exceedingly important supportive measure both before and after the operation.

In otolaryngological practice Streptomycin has a great value in the treatment of tuberculous mucous membrane lesions. In addition we have used Streptomycin in rhinoscleroma and ozena with very gratifying results. The toxic effects of Streptomycin have themselves been turned to good account in the treatment of Meniere's disease. Four grams daily are given for about a week in an attempt to perform a chemical destruction of the labyrinth. The labyrinth is destroyed and the hearing is but little affected. This is in contrast to the attempted surgical methods of destroying the labyrinth which produces deafness as well.

Aureomycin and Chloromycetin have a wider range of activity than any other antibiotics known and bacteria seldom acquire any important degree of resistance to them and they do not give rise to any serious toxic effects. However, unless the organisms are resistant, Penicillin is still preferred on the score of economy and also because the former objection to Penicillin that frequent injections are needed has largely been overcome by the introduction of slowly absorbed preparations.

In conclusion I should like to particularly emphasize the following factors in the use of antibiotics :

- (1) Accurate diagnosis is the basis of all sound treatment.
- (2) When antibiotics are indicated an adequate dosage should always be given. Inadequate therapy leads to development of resistant strains of bacteria and the making of symptoms. To avoid this it is better to err on the side of giving large doses than may be deemed necessary rather than run the risk of complications.
- (3) They do not permit the violation of sound principles of surgery.
- (4) Indiscriminate use of these in the nose and throat in the form of sprays, lozenges etc., is positively harmful in the absence of infection as the bacterial flora of the throat may be altered to include harmful organisms.

Combined Streptomycin and Paraaminosalicylic Acid

A comparative study of four dosage schedules in 283 patients was carried out at the United States Army Tuberculosis Centre, Fitzsimons Army Hospital, during the past four years. In each schedule the patients were treated for 120 days. The four groups consisted of 66 patients who received streptomycin, 1 or 2 gm. daily; 25 who received paraaminosalicylic acid, 12 gm. daily; 97 who received streptomycin intermittently, 1 or 2 gm. every third day, and 95 who were treated on a combined regimen of streptomycin, 1 to 2 gm. every third day, concomitantly with paraaminosalicylic acid, 12 gm. daily. The patients on each regimen were similar with respect to age, sex, race, and duration, extent and type of disease. All patients had moderately or far advanced pulmonary tuberculosis and had received no prior antituberculous drug therapy. Clinical, roentgenographic, bacteriologic, and drug toxicity factors were evaluated after 120 days of treatment. Clinical response, in terms of reduction of fever, reduction of sputum volume, and weight gain, was equivalent on all four regimens. Of patients with roentgenographic evidence of cavitation when therapy started, the cavities disappeared in not more than 20.5% after 120 days of therapy. The best results and the highest incidence of sputum conversion were obtained with the combined intermittent regimen (streptomycin every third day, paraaminosalicylic acid daily). No instances of bacterial resistance occurred with this regimen, compared with 75.9% after daily streptomycin, 33.3% after daily paraaminosalicylic acid and 33.3% after intermittent streptomycin regimens. The high incidence of toxic reactions (57.5%) that resulted when streptomycin was given daily decreased to 5% when the drug was given every third day for a similar period. The incidence of toxicity when paraaminosalicylic acid was given daily was also 5%. The higher incidence of toxic reactions (13.1%) that resulted when the two drugs were given together was not sufficient reason to discontinue the regimen except in four instances. Results were evaluated 60 days after the 120 day courses of therapy, because in this period it was frequently necessary to supplement the prior treatment with treatment (drug therapy) or operative procedures. Clinical relapse was approximately equal (15.1 to 22.2%) on each of the regimens. Roentgenographic relapse varied from 0% in the daily paraaminosalicylic acid group to 14.8% in the daily streptomycin group. Bacteriologic relapse ranged from 5.5% in the daily paraaminosalicylic acid series to 31.2% in the combined intermittent regimen. A loss of bacterial resistance to one or the other of the drugs was observed; this was pronounced in the daily paraaminosalicylic acid regimen and indicates that resistance may be less permanent to this agent than to streptomycin. The regimen of choice for periods up to four months when specific drug therapy is indicated for the treatment of nonmiliary pulmonary tuberculosis is a combined intermittent regimen of streptomycin administered every third day and paraaminosalicylic acid daily.—J.A.M.A.

(b) The pupil should start at the top of the chart and should read down from left to right.

(c) The degree of acuteness of vision is determined by the smallest letters that can be read by each eye separately at 20 feet distance from the chart. To illustrate, if with the right eye (the other covered) all the letters in line 7 can be read without mistake, the right eye has normal vision i.e. $\frac{6}{6}$. If the left eye is similarly tested (the right eye covered) and found to see not better than the letter on line No. 5, then the left eye has $\frac{6}{12}$ vision as indicated by the figures above that line of letters. It is recorded as follows:—R.E.V. = $\frac{6}{6}$. L.E.V. = $\frac{6}{12}$.

Types of acuteness of vision.—TYPE A:—A record of $\frac{6}{6}$ in each eye separately and not accompanied by any symptoms of eye strain is normal vision. It is to be recorded as follows:—

R. E. V. = $\frac{6}{6}$. L. E. V. = $\frac{6}{6}$.

TYPE B.—A record of $\frac{6}{6}$ does not indicate normal vision if accompanied by symptoms of eye strain. The evidence of eye strain is designated by the symbol "S" and will be recorded as follows:—

R. E. V. = $\frac{6}{6}$ (S). L. E. V. = $\frac{6}{6}$ (S).

This indicates normal acuity of vision plus eye strain and will need a thorough examination and treatment.

TYPE C:—A record of less than $\frac{6}{6}$ in one or both the eyes indicated defective vision. It is to be recorded as follows:—

$\frac{6}{60}$, $\frac{6}{36}$, $\frac{6}{24}$, $\frac{6}{18}$, $\frac{6}{12}$, $\frac{6}{9}$.

Recording of results of observations.—Perfect records are important and helpful. It is necessary that records of all tests of vision etc., be preserved so that as the child advances from class to class, the teacher and the school health officer will have record of the child's previous examinations.

Record each child's acuity of vision in the cards and also note the presence of eye strain such as cross-eyes, headaches, frowning, sensitiveness to light, weariness after studies or red congested eyes.

Notification and follow-up.—In cases where defective vision, muscle defect, or eye diseases is discovered, it is absolutely essential to have proper follow-up of the cases. Parents should be notified about the result of the eye test and requested to put their children under proper treatment. Children for whom spectacles or eye treatments are advised also require follow-up to make sure that such spectacles or treatment are obtained. To accomplish this, a list of such pupils should be made for whom the eye surgeon has made definite recommendations, in order to check from time to time whether the advice has been carried out.

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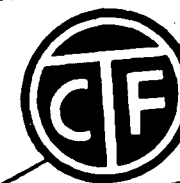
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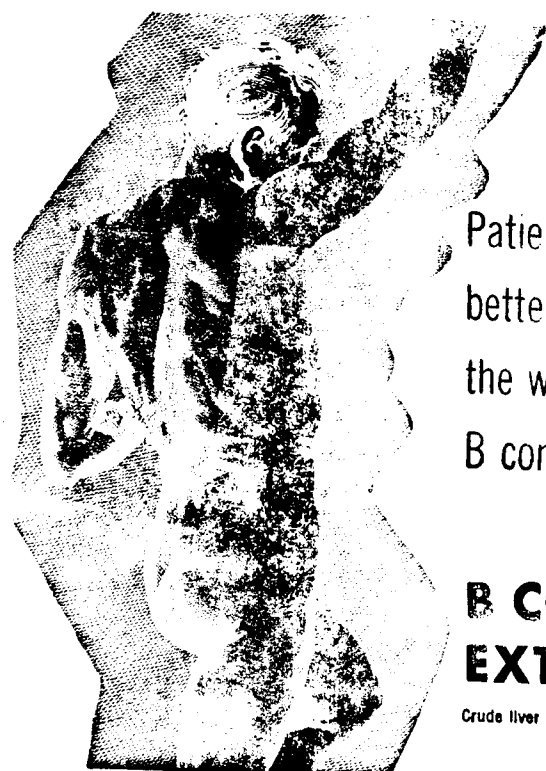
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Class.....Section.....
Date of examination.....No. of students examined.....

Age of students	Number	Type A	Type B	Type C	Any eye disease
5 to 10 years					
11 to 15 "					
16 to 20 "					
21 to 25 "					
Above 25 years					

Signature of Examiner.

A NEW APPROACH TO PATHOLOGICAL PROCESSES AND THERAPEUTIC POSSIBILITIES*

A. V. S. SARMA, M.B., B.S., D.C.H. (Eng.), F.D.S. (London),
Honorary Physician, Government Royapettah Hospital, Madras, India

"Ah, but a man's reach should exceed his grasp,
Or what's heaven for ?.....". —Robert Browning.

Introduction.—The writer expressed thus in 1938 : "A venture-some statement will be that specialised derivatives from one germinal layer are concerned with the maintenance of normal health and the rearing up of natural immunity of the other tissues and organs derived from the same germinal layer," and since then set his thinking on the ideas more fully expressed below in this communication.

The human body is developed from the zygote endowed with the potentialities of its parents and the capacity of producing a new member of the species. The zygote develops into the morula which reveals the outer trophoblast, and the inner cell mass. The ectoderm, mesoderm, and endoderm recognisable in the inner cell mass give rise to the organs and tissues of the entire system constituting the human body.

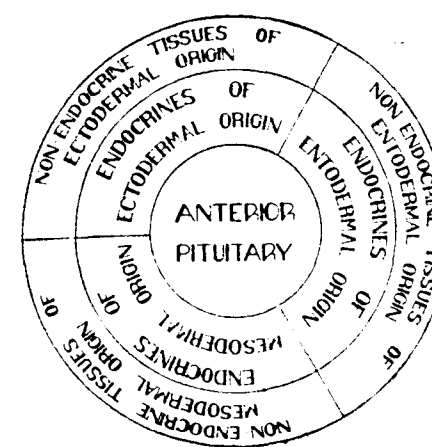
"A thing of beauty is a joy for ever ;
Its loveliness increases : it will never
Pass into nothingness ;.....". —John Keats.

And even so a thing of originality is an attainment for ever ; it grows from strength to strength ; and it shall live for ever inspite of storms of criticisms, which will only season the inherent texture. With the above inspiration, courage and above all conviction, the writer sets forth two hypotheses.

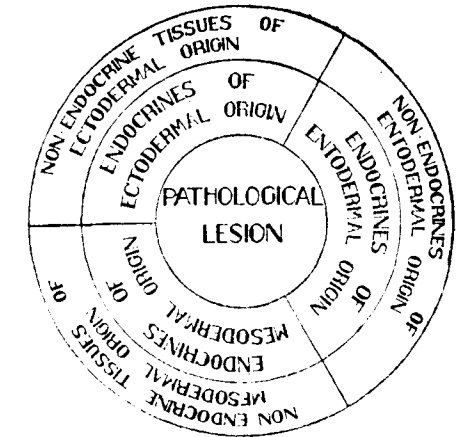
Hypothesis "A"

The writer offers the following hypothesis as the important factor governing the pathological processes in the body. In any naturally occurring disease, degeneration or defect, all derivatives of any one embryonic layer are vulnerable to morbidity, while the maximum manifestations may be only in one or more of them. Therefore pathological changes can be predicted in disease or degeneration, or congenital defect, while we are able to perceive only the field of maximum incidence of damage or injury. Therefore pathology demands to be appreciated as of ectodermal, mesodermal, and entodermal structures. The writer ventures and desires to allocate to this hypothesis a status analogous to the periodic classification in chemistry. (*Diagram to explain thesis "A" vide page 917*).

* Specially contributed to THE ANTISEPTIC.



HYPOTHESIS "B"
Diagrammatic representation.



HYPOTHESIS "A"
Diagrammatic representation.

Hypothesis "B"

That one or more of the endocrine tissues (master tissues) developed from ectoderm, are endowed with the functions of governing and protecting, in health and disease, the other tissues and organs (subordinate and target tissues) derived from ectoderm, their common parent, is also another hypothesis released in this communication. Analogous functions are attributed to the endocrine tissues derived from mesoderm and to those from entoderm. (*Diagram to explain thesis "B"*).

Hypothesis "A"—Elaboration

The following table (*vide page 919*) explains how pathology is dominant in derivatives of one or other germinal layer.

Table to explain Thesis "A"

The thesis of Selye and elaboration by Boland regarding the diseases of adaptation have evoked in the writer keen interest and the present communication by the writer is a support for the great work at least as far as importance of the adrenal cortex is concerned.

Hypothesis "B"—Elaboration

The endocrine glands are the pituitary, adrenals, thyroid, and parathyroids, while the liver, pancreas, and the intestinal mucosa and the gonads own an internal and external secretion. The pineal and the thymus appear to exert an influence on the racial development.

According to the writer, an entodermal contribution to the anterior pituitary is possible from the nearest entodermal cells lining the primitive foregut (*vide diagram*) and a mesodermal contribution from the adjacent notocord.

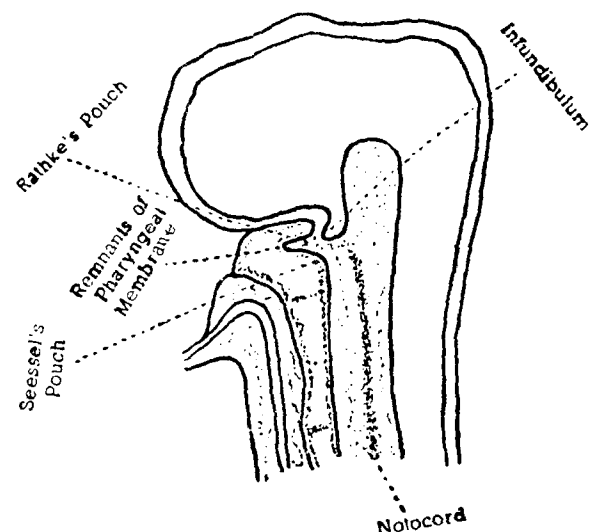


DIAGRAM TO SHOW SECOND STAGE IN THE DEVELOPMENT OF THE PITUITARY.

[AFTER MIRALKOVICS AND HERRING]

From: "The Pituitary"—By W. Bell. (1919).

asthma; symptomatic relief in tuberculous arthritis; subjective improvement in pulmonary tuberculosis; and considerable relief in gouty arthritis and osteoarthritis. Inflammatory diseases of the eye like subacute uveitis and iridocyclitis are also benefited.

Recent chemotherapy with Sulpha drugs and antibiotics has revealed resistant strains of bacteria and the writer suggests that effective and useful support.

The writer stresses that the human body be viewed more to achieve fortification of its soil both in the prevention and in the treatment of disease that gets sown in the soil of the tissues. Many degrees of functional or organic derangement of one or more of the master tissues (endocrine elements) of the body, and in future therapy would include hormones in many acute and chronic diseases. The fertile support to the soil is in the anterior pituitary and the adrenal cortex.

"Be through my lips to unawakened earth
The trampet of a prophecy !....."

—P. B. Shelley.

Table Elaborating Hypothesis "A"

No.	Disease	Lesions in ectodermal derivatives	Lesions in mesodermal derivatives	Lesions in entodermal derivatives	Writer's anticipation
1	Vitamin A deficiency.	Night blindness, dermatitis, xerophthalmia, and atrophy of enamel of teeth.	...	...	...
2	Vitamin B ₁ deficiency.	Microscopic nerve lesions in vagus, phrenic and cranial, and peripheral nerves.	...	...	...
3	Vitamin C deficiency.	...	Failure of malnutrition of mesodermal cells, and impaired immunological and detoxicating functions.	...	Adrenocortical failure.
4	Vitamin D deficiency.	...	Rickets, osteomalacia, osteoporosis, dental caries.	...	...
5	Vitamin E deficiency.	...	Muscular and testicular atrophy.	...	...
6	Toxins of tetanus and diphtheria.	Fix to nerves.	...	...	...
7	Sarcomata	...	Malignancy.	...	...
8	Carcinomata	...	Malignancy.	...	...
9	Septicæmias	...	Splenomegaly; inflammations in serous membranes, joints, kidneys, bones and endocardium.	Malignancy.	Adrenocortical damage.
10	Infective granulomata.	...	Granulomatous lesions in the fixed connective tissues.	...	Do.
11	Protozoan illnesses.	...	Lesions in reticuloendothelial system.	...	Do.
12	Spirochætal illnesses.	...	Lesions in the connective tissues, and granulomatous with lymphadenitis.	...	Do.
13	Rickettsial, and viruses of glandular fever, acute infections, lymphocytosis and bartonellosis.	...	Lesions as in septicæmic illnesses.	...	Do.
14	Lymphogranuloma venereum.	...	Lymphatics.	...	...
15	Infective hepatitis, yellow fever, influenza, cold, psittacosis, pneumonia.	...	...	Liver or lungs	...
16	Yellow fever	Neurotropic.	...	...	...

Table Elaborating Hypothesis "A"—(Contd.)

No.	Disease	Lesions in ectodermal derivatives	Lesions in mesodermal derivatives	Lesions in entodermal derivatives	Writer's anticipations
17	Viruses of variola, vaccinia, chicken-pox, Herpes simplex and zoster, morbilli, mumps, lymphocytic choriomeningitis, poliomyelitis, lethargica, and rabies. Molluscum contagiosum.	Neurotrophic First six or also Dermatotropic.	...	...	...
18	Rheumatic fever.	Dermatotropic.	Damage to interstitial and supporting tissues—collagen and elastica—all the derivatives of mesoderm are susceptible to damage.	...	Adrenal cortical damage. Involve-ment of pleura, peritoneum hepatic vasculature, intestinal musculature, kidneys, and gonads to be recognized.
19	Nephritis.	...	Diffuse capillaritis typified in kidneys, and involvement of serous membranes.	...	Lesion in adrenal cortex. Gonadal damage. Anemia in nephritis and rheumatic diseases seem to be due to bone-marrow damage.
20	Blood dyscrasias.	...	Manifestations in pernicious anemia, purpura, hæmophilia, and leucoses are in bones and bone marrow.	...	...
21	Rheumatoid arthritis, and Still's disease.	...	Allergic etiology. Benefit from cortisone therapy.	...	Lesion in adrenal cortex.
22	Gout.	...	Cardio-nephritic involvement.	...	Do.
23	Congenital heart disease.	...	...	...	Do.
24	Epiloia.	Tuberose sclerosis of brain and adenoma sebaceum.	...	...	...

Table Elaborating Hypothesis "A"—(Contd.)

No.	Disease	Lesions in ectodermal derivatives	Lesions in mesodermal derivatives	Lesions in entodermal derivatives	Writer's anticipations
25	Diabetes mellitus.	...	...	Hepatitis and pulmonary catarrh or suppuration are common.	...
26	Hepato-lenticular degeneration. Hepatorenal syndrome. Pick's disease.	...	...	...	Allergic basis. Adrenocortical lesion.
27	Renal rickets.	...	Renal and skeletal damage.	...	...
28	Fibrocystic disease of pancreas.	...	...	Associated lesions are present in the lungs, bronchi, gall bladder and bowel. (Farber).	Whenever a congenital malformation is seen in any organ search of associated deformities in the other derivatives of the parateral germinal layer.
29	Polycystic kidneys.	...	...	...	Ulcers in respiratory and biliary passages. Damage in lining membranes of trachea, bronchi and lungs. Liver and pancreas.
30	Peptic ulcers.	...	...	...	Allergic basis and adrenocortical damage. Do.
31	Idiopathic steatorrhea of adults, coeliac disease and sprue.	...	...	...	Do.
32	Hepatic cirrhosis.	...	...	...	...
33	Asthma, vertigo, sleeplessness, and schizophrenia syndrome. (Elaborated by the writer).	...	...	...	...
34	Allergic Pachymeningitis, pericarditis, pleuritis, peritonitis, orchitis, and oophoritis.	...	...	...	...
35	Hæmorrhagic small pox; severe enteric infections, pneumonias, diphtheria, blood diseases.	...	...	...	A condition like water-house-Friedrichsen syndrome possible.

Table Elaborating Hypothesis "B"—The writer's anticipations
in endocrine therapy

Ectodermal endocrine derivatives	Diseases bene- fited by ectoder- mal endocrine derivatives	Mesoder- mal endo- crine deri- vatives	Diseases benefited by mesodermal endocrine deri- vatives	Entoder- mal endo- crine deri- vatives	Diseases benefited by entodermal endocrine derivatives
Pituitary and chro- maffin tis- sues.	Virus diseases like variola, encephalitis complicating viral in- fections. Vari- cella. Herpes simplex and zos- ter. Morbilli. Ru- bella. Epidemic parotitis. Lym- phocytic menin- gitis. Polio. En- cephalitis lethar- gica. Yellow fever. Rabies. Tetanus.	Adrenal cor- tex and gonadal hormones.	Septicaemic illnes- ses. Infective gran- ulomata. Proto- zoal and spirochae- tal illnesses. Ric- kettsial illnesses. Lymphogranuloma venereum. Rheu- matic diseases. Al- lergic disorders. Cardiac and other muscular degenera- tions. Nephritis. Blood diseases. Muscular dystro- phies.	Insulin. Thyroid. Parathy- roids.	Infections, inflamma- tions and degenera- tions of respiratory and diges- tive lining membra- nes. Pep- tic ulcers. Hepatitis. Pancrea- titis. Cho- lecystitis. Prostatitis.

The writer is indebted to Dr. P. R. Kalyanasundaram, M.B., B.S., Superintendent, Government Royapettah Hospital, Madras, for all the encouragement received.

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Lipoid Pneumonia Caused by Mineral Oil Laxatives

Baron presents histories of six patients in whom necropsy revealed lipoid pneumonia. He classifies lipoid pneumonia as a man-made disease. Oil in nose drops, in vitamin preparations, or in a mineral oil laxative can cause this condition. Cases of lipoid pneumonia in children are understandable in view of the fact that the administration of oily vitamin preparations is frequently accompanied by strugglings and possible aspiration. Most fish oils and free fatty acids are irritating to the lung tissues. Mineral oil is not assimilable; being a saturated hydrocarbon, it cannot be digested in the body. So it remains in the lung indefinitely; only small amounts appear in the sputum. Anatomic defects in the mouth, tongue, larynx or oesophagus, swallowing difficulties, forced feeds, all these predispose to the aspiration of oil. When mineral oil reaches the dependent portions of the lungs, it first remains free in the alveoli but is later picked up in droplets by the macrophages. Some of the mineral oil can be disposed of in the sputum but the bulk remains in the lung indefinitely and causes the development of fibrous tissue. The lesion thus produced can be detected by the X-rays. The lower lobes, particularly the right, are most likely to be involved. The abnormal lung is a fertile soil for repeated attacks of bronchopneumonia which may be responsible for the death of the patient. All the six cases reported on by Baron, had received mineral oil as a laxative, though death had been caused by other conditions. Since oil cannot be removed from the lungs, prevention is the only treatment. Laxatives containing mineral oil should not be used nor should oily nose drops be instilled in the respiratory tract.—(Virginia Medical Monthly, 77, 1950, pp. 445-451).

Cases and Comments

OBSERVATIONS ON
PSEUDO - HYPERTROPHIC MYOPATHY

A. V. S. SARMA, M.B., B.S., D.C.H. (Eng.), F.D.S. (London),
Honorary Physician, Government Royapettah Hospital, Madras, India.

PSEUDO-HYPERTROPHIC myopathy is characterized by progressive weakness and wasting of muscles, though with an initial increase in the size of some muscles. No primary changes are seen in the nervous system. The condition is attributed to poor muscular fixation of creatine and by Boyd to pituitary disturbance.

AETIOLOGY.—Victims are children usually with preponderance in boys and said to be escaped by women who transmit the disease to their male children.

Morbid anatomy.—The muscle fibres increase in size in the "Pseudohypertrophy" with increase in fibro-fatty tissue. In the atrophied muscle fibres, nuclei are more in number.

SYMPTOMS.—The patients are noticed to exhibit clumsy progression. The calf muscles and infrapinnati appear hypertrophied as also frequently quadriceps extensor, glutei and triceps. Latissimus dorsi and lower pectoralis major are always atrophied and commonly also erector spinae and trunk muscles, flexors of knee, peronei, and biceps. Facial, fore arm and hand muscles escape.

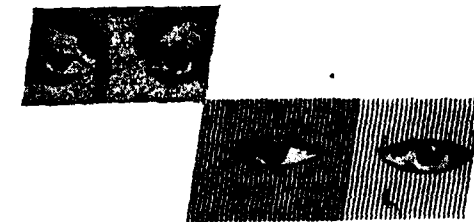


Vaidyalingam, Male, 20.
Pseudo-hypertrophic Muscular Myopathy.



Rajamma, Female, 28.
Pseudo-hypertrophic Muscular Myopathy.

[924]



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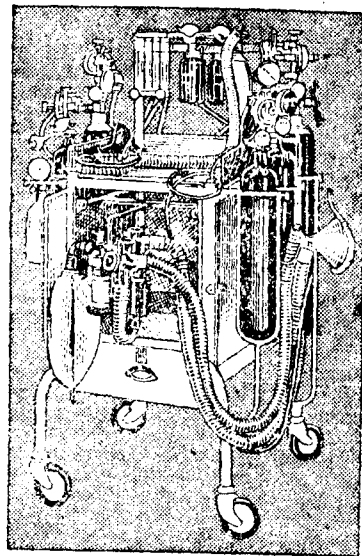
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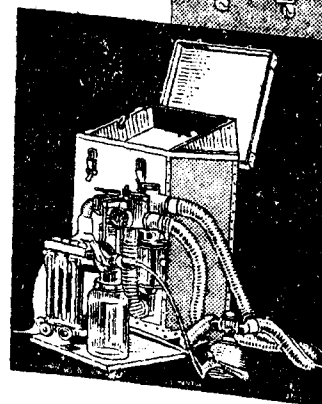
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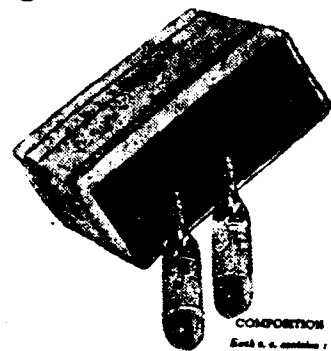
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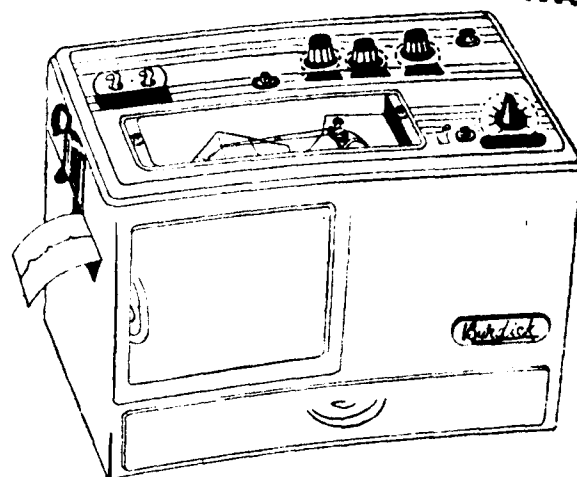
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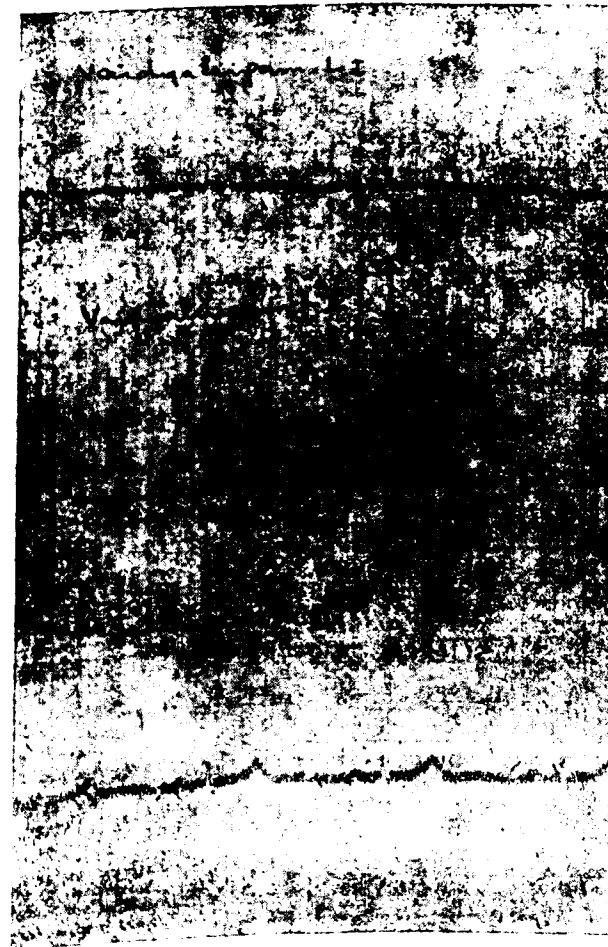
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The patient has generally lordosis (Vaidyalingam and Rajamma—clinical photographs, vide page 924) and protuberant abdomen. Waddling gait and Gowers' figures are demonstrable. No impairment of sphincters is seen. The mind is depressed in the patients under study as they are grown up and have realised their inferiority of muscular build.

ELECTROCARDIOGRAM



COURSE.—All muscles atrophy progressively with resulting lateral spinal curvature, talipes, etc. General health is unaffected and death is usually by pubertal age from weakness or pulmonary involvement.

TREATMENT.—Keeping the patients active as long as possible and trial with Glycine and Vitamin E is advised. The female patient under observation is under Vitamin E therapy.

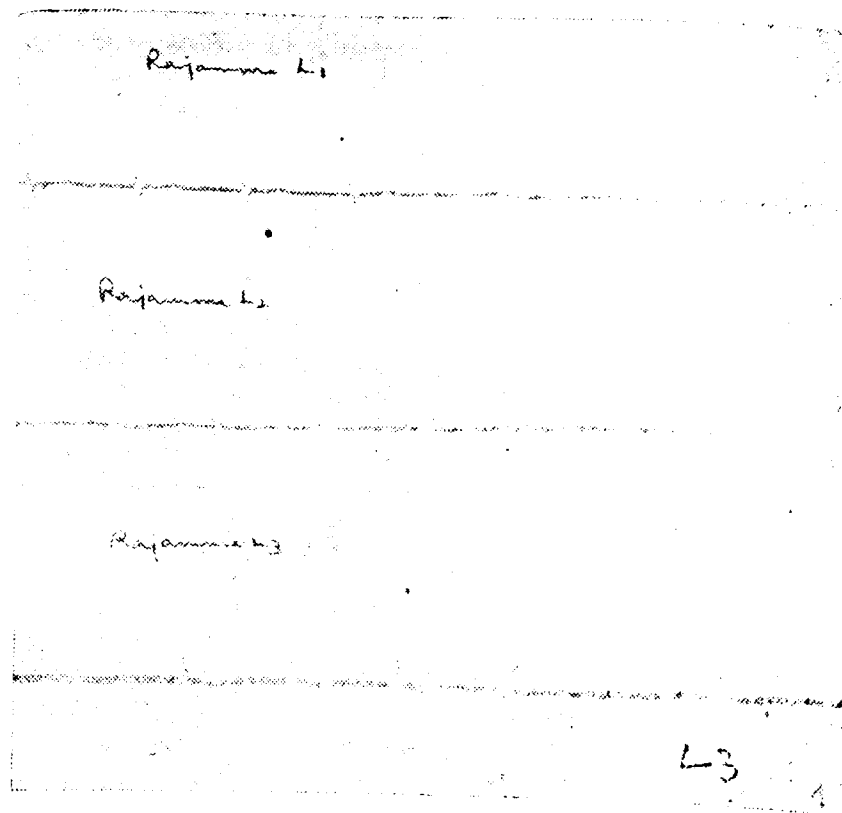
The writer has records below of two adults exhibiting pseudo-hypertrophic myopathy; one male and the other a female.

1. Vaidyalingam, male, 20 years

old. Admitted on 2-3-'51 for pain in lower limbs of 2 years' duration. Clinically the patient is of thin build. Mentally depressed. Gait waddling and with lordosis. Calf muscles and infraspinatii are large. Abdomen: Liver and spleen not enlarged. Heart: nil particular. X-rays chest: A.P. view (picture) shows hilar shadows marked with basal streakings. X-rays spine (lower dorsal and lumbar): Nil particular. E. C. G. tracings: nil particular except for splitting of R in all leads. Blood Kahn test negative. Blood creatinine 1.1 mgm. %; Uric acid 4.4 mgm. %. Urine: nil particular.

2. Rajamma, female, 28 years, married, no children. Admitted on 4-3-'51 for inability to walk (duration not clear) for about some months. Clinically the patient is obese. Mentally anxious and depressed. Gait waddling and with lordosis. Calf muscles very large. Gait waddling, and lordosis present. Heart : nil particular. B.P. 90/70 mm of Hg. Lungs : nil particular. Chest

ELECTROCARDIOGRAM



X-rays A-P view: Hilar shadows marked with excessive basal mottlings. Right cupola of diaphragm irregular. E.C.G. tracing: P is absent in all leads as also T in leads 1 and 2. R is split. T is negative in lead 3 (not significant). Blood Kahn test is negative. Blood creatinine 0.9 mgm%; Uric acid 2.7 mgm%. Urine: nil particular. B.M.R. + 10%.

Comment.—The two patients under study are adults, one of either sex. Radiological studies of the chest show dense hilar shadows and basal markings which may have a bearing in this condition as deaths are frequently from pulmonary infections.

Electrocardiographic tracings of one patient (Rajamma) have shown absence of P in all leads and T in leads 1 and 2. R is split. Do these indicate myocardial damage or intoxication?

The pseudohypertrophic myopathy is classically and clinically a manifestation of skeletal muscles (striped). Is it possible that the myocardium (striped syncytium) also shares a silent fibro-fatty change leading to enfeebled heart and consequential death?

Summary.—Pseudo-hypertrophic myopathy is recorded in an adult female. A possible damage of the lungs and heart muscle, which may be silent, is also suggested as part of the pathology in this condition.

The writer is indebted to Dr. P. R. Kalyanasundaram, M.B., B.S., Superintendent, Government Royapettah Hospital, Madras, for all the encouragement received; and The Director, Government X-Ray Department, General Hospital, Madras, for the co-operation on the electrocardiographic side.

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CHLOROMYCETIN IN CHOLERA

J. KRISHNA, L.T.M.,
Dharmavaram, (Anantapur Dt.).

NEXT to small-pox, cholera comes in its dreadfulness and the observer will be annoyed with horror at the very sight of the patient. Every year this epidemic is taking away many lives due to lack of proper medical aid and specific medicines. Except the usual drugs the effect of which is much doubtful and the salines the purpose of which is for a quite different function, there is no seasonal drug mentioned to arrest the disease. Specific Ayurvedic medicines had given better results than what are told in the lines of the other systems. This epidemic has taken an annual roll in our town and has become a nuisance. For such a troubling disease as cholera anybody would wish to possess a drug of quicker action just like that of the above drug in cases of typhoid. So this prompted me to use the same one in this type of gastro-enteritis just to try its effect. Another thing is its use is quite harmless though it might prove ineffective. In the same season during last year I could use this drug in one case only and to my amazement I saw a dramatic improvement in diarrhoea and vomiting, the two main dreadful symptoms after the fourth dose was given in nine hours within which time six capsules were consumed. The drug was continued in reduced doses till the patient recovered.

I had an idea to try this drug in some more cases and find out whether it is worth using in cholera but as the epidemic was brought round there was no chance for me then. Neither I could assess its value with this single result. Nothing is told of its action on cholera in man. It was found to be effective in the treatment of experimental cholera in mice. Anyhow this single experience gave me full

satisfaction that this drug could be tried in this dreadful disease with some good result.

Just during last month our town became the victim of this epidemic once again. Nearly about sixty cases were recorded out of which nineteen or twenty died. The virulence of the disease was so severe that death occurred within twenty-four hours in most of the cases that died. Nearly thirty persons were treated in the isolation shed. Thanks to the sincere work of Dr. R. N. Sharma and that of Dr. Shrimathi Sharma who attended on those cases day and night without rest, all have been reported as completely recovered. Out of these sixty cases only seven cases were treated with Chloromycetin as all the patients were very poor to purchase this costly drug. For two cases this drug was given freely by a philanthropic gentleman and by the local Service Guild.

All the cases were very bad to look at. In six of the cases the drug was used in very serious stages of collapse. Three cases were treated with this drug in their houses. Five cases were treated with this in the isolation shed when the usual treatments were found to be of no effect. My observations depended on the symptomatic improvement as laboratory facilities were not available at this place. The following are the cases :

CASE I.—Sixteen years boy, duration of the attack—fourteen hours. Suppression of urine had set in three hours after the onset of the attack. The boy was in a serious algid stage, with profuse purgings and vomitings. No medicine was given till then.

After giving him first a little quantity of brandy with soda water one capsule was administered. An hour after this another capsule was given. Between the two he had three motions and one vomiting. After the second dose he had only one motion and was complaining of vomiting sensation but never vomited. Thence onwards three hours once one capsule was given. Totally he was given six capsules only. In between, small quantities of brandy with soda water and glucose were being given. After the third dose he picked up warmth and pulse was felt at the wrist. He passed small quantity of highly coloured urine. Twelve hours after the first dose he had a motion of greenish mucus-mixed stools. He recovered completely.

CASE II.—A male of forty years, with a duration of eight hours. He had number of purgings and vomitings which continued with the same severity and complained of abdominal pain and discomfort. He was not medically attended on till then. There was suppression of urine and he was very cold.

First dose of two capsules was given following some quantity of brandy with fresh lime-juice cordial. Within two hours he had three motions and three vomitings. At the second hour he was given another two capsules. After this he had three or four times vomitings and purgings. Then there was complete cessation of both

the symptoms. He was advised to continue the drug at the rate of two capsules three hourly. After the fourth dose he had slight rise in temperature. The drug was continued upto twelve capsules. The duration of fever was only of a few hours. He easily recovered.

CASE III.—A female, aged eighteen, complained that she had dozen times purgings and six or seven times vomitings within four hours. She was very cold and profusely sweating and the pulse was very thready. There was suppression of urine also.

After the first dose of two capsules she had three or four times loose motions and once vomiting of small quantities of fluid. Thence both the symptoms disappeared. The drug was continued one capsule three hourly upto eight capsules. She recovered very easily.

The above three cases were treated in their houses as the isolation shed was not got ready by that time. In the first two cases there was much dehydration but no saline was given. Within two or three doses of this drug a good turn in the condition of the patient was noticed. I was much influenced by the results of this drug and wanted to try in some more cases to have some more evidence. Along with this only alkaline mixtures were administered.

In the isolation shed nearly thirty cases were admitted and in five cases this was tried with very good results. Here the treatment consisted of Sulphaguanidine and salines to alleviate the symptoms of dehydration. With this treatment an average recovery from the disease was noticed after four or five days. There was gradual reduction of the symptoms day by day. Many of the patients placed on this treatment were exhibiting the continued state of collapse for very long periods inspite of prompt attention and good number of saline injections of maximum doses. Salines were given twice or thrice daily and in some cases it was continued for three to four days. The recovery was very slow. With this treatment in one or two patients complete cessation of choleraic diarrhoea and vomiting was effected after seven days. In many of the cases good lot of cardiac tonics were given along with the salines to keep up the heart. Fortunately all the cases treated in this shed recovered. In one case the heart was affected and he too recovered from the complication after two weeks. The following five cases were treated with Chloromycetin :

CASE IV.—A girl of eight years with a duration of the attack—20 hours. She was vomiting and purging every ten minutes. State of collapse was setting in by the time she was brought to the shed. Immediately she was given saline subcutaneously and was placed on Sulfaguanidine. After six hours she was once more given saline intravenously to combat the impending collapse. Still vomiting and diarrhoea continued without rest. The patient was groaning for relief.

After eight hours' treatment with Sulfa drug, but with no improvement in the condition, she was changed to Chloromycetin. After the first dose of one capsule she had vomitings and purgings only twice. One more capsule was given after an hour and since then both vomiting and diarrhoea stopped completely. Really it was a dramatic result. She passed urine after an hour. She was found to be lively after some time. The drug was continued upto eight capsules. After twenty-four hours she passed solid coloured stools.

CASE V.—Female of forty years with a duration of the attack 15 hours. The patient was continuously in algid state. She was much sunken. For about 10 hours she was placed on Sulfaguanidine and she was given thrice full doses of intravenous saline combined with Coramine. The condition was found to be worsening. Then Chloromycetin was started with one capsule an hour for three doses. After the third dose there was much reduction in the quantities of fluids passed out. The frequency was also bettered. From the fourth dose one capsule every two hours was given. After the fifth dose there was marked improvement in the condition and there was complete cessation of vomiting but she had two or three motions, and then afterwards even that also was absent. Six hours afterwards she passed semi-solid coloured stools and also good quantity of urine. This result was affected by only six capsules. The drug was stopped as it was not available. But she began to recover slowly and never showed any recurrence which I was afraid of. This is a case where we had no hopes.

CASE VI.—A girl of sixteen, four or five hours after the onset of the attack was admitted into the shed and for about eight hours she was placed on the usual treatment and full doses of saline was given twice within that time. There was no improvement in her condition. Then she was placed on Chloromycetin in the same way as the above patient. With six capsules cholera type of motions stopped. Then onwards the dose was changed to one capsule every three hours. After this change she had three or four loose coloured motions. After twelve hours it was noticed that there was complete relief from every symptom of the disease. She easily recovered afterwards.

CASE VII.—A male of forty years. Within the first half an hour he had two motions and two vomitings. He had temperature also. He complained that he had a kind of abdominal discomfort and headache during the previous night. Within an hour he had four or five times purgings and vomitings and the last one was of typical choleraic type. The temperature was 102°F. For about six hours he was given heavy doses of Sulfaguanidine with no marked effect. Afterwards Chloromycetin was given one capsule every two hours for the first two doses. After the second dose the frequency of vomiting and diarrhoea was found much improved. The dose was continued three hours once. General condition of the patient

was much improved. After the fourth dose temperature was found to be normal. Totally six capsules were given.

CASE VIII.—A female of twenty years. On the seventh day after delivery she had nearly thirty purgings from morning till evening but she had no vomiting at all. She was much sunken and the pulse was not felt at the wrist. She had all the symptoms of severe dehydration. The wonder here is that she had not even felt the vomiting sensation with all the other choleraic symptoms in very severe form. She was much restless due to cramps and also abdominal pain. She was immediately given a good quantity of saline and was placed on Sulfaguanidine.

After four hours she developed vomiting also besides purgings which were continuing with the same severity. The symptoms of collapse were found imminent. When the party was asked to purchase Chloromycetin for her use they dodged to get it due to its heavy cost and were also confident on the patient's recovery which they had seen in all the cases treated in the isolation shed. For about five days she suffered from this teasing disease, of course with gradual reduction in purgings and vomitings day by day. For three days she was given saline and glucose both morning and evening to combat the collapse, and Sulfaguanidine was the only drug used. On the fifth day she passed coloured stools of semi-solid consistency. But on that night she had sudden rise of temperature and it shot up to 104°F. It was suspected to be puerperal sepsis. Heavy doses of Penicillin for four days could not bring down the fever. All these four days she had not even a single motion but there was no other complication except high temperature.

On the fifth day of the fever the doctor gave her it seems Chloromycetin as is given in cases of enteric fevers. By the eighth capsule, within sixteen hours or so, the temperature came down and the drug was continued upto twelve capsules. There was no further rise and she recovered from all the complaints.

POINTS OF INTEREST:—(1) The virulence of the disease during this epidemic was so severe that death occurred within twenty fours of the attack in most of the cases that died.

(2) The dramatic recovery noticed in one case during the last epidemic in 1950 prompted me to use this drug which gave me good hope.

(3) Nearly twenty cases died out of sixty attacks which were mostly untreated. The other cases that survived without any treatment took at least a week for complete recovery and were showing gradual improvement of the symptoms throughout.

(4) All the cases admitted into the isolation shed treated with prompt care and attention with salines and usual routine treatment recovered but all the cases took three to four days for improvement and recovery.

(5) In cases treated with this wonderful drug the two main dreadful symptoms disappeared mostly within twelve hours after it was administered and there was very quick recovery in general health also due to short period of suffering.

(6) In a case of puerperium the post-choleraic febrile reaction which was unaffected by large doses of Penicillin and Sulfa drugs disappeared very easily immediately on its use.

(7) The help of laboratory facilities could have given a correct estimate of the usefulness of the drug in this disease besides the symptomatic improvements observed.

(8) Anyhow the dramatic improvement and the quick recovery it had worked out in all the cases show that this is a worth trying drug in cholera with confidence though nothing is told about its action on vibrio in man.

I am told by the Department of Medical Service, Parke, Davis & Co. that Prof. R. N. Choudhury and his colleagues of the School of Tropical Medicine, Calcutta, have tried Chloromycetin in ten cases during the last epidemic in Bengal and have published their findings in the *Indian Medical Gazette*, September, 1950. Their conclusions, it seems, point out the fact that if dehydration incident is controlled earlier, Chloromycetin may prove useful to reduce the mortality rate from this infectious disease. In addition, they recommend that this may be useful prophylactically to reduce mortality rate for which treatment is to be started as soon as the case is suspected so that the patient does not reach the stage of dehydration. Experimental work recently described by Gauld and others indicate that Chloromycetin is an effective agent in the treatment of experimental cholera in mice. Complete inhibition of growth is assured with levels as low as 5 micrograms of Chloromycetin per c.c. of culture medium.

We could not very closely observe the cases and record in detail our observations. Anyhow as for my observations I feel this is worth trying as a curative measure in this infectious disease.

Myocardial Infarction and Rest

Irvin and Burgess state that the physician rigidly restricted the fluid intake of oedematous persons, with no voice but the patient's raised in protest. Surgical and obstetric patients were likewise kept at prolonged post-operative or post-partum bed rest until critical thought and perhaps the shortage of beds stimulated the re-examination of the evidence. There is no statistical evidence that bed rest or even markedly restricted activity over a prolonged period advantageously affects either the course or the later sequelæ of myocardial infarction. No controlled series of cases has been reported; yet bed rest has long been *sine qua non* in the treatment of myocardial infarction.—(*New. Eng. Jl. Med.*, 243, 486, 1950).

A CASE OF PYELITIS DUE TO BACT. COLI INFECTION TREATED UNSUCCESSFULLY WITH CHLORAMPHENICOL

SUKHENDU DAS GUPTA, M.B.,

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ABOUT four months back, I had to attend a case on the 9th day of her fever.

Patient, a female widow, aged 55 years, weighing 60 lbs., emaciated. She has her only son aged 35 years. She gave a history of fever which started insidiously 9 days back and the fever from third day was ranging between 101°F and 103°F. She was clinically anæmic. Heart and lungs—Nothing abnormal could be detected. She had mucoid stool. Urine examination revealed—Sp. gravity—1020. Albumin +, Pus cells + +, motile organisms, blood examination revealed W.B.C. 12,500, Poly—80%, Lympho—19%, Mono—1%, Stool—Ent. Histolytica cyst occasional, pus cells +.

With the idea that the case might be one of enteric fever, complicated with Bact. coli pyelitis, the attending physician started Chloramphenicol on the 6th day of fever, 4 capsules of 250 mg. each initially followed by 2 capsules every 4 hours. After 36 capsules the temperature came down to 99°F which lasted for about 12 hours, and rose again to 120°F although Chloramphenicol was being continued. However, 5 phials of 12 capsules were administered but the temperature continued. At this state blood examination revealed the following:—

Total W.B.C. 11250, Poly—82%, Lympho—16%, Mono—2%. The urine showed Sp. gravity 1025, albumen + +, pus cells +, Motile organism +. The urine was sent for culture.

Chloramphenicol was stopped and Sulphamezathine I.C.I. two tablets every 6 hours started alternately with mist. alkaline and other usual precautions for Sulpha drugs. Cardiac stimulant like Coramine by mouth and Glucose I.V. was given. After 50 tablets, the temperature came down to 100°F. to rise again to 103°F. when Sulphamezathine was stopped. The culture report of the urine was available by this time, which showed Bact. coli.

As Sulphamezathine was not effective, it was discarded and Dihydrostreptomycin was started 1½ g.m. B.D. intramuscularly. On the 3rd day and onward the number of pus cells in each field of the centrifuged sediment gradually became scanty and the patient completely afebrile after 9 gm. of Dihydrostreptomycin. Glucose I.V. and Coramine by mouth was continued all throughout this period.

POINTS OF THE CASE.—(1) Chloramphenicol was not effective for urinary infection due to Bact. coli. Bact. coli could be obtained on culture after sufficient dose of Chloramphenicol in this case.

(2) Sulphamezathine did not produce any result in this case, although given in sufficient dose. "Organisms obtained from urine of patients receiving Chloramphenicol treatment sometimes show profound morphological and cultural alterations" and may also be a factor for its being ineffective.

(3) Streptomycin proved to be efficacious for this patient of *B. coli* pyelitis resistant to Chloramphenicol and Sulphamezathine.

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Iron Encephalopathy

Birch and Till have recorded a case where severe cerebral symptoms occurred following the intravenous administration of iron. The problem of refractory microcytic hypochromic anaemia has been satisfactorily solved in many cases by the intravenous injection of an iron-sucrose complex, (*Lancet*, 1947, 2, 49). Nevertheless iron by intravenous injection and even by mouth is not entirely without risk. Iron poisoning has recently been brought to light, as ferrous sulphate by mouth has caused acute gastritis and death from hepatic failure. Cerebral symptoms following oral iron medication in man are however rare. Hurst (1931) reported the case of a very anæmic woman of 58 (Hb 18%) who took 40 grains of Ferri et ammon citras per day for 22 days and had nine convulsions in 24 hours on the 23rd day. Between attacks she was only semi-conscious and had twitchings of the face. Napier (1938) reported a case of encephalopathy in an Indian at Calcutta aged 30, who after taking 468 grains of Ferrous Sulphate in 26 days for a simple hypochlorhydric anaemia (Hb 18%) had a series of 7 fits in 24 hours. He also refers to a woman who had fits after taking 12 grains a day for 33 days. Mooney (*Br. Med. Jour.*, 1, 1951, p. 1267) mentions intense headache following an intravenous injection of 100 mg. of saccharated iron. Birch and Till now report the case of a woman aged 54 (Hb 41%) with iron deficiency anaemia, who developed severe cerebral symptoms after the intravenous administration of 380 mg. of iron in nine days. The authors however consider that the symptoms may be tentatively ascribed to iron encephalopathy and that the use of certain proprietary preparations of iron for intravenous use is valuable, safe and free from toxic effects, if they conform to a particular strength and if the dosage is kept below 100 mg. of iron per day. The danger of using unproved preparations is emphasized.—(*Br. Med. Jour.*, 13-1-1951, pp. 62-63).

DYSENTERY CAUSED BY ROUND WORM INFECTION

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P. O. Gopalbagan, Jalpaiguri.

PATIENT named, Sanicharua, a labour boy eight years old, was admitted in this hospital on 22-7-'51, with the following complaints:—

(1) Passage of blood and mucous in stool; (2) anaemia; and (3) oedema of foot and puffiness of face.

Previous history:—Patient was suffering from dysentery a month ago and was treated in out-door with Emetine and Mist. Oli. Ricini. Since then he used to pass blood and mucus in stool periodically.

Physical examination:—Patient was much debilitated. Oedema foot present up to ankle. There was puffiness of face. Anaemia present. Hb. value: 30%. Spleen enlarged 2 fingers below the costal margin. Frequency of stool about 10 or 12 times in 24 hrs. No tenesmus present but he complained of vague abdominal pain. Slight rise of temperature at evening ranging from 98.4°F. to 99°F.

Laboratory report on stool:—Consistency:—No faecal matter; contains flecks of mucus and blood in moderate quantity. Reaction: neutral. Ova hook-worm: +. Ova ascaris lumbricoids: +++. Ova trichuris trichuria: ++. C.L. crystals: +. No protozoa present. Cellular elements less.

TREATMENT.—The patient was given liquid light diet the previous evening.

23-7-'51.—(1) Santonin gr. i; Phenolphthalein gr. i; Sodi Bicarb gr. v; Pulv. one at H.S.; (2) S.S. Magsulph 1 oz. at c.m.

On the next morning he passed about 25 round-worms in the morning stool and began to pass 3 or 4 worms in every stool for the next 2 days. i.e., altogether he passed about 50 round-worms. After the 3rd day of above treatment, surprisingly I noticed that blood altogether stopped in stool and the frequency was also less.

Considering the secondary infection he was put on Sulphaguanidine 6 tablets daily for 5 days.

After a week of the above treatment, the patient was much better and a second course of Santonin was given. At this time only 5 round-worms were passed.

Treatment for anaemia was given and after a month of treatment patient was treated for hookworm infection with Tetrachloroethylene.

Patient was discharged cured on 28-8-'51.

POINTS OF INTEREST :—(1) Passage of blood and mucus in stool with no improvement by Emetine given in out-door.

(2) Laboratory report on stool does not give any suspicion of bacillary type of infection.

(3) Remarkable results were obtained by Anthelmintic treatment.

I am grateful to Dr. N. G. Mazumder, M.B., B.S., G.M.O. of this Estate for his valuable suggestions and kind permission to publish this case note.

Epididymitis in Mumps, Including Orchitis

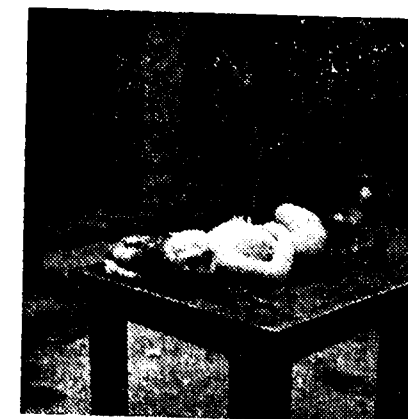
S. Candel (*Annals of Internal Medicine*, 34:20, Jan. 1951) reports a study of 66 cases of mumps orchitis, in 12 of which the orchitis was bilateral. Of the 78 involved gonads, 67, or 85 per cent, showed inflammation and enlargement of the epididymis; in 18 cases the swelling was slight; in 44, the size of the epididymis was two to four times the normal, and in 5 cases six to twelve times the normal. Often it is not difficult to determine the involvement of the epididymis, but if the gonad is much swollen, it may be difficult to outline the testis and the epididymis separately; this can be done by daily palpation as the inflammation begins to subside. In the author's study of the 66 cases, he obtained the impression that the swelling of the testis began to subside before the swelling of the epididymis. The chief symptoms of epididymo-orchitis in these cases of mumps were tenderness, pain and swelling or induration; pain and swelling disappeared fairly promptly after the temperature became normal, but tenderness persisted, in several cases, many days longer than the other symptoms. On discharge from the hospital, enlargement and thickening of the epididymis, without pain, was present in 19 cases. The most prominent sign of involvement of the gonad at the time of discharge was the loss of turgor of the testicle, which was noted in 35 tests, or 44.9 per cent of the gonads involved; evidence of atrophy of the testis was found in only 4 cases at this time. If atrophy of the testes occurs after mumps epididymo-orchitis it is evident that it is a progressive process, continuing after the patient is free from symptoms and is discharged from medical care. The fact that epididymitis occurred in so large a percentage of the cases of mumps orchitis in the author's series is of importance, as it is frequently overlooked and its real importance is not recognized. In the treatment of mumps, the injection of gamma globulin from convalescent serum has been found to reduce the incidence of epididymo-orchitis, but when the gonad has become involved, the treatment is entirely symptomatic—including rest in bed, elevation of the testis, use of an ice bag, and salicylates and codeine sulfate to relieve pain. Sterility probably does not often result from mumps orchitis; in cases in which sterility does occur, more attention should be paid to the epididymis as the possible "offending factor."—*Medical Times*.

CRANIOPHAGUS BABY WITH 4 TEETH

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ON 26th July in the early morning I was called to attend a delivery case in a village 3 miles away from my place. I went there with all my equipments.

It was a case of impacted breech and by Fillet's traction the child was delivered and there was no difficulty in the after-coming head. The child was alive for 12 hours and died at 6 p.m. on the same day. To my surprise there was a circular growth hanging from the



occiput 6 inches in diameter and 2 inches in thickness. There was a small tear in that membrane and blood was coming out. Inside there was only a very soft tissue just like brain matter. It had four big teeth, 2 upper and two lower. I took a photo of the baby as I was much interested.

Then I wrote to Sir A. L. Mudaliar, M.D., L.L.D., D.C.L., Vice-Chancellor, Madras, with a photo requesting him to enlighten me in the above case. He wrote to me that this is like double monster, what we call craniophagus. The sac that we see attached to the head is that of another foetus which is not developed and which is in a rudimentary stage.

Acknowledgement.—I have great pleasure in expressing my indebtedness to Sir A. L. Mudaliar, M.D., L.L.D., D.C.L., Vice-Chancellor, Madras, for having enlightened me in the above case.

SYMPATHETIC OPHTHALMIA

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A. B., a Hindu male, aged about 30, was brought to me by his master with the following history:

History:—He is a servant in his master's farm at Kalyan near Bombay. About 20 days ago whilst working in the field he was accidentally struck in the right eye by the horn of one of his bullocks. There was no blood in the eye at the time of the injury, but his lids were very much swollen, so much so that he could not open the eye. He fomented the eye and put some household medicine in it. About three days after the injury, when the swelling of the lids had subsided a little, he noticed that he could not see fingers in front of his eye. He waited till the swelling of the lid completely subsided and he could open the eye when he was brought to Bombay as he could not see.

State on admission:—The anterior chamber is very deep, there is a coloboma of the iris upwards, and at the upper part of the bulbar conjunctiva about three millimeters on the upper and outer side of the limbus there appears a cystoid swelling under which the lens is dislocated (subconjunctival dislocation of the lens). The tension of the eye is minus.

Both the subconjunctival dislocation of the lens and the minus tension suggest that the injury is of a perforating nature.

Ophthalmoscopic examination:—Shows that the vitreous is full of blood and no details of the fundus can be made out beyond a very faint fundal glow.

Vision:—R.E. = No. P. L.; L. E. = 6/6.

The fundus and all the media of the left eye are perfectly normal. There is neither lacrimation nor vascular injection nor photophobia nor pain in the left eye.

TREATMENT.—The patient was advised and persuaded to have the right eye enucleated as there was no vision in it and as otherwise there was every chance of his losing the left eye also by sympathetic ophthalmia.

Though I did not tell the patient, his relatives as also his master were informed that as already 20 days had elapsed since the injury, the left eye may be affected even after enucleation.

The patient refused to stay in Bombay to have his eye removed and even to take Cyanide injection. He was, therefore, given Guttæ Atropine Sulph. 1%, Mercury injections and Mist. Sodii Salicylas (grs. xx to 3i) t.d.s.

After a fortnight the patient came to me again complaining of redness and pain in the left eye. He had also marked lacrimation and photophobia.

[938]

On examination:—The R. E. was the same as before. The L. E. had vision reduced to 6/60. There was slight ciliary injection and the dark room examination showed the vitreous and other media hazy and the fundus could not be seen clearly but as if through a fog. There were no K. P. to be seen. Evidently "Sympathetic Irritation" had set in the left eye.

TREATMENT.—The patient now agreed, though unfortunately too late, to have the right eye enucleated; but the next day though much persuaded he refused enucleation and wished to be treated by medicines only. After a great deal of persuasion he agreed to take Hg. Cyanide injection which was given and he was put on the following treatment: (a) Guttæ Atropine 1%, thrice daily in both eyes; (b) Mist Sodii Salicylas (grs. xx to 3i) t.d.s. and (c) inunctions of Mercury. This treatment was continued for five days but the eye was getting worse day by day and a very thorough examination on the next day showed very fine K.P. on the cornea of the left eye. The mediæ were very hazy and the vision was reduced to counting fingers at about 12 ft.

The patient after persuasion now consented to have his right eye removed which was done on the following day. Of course the patient and his relatives were told that it was too late, especially as sympathetic ophthalmia had already commenced in the left eye. On the following day he was given a second subconjunctival injection of Hg. Cyanide (viii minims of 1 in 2000) combined with the other treatment as before viz., Atropine, Salicylates, Atophan tablets 7½ grains t.d.s. were tried. As the patient was finding no relief he left after a week, since when I have not heard of him. His vision on discharge was about 10 ft.

I believe this case brings out the following facts regarding sympathetic ophthalmia very clearly:

(1) That sympathetic ophthalmia follows a perforating injury to the exciting eye. Purulent uveitis or panophthalmitis in one eye never causes sympathetic in the other.

(2) An interval of at least 14 days is required between the injury in one eye and the onset of sympathetic in the other. Generally between the 6th and 8th week is considered to be the most dangerous. In the above case the sympathetic trouble commenced about the sixth week.

(3) That in every case of perforating injury—more so when there are no chances of saving any vision in the injured eye—the eye must at once be enucleated to save the other eye.

Though in the above case I cannot say whether enucleation of the injured right eye would have stopped the onset of sympathetic in the other, as already about 20 days had elapsed after the injury when the patient was first seen, yet as there was no vision in that eye advising enucleation was justifiable. Of course in such cases our prognosis must be very guarded.

(4) The best time to enucleate the exciting eye is within 24 hours after the injury and even then we cannot say with certainty that the other eye is safe from sympathetic ophthalmia unless at least four weeks have passed after enucleation of the injured eye.

(5) The sympathetic ophthalmia in the above case commenced with what is known as "Sympathetic Irritation", the most common symptoms of which are lacrimation, vascular injection, photophobia and pain, all of which were present in the above case.

Though in this case the onset of sympathetic ophthalmia was preceded by all the signs of "Sympathetic Irritation" yet in many cases "Sympathetic Irritation" lasts a very long time without being followed by sympathetic ophthalmia.

(6) The much discussed question whether the exciting eye should be enucleated or not after a sympathetic has already commenced in the sympathising eye may be answered from the above case in which the exciting eye was enucleated after sympathetic had already commenced, because there was not the slightest hope or chance of retaining useful vision in the exciting eye. Hence we would be justified in enucleating the exciting eye only if there is no chance of retaining useful vision in that eye and not otherwise.

Thrush in Infants

The general belief that oral thrush is a benign disease of infants which scarcely merits attention is a dangerous illusion. Thrush is caused by the fungus *Monilia albicans*, which is saprophytic to man except in conditions specially favourable to it. Such conditions occur in the mouth of the young infant and the vagina of pregnant women, for both possess acid secretions with an unusually high pH close to the optimal for the organism. This is the main reason for the high incidence of oral thrush in early infancy and vaginal thrush in pregnancy. Repeated routine swabbing of the mouth in newborn infants showed that infection of the mouth with *Monilia albicans* in the neonatal period almost always causes thrush lesions within 2 to 8 days.

The characteristics greyish white adherent colonies and plaques of thrush of the mouth, are most frequently seen on the tongue but usually affects several parts of the buccal cavity. As a rule the lesion covers only a small part of the mucosa at the height of the disease. There are no symptoms and the infection gradually subsides. But such a benign course should never be assumed, for the disease may progress and cause fatal lesions in the alimentary tract or elsewhere. There is thus a potential danger in every case of thrush, particularly in premature and debilitated infants. The application of gentian violet 1% in aqueous solution twice daily in the early stages of oral thrush usually checks the spread of lesions and causes their disappearance in a week.—(Summary of leading article *Br. Med. Jour.*, 23-12-1950).

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EDITORIAL

Contributions are invited from the medical profession in India and abroad in the form of original articles, clinical lectures, medical society addresses, reports of interesting cases, condensed extracts of useful articles appearing in other journals with or without comment, practical hints & recipes, experiences with new preparations and inventions, vital statistics, therapeutic notes, communications etc. Contributions should ordinarily not exceed 8 pages of the journal excluding spaces occupied by illustrations if any.

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A CENTRAL MEDICAL COUNCIL WANTED

WITH the slow and steady growth of medical personnel in this country and the accelerated growth that is expected in the near future as a result of the prospective establishment of more and more medical colleges to secure the personnel needed to meet the ever-growing needs of the people, the medical profession is coming to its own and it has become absolutely necessary to regulate its growth and the practice of the profession by the members on a proper and sound basis so that India can stand on a par with other advanced countries in the West. We have in India the Medical Council of India, and in many States there are Medical Councils, some of them statutory and the rest non-statutory. While responsibilities might have devolved on non-statutory Medical Councils in some of the States, the lack of statutory authority disables them from discharging their duties satisfactorily. The position cannot be left in this fluid state any longer and something has to be done, and that too without delay, to enable them to discharge their duties and responsibilities satisfactorily.

Presiding over the meeting of the Medical Council of India held last month in New Delhi, Dr. C. S. PATEL, President of the Council, pointed out that only the formation of a Central Medical Council with a number of zonal offices in the States would help solve the peculiar medical and health problems of the country. It is accepted on all hands that India lacks the required medical personnel to meet her requirements. And the Governments in the country will have, sooner or later, sooner than later, to give up the snail's pace at which they are progressing and establish a large number of Medical Colleges to prepare the personnel necessary to equip

the present ill-equipped institutions and to man the large number of institutions that have to be established to meet the growing needs of the people. It is a matter for satisfaction that the caste system which had till a short while ago disfigured the profession and created schism among the ranks has been given up and medical schools have been abolished. But the ever-growing and pressing needs of the country appear, unfortunately, to have caused a setback to the progressive thoughts of some State Ministers and diverted them from the royal road to short cuts, i.e. providing additional medical personnel through shorter courses. This, in effect, would only mean the revival of the caste system which it took many years of hard struggle for the medical profession to get abolished. And this, inspite of the repeated statements by the Hon'ble the Minister for Public Health with the Government of India that there can be in the country only one medical qualification and that is the M.B., B.S., Degree. True it is that the course is too long, arduous and costly that serious attention has, of late, been given to the question of the reduction of the course by the elimination of some subjects, or by the reduction in the period allotted to them. Even at this meeting of the Medical Council this subject was discussed, we are told, at considerable length, on the recommendation of the Executive Committee, but it was decided to circulate it to the Universities for their opinion in the matter. The course followed by the Medical Council is the correct one since the recommendations of the Executive Committee of the Council in this and other matters have caused some surprise in some quarters on the ground that they are beyond the scope of the Council. Be that as it may, and whatever be the final decision taken by the Council on other matters, there can be no gainsaying the fact that "Free India", in the words of Dr. PATEL, "needs an adequate number of properly qualified and specialised persons in the different branches of medicine and we should be content with nothing short of the highest available standards elsewhere in the world. We cannot afford to continue to entrust human life to the hands of half-baked or unqualified persons." "This objective", he says "can be achieved only by the formation of a single central body like the Medical Council of India on the lines of the General Medical Council of Great Britain."

We are aware that strong protests were voiced forth recently at a conference of licentiates held in the Punjab that the Medical Council has not justified its existence and that it is more a fifth wheel in the coach than a body interested in the advancement of the profession and that its achievements are next to nothing. One has to take into consideration the restrictions under which it has to labour. True it is that it was modelled at that time on the lines of the General Medical Council of Great Britain but it was not placed in a position analogous to that of the General Medical Council. Place it on a sound and satisfactory basis, bestow it with

powers needed to achieve the objects in view. It is bound to become an useful and efficient organisation not only for the purpose of taking legal proceedings against unqualified practitioners for unprofessional conduct but also help advance the cause of medical education and medical standards in this country.

This raises the question of the status to be assigned to the practitioners of the indigenous systems of medicine in the future set-up. Some people are swayed by national sentiment and are anxious to place these systems on a par with the allopathic system of medicine. Having played a large and noteworthy part in times of yore and still having a large number of votaries, no one would say that these systems should be relegated to the past and not given any recognition or encouragement. But even the protagonists of these systems candidly admit that they have remained static for long and require to be placed on a sound footing by making advancements therein through research and otherwise. It is one thing to say that these systems should be given the encouragement they need, but it is another thing to say that even people professing to have only a smacking knowledge of these systems should be let loose on the society to fill up the gap between the need and the actual availability of medical practitioners. We very much regret that the consideration of the recommendations of the sub-committee on indigenous and homœopathic medicines has been postponed to the next meeting. These have become burning topics on which the opinion of the Medical Council should be made known early with a view to enable the Governments, both in the Centre and in the States, to so shape their future policy that the best interests of the country and of its people can be well and truly served.

The suggestion of Dr. PATEL for the establishment of a Central Medical Council with a number of zonal offices is an important contribution to the solution of the problem facing the profession. What the constitution of the Council should be, what powers should be entrusted to it and what relationship should exist between the Council and the Government, are all matters of detail which can be worked out after due consideration. The basic question whether there should be established in India a Council of the kind envisaged by Dr. PATEL should be given due consideration by the members of the profession in their organisation and their views on the subject made known to the public, the Council and the Governments.

EXPANSION OF MEDICAL AID

MEDICAL aid is so very limited that so many preventable deaths occur in this country. It is not therefore out of place to harp on it at every available opportunity with a view to draw the attention of the Governments to the urgent need of taking a long step forward. Particularly, infectious diseases such as

tuberculosis, malaria and the like always lie in wait in every corner, awaiting the opportunity to lay their strangle hold on healthy but innocent people. We have been repeatedly urging on the attention of the Governments the immediate and urgent necessity of improving public health and extending medical relief on a large scale, to ensure positive health to the people with a view to enable them to take their legitimate share in the implementation of plans intended to take the country forward in its industrial and economic spheres. But as we have pointed out on a previous occasion the Planning Commission has not given as much attention and importance to it as it deserves. The wealth of the nation is dependent on the health of the people and therefore health programmes have to be given top priority even to enable the Governments to go ahead with their plans.

Replying to Mr. R. SURYANARAYANA RAO the other day in the Madras Legislative Council whether the Government have formulated any plan for the extension of the facilities for the diagnosis and treatment of tuberculosis, eye diseases, ear, nose and throat diseases, venereal diseases and leprosy, the Hon'ble KALA VENKATA RAO, the new Minister for Public Health and Medical Relief, stated that these diseases are treated in all hospitals in the State to the extent treatment can be given in such hospitals. Under the post-war scheme of expansion of medical relief it is intended to make provision for a first class laboratory, X-ray department, special departments for tuberculosis, venereal diseases, leprosy and eye diseases and to have specialists in each of these departments. Proposals have been called for from the Director of Medical Services, for improvements to venereal diseases clinics in some of the District Headquarter Hospitals and for the establishment of a Central Reference Laboratory for venereal diseases at the King Institute, Guindy. for being brought forward as a Part II programme for 1952-'53. Special clinics for the above diseases are opened wherever necessary. It would have been interesting and instructive if the Hon'ble Minister had furnished details as to the number of clinics that have been opened for the treatment of these diseases with a view to appraise them at their true worth. That apart, the statement of the Hon'ble Minister makes it clear that the establishment of these additional facilities will be only in the Metropolitan hospitals and some of the head-quarter hospitals. Diseases of this kind have the special knack of laying their hold on people without differences of area, caste, creed etc. In that respect they scrupulously follow the fundamental rights guaranteed in the Constitution that there shall be no distinction of caste, creed, sex etc. And it is a well-known fact that the majority of the people are poor that they cannot afford to bear the expenses involved in transporting themselves to places where these facilities are proposed to be made available. Only when these facilities are placed within the easy

reach of people in every nook and corner of the country, can the Government lay claim to have discharged their elementary responsibility to the people. Maybe it will not be possible for the Governments in our country, conditions being what they are at the moment, to launch on ambitious and all-pervading schemes as those launched by the Government in Great Britain. But they are bound to make suitable provisions for the improvement of public health and the expansion of medical relief, whatever their financial position. No superstructure raised without proper foundation can stand the stress and strain of every day life. The present governments in India are at the fag end of their career and nothing substantial can be expected to be done within the remaining short period of their office. It is up to the people to demand of the candidates who are seeking their support in the forthcoming elections an assurance that top priority will be insisted upon, if they are elected, to the problems of public health and medical relief. In this way they can help themselves. Self help is the best help.

Reactions to Glucose (Dextrose)

Febrile reactions following intravenous injections of solutions, were formerly put down to the bacteria existing in river water and tap water. It is not the bacteria *per se* but their toxic products. Elimination of pyrogens, (which were considered responsible for febrile actions) is achieved in several ways. Some authors consider that the rapidity of the infusion is responsible for some of the shock symptoms.

Randolph *et al*, (*Arch. Surgery*, 61, 554, 1950) are of the view that there remains a residue of reactions even after complete elimination of all pyrogens and regulation of speed of administration. The fact that only a few patients have reactions, while most do not suggest that an individual idiosyncrasy or allergy plays a part. These authors stress that sensitivity to corn occurs as often as sensitivity to wheat, if not more so. They demonstrated that crystalline sugars prepared from corn-starch may cause intense allergic reactions when ingested by sensitive people. The rapidity of the onset and the severity of the reactions clearly indicate in such cases that the sugar is allergenic in the form administered. Patients who are sensitive to corn or corn sucrose, are often found to tolerate alpha-d-glucose from beet sucrose; conversely glucose prepared from beet sucrose will produce allergic reactions when ingested by patients known to be sensitive to beets.

The authors reproduced in 5 patients who showed great sensitivity to ingestion of corn and corn products, similar allergic phenomenon by intravenous injection of a 5 per cent dextrose solution. *It, therefore, appears probable that some of the stormy post-operative courses may be explained on the basis of allergy to dextrose*—(Editorial in *J.A.M.A.*, 144, 16, 1379, 1950).

SURGERY

Pros and cons of tonsillectomy.
—(*B.M.J.*, 20-1-1951).

In the above article, Dr. A. H. Gale of the Bristol University discusses the pros and cons of tonsillectomy, in which considerable differences exist. The problem has recently become more complicated than ever, because of the increased prevalence of poliomyelitis. The statistical evidence relevant to the general indications and contra-indications for operation is critically examined by Gale. Kaiser's survey of 4400 children in U.S.A. schools, half of whom had the operation and the other half had not, is the most comprehensive of all and he lays down the following points as definite indications for operation: (1) Interference with normal breathing, and snoring; (2) difficulty in swallowing; (3) nasal or altered voice; (4) persistent nasal discharge; (5) otitis media and impaired hearing; (6) repeated attacks of tonsillitis or quinsy; (7) enlarged cervical glands; (8) chronic sinus troubles; (9) rheumatic fever; (10) pyelitis; nephritis; (11) retarded mental development; and (12) impaired nutrition and anorexia. Gale, however, is not in total agreement with these suggestions as some of them are not borne out by incontrovertible evidence.

The "Report on Epidemics in the Schools of England" relating to children over 13 years of age concludes with these observations: "One cannot avoid the conclusion that there is a tendency nowadays for the operations to be performed as a routine prophylactic ritual for no particular reason and with no particular result." In a more recent follow-up of 337 children operated on at the Radcliffe Infirmary at Oxford in 1947-1948, no special advantage or benefit had been derived by the operated children, except perhaps a slightly reduced liability to sore throats and colds.

At the discussion held at the Royal Society of Medicine in London (*Proc.*

Royal Soc. Med., 1950, 43, 317). The following important recommendations were recorded:

(1) Tonsils should very rarely be removed before the age of 5. Adenoids should however be removed at any age and that only if they cause severe nasal or eustachian obstruction. Causes other than adenoids causing nasal obstruction should first be eliminated.

(2) Tonsillectomy should not be performed on a child who has never had symptoms, whatever may be the appearance of the tonsils as this varies enormously in the same child and at different times.

(3) Tonsils may be removed only when frequent attacks of tonsillitis with fever occur and true tonsillitis should be carefully differentiated from transient sore throat. The number of attacks in a year is not so significant as the consideration of the degree of general disturbance—temperature, duration etc.

(4) Tonsils should be removed after a suitable interval after quinsy.

(5) Tonsils should be removed in the very rare instances where they are so enlarged as to cause mechanical obstruction.

(6) Tonsils should be removed in chronic diphtheria carriers when other treatments have failed.

Recently some amount of justifiable anxiety has been felt because of the suspected association of poliomyelitis (of the bulbar type specially) with tonsil operations. In a nationwide survey of polio cases treated in hospitals in England in 1949, 16 cases of poliomyelitis were reported to have followed within a month of operation for tonsillectomy.

It is, therefore, considered better to delay the decision to operate, than to hurry it and above all to avoid operation on tonsils which have recently been inflamed.

Fallacies in acute appendicitis.—

A study of acute appendicitis was begun at New Orleans Charity Hospital in 1933, and 7,613 cases were analyzed in seven series. The total mortality rate was 4.46%, but it has declined successively from 6.58 to 1.7%. Despite this decline, the incidence of complications is increasing. This may be partly explained by the fact that many patients entered the hospital after the first 24 hr. of illness and that more than a third had taken purgatives, sometimes on the advice of physicians. Enemas were also ordered by physicians, and icebags are again being used. Apparently, many physicians are not aware that appendicitis is often an atypical disease. The physician should not wait 12 hr. to "re-evaluate" a patient; operation should be performed at the end of six hours if acute appendicitis cannot be ruled out. That the mortality rate has declined despite the aforementioned deplorable tendencies is largely due to intensive supportive therapy and to chemotherapy. The limitation of chemotherapy is stressed: many delays in surgical treatment must be attributed to its unjudicious use. The author favors prompt operation, because: (1) The diagnosis of rupture of the appendix is inaccurate. (2) It is impossible to determine whether peritonitis is spreading or is localizing. (3) A localized abscess may rupture intraperitoneally and cause death. (4) A properly performed surgical procedure that removes the source of infection is safer than continued entrance into the peritoneal cavity of infection from a ruptured viscus. (5) The results of conservative therapy are no better than the results of prompt surgery. While the curative properties of the antibiotics should be utilized, it should be remembered that they are ineffective in areas of inadequate circulation, such as in gangrenous processes and walled-off abscesses. In uncomplicated cases of acute appendicitis these agents are adjuncts to, not substitutes for surgical procedures.—*Journal of American Medical Association*.

A simple method for the management of scalp wounds—I. Phillips Frohman, M.D. (From "*Medical Annals*

of the District of Columbia", Dec., 1949).

For the past eight years, because of a large experience with scalp wounds, I have developed a form of treatment which has proven of value. This plan encompasses the following features: (1) simplicity, (2) avoidance of special technical training and equipment, and (3) minimum of discomfort and apprehension to the patient. Approximately 365 wounds have resulted in primary healing without serious infection.

Anatomy.—The first and third layers of the scalp, namely, the skin and epicranial muscle, are firmly united by fibrous processes which pass from the skin through the second or subcutaneous fatty layer to the epicranial muscle. This intimate association of layers usually produces a "clean type" of wound in scalp lacerations. This is distinctly different from wounds seen in the abdomen or the extremities, wherein there is retraction of the muscle from the fascia, the fascia from the fatty layer, and the fatty layer from the skin.

The blood vessel arrangement of the scalp is likewise strikingly different from that of any other part of the body. The vessels are supported in a loose cellular layer which lies between the scalp proper and the pericranium. Further, the vessels lie immediately within the tough inelastic layer of subcutaneous tissue. The latter is made up of strong, short, fibrous septa which contain small granular fat lobules. This anatomic relationship of blood vessels explains their unyielding character when an incision or laceration occurs in the scalp. Two main stem arteries which anastomose freely over the median plane are responsible for the blood supply of the entire area. They are respectively the internal carotid for the frontal area and the external carotid for the remainder of the scalp. Since the blood supply of the skin is continuous with the underlying tissues, injuries of the superficial tissues in the scalp may survive even though a considerable portion of the scalp is detached from the cranium. Hemorrhages superficial to the epicranial muscle are usually limited to this area because of the density in the subcutaneous layer, whereas hemorrhages

beneath the epicranium muscle are rarely extensive because of the presence of small vessels. Further, extravasations of blood beneath the pericranium lead to hæmatomas that are limited entirely by the skull sutures.

Material studied:—Wounds seen in this study were caused by the following materials: glass, slate, rough and smooth stones or bricks, sharp objects, and blunt weapons, such as blackjacks, sandbags, moving crane buckets, steel beams, falling timber, etc. These wounds in the vast majority of instances were of the "clean type". It has been my observation that the greater number of scalp wounds, except for the most trivial, are associated with division of the aponeurosis and separation of the epicranium. Extensive bleeding which appears with the immediate injury is usually self-limited, and profound hæmorrhage from scalp wounds is rare.

The period of study for this series extends from 1941 to 1948, and includes 365 scalp lacerations treated in my office. The wounds are classified into the following types: (1) superficial, or those which include the skin and fatty layers, (2) deep, in which all 3 layers are involved, and (3) complete, in which actual avulsion of the scalp occurs. Break-down of the wounds in this respect reveals that 334 were superficial, 23 were deep, and 8 were complete; the length of wounds varied between 2.5 and 15 centimetres; 289 occurred in males and 76 in females; 212 were children and 153 were adults.

Treatment:—The method of treatment includes the following plan: The wound and scalp are thoroughly washed with either sterile normal saline or zephiran solution, since repeated washings are necessary for the removal of all loose debris and blood. No attempt is made to shave the scalp or remove the hair adjacent to the linear edges of the wound. After adequate washings, the wound is carefully evaluated. If the aponeurosis is split or torn, an X-ray film of the skull is made. It is a good procedure to make X-ray films of all scalp wounds. All devitalized tissue is debrided. Local anæsthesia is not instituted.

If the wound is of the "superficial" type, no deep sutures are applied, but the wound is dusted with sterile sulphathiazole crystals and the skin edges are approximated with Michel clips $\frac{3}{8}$ of an inch apart. The advantage of clips over sutures is the simplicity of application and the prevention of inversion of the skin edges. This accomplishes a side-to-side approximation of the superficial parts of the skin.

If a deep wound is present, a minimal number of 00 chromic sutures are placed in the fascia and muscles. Again, sulphathiazole crystals are applied and the skin edges approximated in the usual manner with Michel clips. Drains are used in scalp wounds. The skin clips are applied $\frac{3}{8}$ of an inch apart.

In the event of the complete type or avulsion of the scalp, following the washing and debriding the muscles and fascia are closed with 00 chromic catgut, the wound dusted with sulphathiazole crystals, and the clips applied to the skin. Penicillin is not employed locally or as part of the definite after-care of scalp wounds. In this entire series severe wound sepsis has not been seen. Another innovation in treatment which is probably different from the usual recognized methods is that dressings are not applied. The hair is simply pulled over the clipped area. A routine practice in the definitive care of these patients is the use of tetanus antitoxin alone, or tetanus antitoxin and gas bacillus vaccine. The vaccine used depends on the circumstances surrounding the injury. After this care the patient is instructed to return to the office within 24 hours. With the superficial type of wound, a firm blood crust is usually seen at this time. The patient is carefully instructed not to comb his hair. After 48 hours the wound is observed again. If primary healing has taken place, the skin clips are removed and the patient is warned to avoid trauma for another 5 to 7 days. A final examination is then made. In extensive wounds the scalp clips are left in place for 72 hours. If a hæmatoma develops, the wound is aspirated under sterile precautions with an 18-gauge needle.—*General Practitioner*.

Pseudocysts of the pancreas.—Pancreatic cysts have been divided into (1) pseudocysts (traumatic, inflammatory); (2) retention cysts; (3) neoplastic cysts (cystadenomas, cystadenocarcinomas, sarcomatous, teratomatous); (4) congenital cysts; (5) parasitic cysts; (6) miscellaneous pancreatic cysts, cystic hemangio-endotheliomas, cavernous hemangiomas and epidermoid cysts.

This report is concerned with the 44 cases of pseudocyst of the pancreas in which surgical treatment was performed at the Mayo Clinic during the years 1935 to 1947 inclusive. A pseudocyst of the pancreas is a collection of material of a more or less fluid consistency usually adjacent to but occasionally within the pancreas which may result from inflammation or trauma. Such a cyst is surrounded by a sac which does not have a lining epithelium, in contrast to a true retention type of cyst. Pseudocysts are one of the most common types of cystic lesions of the pancreas. Pancreatitis appears to be the most frequent etiologic factor in the development of a pseudocyst. Characteristically, a patient who has a cyst of this type presents a history suggestive of recurring pancreatitis and a rounded mass somewhere in the upper part of the abdomen. The mass may change in size or at times disappear entirely between attacks of abdominal pain. Occasionally pain is absent or minimal. Roentgenologic studies may show abnormalities in the stomach or duodenum caused by pressure from the cyst.

There has been considerable controversy regarding the surgical treatment of pseudocysts of the pancreas. In the 44 cases here reviewed incision and drainage was done in 19 cases; incision and marsupialization in 12; complete excision in 5; excision of cyst and partial pancreatectomy in 3; partial removal of cyst in 1; no surgical treatment of cyst in 4 cases. The authors say that some authors regard complete excision as the best treatment, but at the Mayo Clinic it has been observed that pseudocyst of the pancreas, unless unusually small, does not lend itself well to total excision as it does not have the wall of a true cyst, is adherent to all surrounding structures and may require quite an

extensive and hazardous operation for its total extirpation. It seems certain that if complete removal were attempted in all cases, the operative mortality would be excessive. Seldom if ever does it appear justified to perform partial resection of the pancreas in order to remove a pseudocyst, especially if the cyst is located in the head of the gland. Internal drainage by anastomosis of the cyst to the stomach, gallbladder or jejunum has been reported. In most cases and for most surgeons external drainage of adequate duration, preferably by marsupialization if the cyst is large, appears to be the treatment of choice. Although recurrence may take place if drainage is maintained for too short a time, this can be prevented in almost every case by careful postoperative care. The chance of serious infection developing in the cyst and adjacent structures during drainage is minimal with irrigation of the cyst and the antibiotics which are available today. Probably the main objection to this type of treatment is the prolonged care necessary while the cystic cavity is gradually being obliterated. Serious excoriation and digestion of the skin surrounding the site of drainage do not occur after drainage of a pseudocyst even though the material which drains is composed solely of pancreatic juice since the latter is inactive before it enters the duodenum. Attempted obliteration of a pseudocyst by injection of a sclerosive or necrotizing agent is not recommended.

Incision and drainage with or without marsupialization was found most advantageous at the Mayo Clinic. Cysts recurred in only three of the 31 cases in which treatment of this type was employed. In each of these three cases it appeared that an inadequate period of drainage had been maintained.

(Brilhart, K. B. and Priestley, J. T., *American Journal of Surgery*, 81:151-160 (Feb.) 1951. The authors are connected with the Mayo Clinic, Rochester, Minnesota).—*Surgical Newsletter*, U.S.I.S.

Traumatic shock.—Hugh C. Ilgenfritz, M.D., (from "*New Orleans Medical and Surgical Journal*," Sept., 1949).

Peripheral circulatory collapse is the commonest cause of death in patients who have suffered severe traumatic injury. Many individuals who have sustained fractures, lacerations, internal injuries, or even damage to the tissues of the central nervous system following violent trauma may recover without incident; others whose injuries appear to be comparatively minor may succumb to shock within a few hours.

Although many widely different aetiological factors may cause shock, the physiologic basis for the condition and the mechanism of its production still are not entirely clear. The clinical picture, however, is only too well known to every physician.

Clinical picture:—The patient in shock is characteristically in a state of general collapse; although fully conscious, he may be scarcely able to speak or move. The skin is pallid, cold, and damp, occasionally exhibiting tiny droplets of perspiration. The pulse, at first relatively normal in character, soon becomes weak and thready, often with little acceleration in rate until the later stages of shock. Respirations are shallow, the expenditure of efforts by the muscles of respiration being little more than barely sufficient to keep the patient alive. Occasionally a patient in the earlier stages of shock may be restless and excited; frequently also nausea and vomiting may appear. As the condition progresses, however, the excitement gives way to dullness, apathy, and decreased sensitivity, until even the perception of pain may be lost. The blood pressure always falls, often to such a low level that it can scarcely be determined, and the temperature is typically subnormal.

Crushing injuries, especially with fractures of long bones and widespread devitalization of muscle tissue, are most likely to produce shock, which appears an hour or more after injury. Frequently, however, secondary influences such as loss of blood, chilling, insufficient fluid intake, severe pain, fear, or anxiety, may aggravate the efforts of a comparatively minor injury and may produce shock unexpectedly many hours after the accident or may increase the

severity of a state of shock already developing.

Physiological characteristics:—While shock can be produced by many different types of injuries such as trauma, burns, or hemorrhage, the physiologic characteristics are much the same. As a result of local injury to the blood vessels following a traumatic accident, plasma and blood are lost into or from the tissues of the traumatized area. This withdrawal of fluid from the blood stream reduces the circulating blood volume, and the cardiac output and velocity of blood flow decrease correspondingly. Reflex peripheral vasoconstriction suffices to maintain the blood pressure above shock level for a short time, but as the vascular fluid loss continues or the compensatory vasoconstriction begins to fail, the blood pressure drops to shock level and tissue anoxia results, with asphyxia and depression of function of the heart, liver, kidneys, lungs, and brain. Hemoconcentration develops as the loss of plasma continues, the erythrocyte count and haemoglobin content of the blood rising in proportion to the withdrawal of plasma. At this stage, the capillaries throughout the body become anoxic and dilated, impounding large quantities of sluggishly moving blood. The increased viscosity of the blood interferes still further with its passage through the capillaries, and the venous return to the heart decreases concomitantly. If the vicious cycle of shock is allowed to persist untreated for too long a time, the tissue asphyxia produces irreversible damage to the vital structures, and therapeutic measures then are of little value.

Traumatic or surgical shock does not appear instantly after the injury has been sustained, but appears an hour or more later, since it depends upon a significant loss of blood or plasma. The collapse which follows immediately after a relatively minor injury is often called primary shock, but is actually a transient hypotension due to reflex vasodilatation on a neurogenic basis. Collapse of this type is similar to the sudden drop in blood pressure which may occur during spinal anaesthesia or may follow a severe emotional reaction. Here there is a sudden fall in blood

pressure as a result of the impounding of a large amount of blood throughout the dilated peripheral vascular bed, but there is no loss of fluid from the blood stream, nor is there any change in the blood volume or the total cell mass. This reaction is temporary and recovery is usually prompt.

Oliguria or anuria may follow traumatic or surgical shock, probably as a result of decreased blood flow in the renal vessels. As a rule, kidney function returns to normal after shock has been controlled by blood transfusion. In some cases, however, especially in the presence of extensive crushing injury, a characteristic renal lesion occurs, with resultant anuria which may prove fatal. The suppression of renal secretion in the crush syndrome is accompanied by necrosis of the distal tubular epithelium in the kidney; this condition, similar to that occurring as a result of severe haemolytic transfusion reaction, has been called "lower nephron nephrosis." While prophylactic measures probably are of little value in preventing development of the condition, it should be foreseen when severe crushing injuries are present. Treatment for shock is instituted as promptly as possible in such cases, and, as soon as the patient is in satisfactory condition for operation, all devitalized tissue is excised, fascial compartments are split if the underlying muscle appears tense or swollen, and amputation is performed when indicated. It is a wise precaution to chart the daily fluid intake and urinary output in every patient who has suffered a severe traumatic injury, but it is especially advisable when crushing injuries are present.

TREATMENT.—Before surgical treatment of a moderately severe traumatic injury is begun, the possible presence of a pre-shock state should be considered. Even though tissue damage has been relatively severe and a significant amount of vascular fluid loss has occurred, the blood pressure may be maintained within a relatively normal range for a short time by reflex peripheral vasoconstriction. A patient thus may be on the verge of collapse and yet may be able to talk or even sit up. If repair of injuries is attempted before treatment of im-

pending shock is begun, the pre-shock state may progress suddenly to profound collapse. Premonitory signs of threatened shock include anxiety, agitation, restlessness, pallor, cold clammy skin, rapid soft pulse, and a moderate drop in blood pressure. The reduction in blood volume cannot always be demonstrated early in the course of the post-traumatic state by means of blood counts and haematocrit determinations. Even though enough blood or plasma has been lost following injury to produce a state of shock, the erythrocyte count and the haematocrit value may still be within the normal range for a variable length of time after the accident.

The best treatment of shock is prevention. Many patients who could survive their injuries die of the associated shock. The treatment of fractures, lacerations, head injuries, and even of thoracic and abdominal trauma can wait with safety for one or more hours if necessary until the blood volume has been restored by transfusion, the blood pressure has risen to a safe level, and the patient is no longer in danger of shock. The only two surgical emergencies which offer a greater threat to life than secondary shock are continuing hemorrhage and obstruction of the respiratory tract. Either of these conditions must be relieved instantly; this having been done, the treatment of actual or impending shock takes precedence over the care of any other surgical condition.

The injured patient is disturbed as little as possible; measures are taken to prevent further injury and to reduce discomfort. Fractures are splinted, wounds are covered with sterile dressings, and morphine is administered if needed. Definitive treatment of injuries is postponed until after shock or impending shock has been brought under control. Blankets are used to conserve body heat; hot water bottles or heating pads are not used, to avoid increase of blood flow in the skin and consequent withdrawal of blood from the vital centres. Morphine is given for pain, but never when undiagnosed visceral damage may be present. Stimulant drugs are used only to help maintain the blood pressure at a relatively safe level until transfusions or infusions can be secured. Such

drugs are of much value in neurogenic hypotension, when injury has been slight, but are potentially dangerous when the fall in blood pressure is accompanied by significant reduction of the total blood volume.

Restoration of the depleted blood volume is best accomplished by transfusion of whole blood; enough is administered to raise the systolic blood pressure at least to a level above 100 millimetres of mercury. The quantity of blood which may be required varies according to the extent of trauma, the length of time that has elapsed since the injury, the condition of the patient before the accident was sustained, and the amount of blood or plasma which has been lost. In some cases, a state of impending shock can be treated successfully with a single transfusion of 500 cc. of whole blood; in other cases, 40 per cent or more of the total blood volume may have been lost, and from 1,500 to 2,500 c.c. of blood may be required for full replacement.

If blood is not immediately available, plasma is the best substitute; it is given rapidly and in sufficient quantity to raise the blood pressure safely above shock level. No attempt is made to restore the blood volume entirely to normal by transfusion of plasma alone, since the red cell deficit also must be corrected by subsequent administration of whole blood.

If plasma is not available, normal salt solution, with or without dextrose, is given slowly by infusion until compatible blood can be obtained. While less satisfactory than plasma as a substitute for blood, crystalloid solutions are of life-saving value in supporting the depleted blood volume for a short time.

Other blood substitutes, such as solutions of concentrated human serum albumin and of purified gelatin, appear to be of much value, but are not generally available; still others, such as pectin and bovine serum albumin, are efficacious but are unsafe for general use because of their toxic properties.—*General Practitioner*.

Tonsillectomy and poliomyelitis.—Opinions vary as to whether tonsillectomy should be performed during the summer and autumn which comprise the endemic period of poliomyelitis.

Dunn (1950) points out that in choosing the time for tonsillectomy the dangers of respiratory infections during winter should be weighed against those of poliomyelitis in the summer.

The average incubation period of poliomyelitis is 12·2 days (Dowe, 1950). If the virus is present in the pharynx when tonsillectomy is performed the operation may precipitate the disease within 7-21 days. The contacts of an infected patient frequently have the virus in the naso-pharyngeal washings, and it has been found in the stools of contacts for two months after exposure. From a study of fatal cases it has been demonstrated that the virus often reaches the nervous system from the pharynx.

During an epidemic, subjects of recent tonsillectomy are slightly more liable than those not operated upon to contract the disease, and the proportion who develop the bulbar type is abnormally high. These observations support the view that tonsillectomy should not be performed during the summer months if cases of poliomyelitis are being notified in the neighbourhood.—Dowe, J. B. (1950). *Med. J. Aust.*, 2, 241. Dunn, R. E. (1950). *Med. J. Aust.*, 2, 243.—*Medical World*.

Malignant tumours of bone.—(*Ann. Surgery*, Nov. 1950).

Bone sarcoma has one main difference from other malignant lesions in that it most often affects relatively young persons. Its highest incidence is among persons of 15 to 20 years of age. Plans for cancer detection must therefore include this age group particularly, if persons suffering from malignant tumours of bone are to benefit under any mass tumour detection programme. Mayo Clinic statistics recently compiled by Jackson and Meyerding show that in 75% of cases osteogenic sarcoma occurs about the knee. This localization to the lower end of the femur and the upper end of tibia and fibula in three fourths of all cases of osteogenic sarcoma is significant. Dr. Coventry considers that trauma occurring so frequently about

the knee is a definite inciting factor in the production of certain malignant bone tumours.

Misuse of antibiotics in the otitis media.—*M. Med. Ass. Jour.*, 41, 385, 1951).

Dr. M. N. Flanders, Otolaryngologist of Maine, U.S.A., asserts that the disappearance of pain, fever and ear discharges in response to penicillin therapy during an attack of otitis media does not constitute a cure. The sterilization of exudate in the middle ear by penicillin therapy may prevent the complication of mastoiditis but complete resolution of the inflammatory changes that have taken place in the middle ear can be effected only by the escape of the fluid from the middle ear. A properly performed myringotomy done in the early stages of the acute otitis media accomplishes this. When myringotomy is not done the continuous presence of an exudate in the middle ear, even though it might be sterile, causes thickening of the membrane of the middle ear. The mobility of the ossicles and even of the ear-drum are greatly lessened. Ultimately some fibrosis develops beneath the membranes and the hearing acuity suffers a permanent reduction. The histological changes that occur are irreversible.

Changes in the scoliotic spine after fusion.—(*Jour. Bone and Joint Surgery*, Oct. 1950).

Ponseti and Friedman investigated 117 cases of scoliosis which were treated by spinal fusion, and found that the growth of the fused segment of the spine in young patients was either absent or only minimal except when pseudoarthrosis occurred. Pseudoarthrosis was common in the most mobile segments of the spine. When the entire lumbar section has been fused it was always present; after fusion of the thoracic section alone, it was not so commonly seen. Spontaneous closure of the pseudoarthrosis was often observed when the scoliosis became stabilized. In idiopathic thoracic, and thoraco-lumbar curve patterns short fusions of the main curve and one vertebra above and

below it gave the most satisfactory results. Increase of the scoliosis following the spine fusion was seen when the fused area was either too long or too short. In extensive fusions, increased scoliosis was associated with pseudoarthrosis bending of the graft, or the addition of more vertebrae to the curve. When fusion did not reach the ends of the curve, increase occurred above or below the fused segment. The authors found that the long-range findings on surgical fusion for scoliosis have been disappointing in many cases.

Acute cholecystitis.—(*Surg. Gynaecol. and Obst.*, Sep., 1950).

Ross and his colleagues review the results of their experience at Peter Bent Brigham Hospital with cases of acute cholecystitis. The resolution of the inflammatory process after an acute attack is exceedingly slow and incomplete irrespective of the clinical course of the patient's condition. After a short period devoted to the restoration of the fluid balance and the starting of antibiotic therapy, there is nothing to gain by delaying surgical treatment if the patient is doing well. The inflammatory process persists for months and sometimes for years after the clinical symptoms have subsided. The time spent in hospital is usually prolonged and the technical difficulties of surgery also increased.

On the other hand, if the patient is doing badly surgery is obviously mandatory and it is in such cases that simple cholecystectomy under local anaesthesia may be a life-saving procedure. Ross *et al* consider that the concept should be abandoned that there is any arbitrary cubical period during which surgery for acute cholecystitis is to be avoided.

Blind intestinal pouches resulting from lateral anastomosis.—(*Surgery*, May, 1951).

Heiferz and Senturia describe eight cases of blind intestinal pouches following lateral anastomosis. In five of these eight cases the symptoms were undoubtedly considered to be due to the blind pouch. In the other three, other lesions were present which might also account

for the symptoms. The symptoms fell into the general categories of perforation with peritonitis, intestinal obstruction, nutritional disturbances and anaemia. Heiferz and Senturia consider that careful roentgenological studies should be carried out on all patients of lateral anastomoses who suffer from symptoms such

as abdominal pain, distension, nausea, vomiting, diarrhoea, and nutritional disturbances. The need for surgery depends on the nature of the symptoms and technical considerations. The substitution of end to end anastomosis for the lateral type prevents the formation of blind pouches.

OBSTETRICS AND GYNÆCOLOGY

Posterior colpotomy: An aid in the diagnosis and treatment of ectopic pregnancy.—The observations reported in this paper were based upon the experience of the Obstetrical and Gynecological Staff of the Presbyterian Hospital in the diagnosis and treatment of 224 ectopic pregnancies during the years from January, 1920 to July, 1949.

The history is a greater aid in the diagnosis of a suspected ectopic pregnancy than are physical and laboratory findings. Any patient in the child-bearing age who gives a history of temporary amenorrhoea, disturbed bleeding, lower abdominal soreness, crampy or sharp pain, pain referred to the shoulder, or pain not infrequently related to the emptying of the bladder or bowel, and who may have had faintness or shock of varying degrees must be suspected of having an ectopic pregnancy. Disturbed bleeding and any combination of these symptoms should suggest ectopic pregnancy.

While in a small group of patients a fairly definite diagnosis of ectopic pregnancy can be made from the history, physical examination and laboratory findings, in most instances the suspicion of the presence of an ectopic pregnancy must be confirmed by surgical inspection of the site of pregnancy.

Draa and Baum stress the value and safety of the posterior colpotomy incision. The patient with a diagnosis of a suspected ectopic pregnancy was prepared for surgery. Under general anaesthesia the cervix was dilated and the uterus curetted to rule out a disturbed intrauterine pregnancy. If insufficient scrapings were obtained to make a diagnosis, the posterior cul-de-sac was opened. Upon the opening of the cul-

de-sac, the presence of fresh or old blood was noted. Then the tubes, ovaries, and uterus were inspected for the presence of disease. Inspection was facilitated by the use of the Heaney narrow-blade vaginal retractors and by grasping the posterior wall of the uterus with tenacula or uterine hooks so that the uterus could be manipulated to bring the adnexa into view. If the ectopic pregnancy was an early one, it was usually not only exposed without difficulty but was also removed without difficulty. Occasionally, fibrous adhesions would hold an early ectopic pregnancy against neighbouring structures. Not infrequently, these adhesions could be freed by gentle finger dissection, thereby securing mobility so that the ectopic pregnancy could be brought down to the incision and be removed.

The diagnosis was established for 149 of the 224 cases of ectopic pregnancy by the use of the posterior colpotomy incision. In 77, or 34.37 per cent of the 224 cases reported, the extra-uterine pregnancy was diagnosed and removed through the posterior colpotomy incision.

Ectopic pregnancies were removed by laparotomy 72 times after the suspicion of extrauterine pregnancy was positively confirmed by visualization through the posterior colpotomy incision. The ectopic pregnancies in this group were of longer duration. The posterior colpotomy incision will give a positive diagnosis and prevent delay in treatment of extra-uterine pregnancy and will also prevent unnecessary laparotomies. When a laparotomy is necessary to remove an ectopic pregnancy visualized through the colpotomy incision, there is no increased risk to the patient.

Although the posterior colpotomy incision is a simple, safe procedure for the diagnosis of ectopic pregnancy and, frequently, the incision allows ample space for removal of the pregnancy, it has been used by few surgeons and has even been condemned because of the danger of introducing infection into the peritoneal cavity. This has not been the experience of these authors.

(Draa, C. C. and Baum, H. C., *American Journal of Obstetrics and Gynecology*, 61:300-311 (Feb.), 1951. The authors are connected with the Departments of Obstetrics and Gynecology, Presbyterian Hospital of the City of Chicago and University of Illinois College of Medicine, Chicago, Illinois).—*Surgical Newsletter, U.S.I.S.*

The cause of breech presentation.—(*Am. Jour. Obst. and Gynaecol.*, July, 1950).

Dr. Charles S. Stevenson who has made an elaborate study of the subject, has shown that the placental position in the 'term' or 'near-term' uterus could be determined accurately in 98% cases. He carried out an investigation into the influence of placental implantation on breech presentation. Seventy six gravid women who had persistent breech presentation at term or near term were thus studied. It was observed that the *in-situ* placenta was implanted over one lateral fundal and tubal area of the uterine wall in all cases. Since the head of the foetus is smaller than the breech and legs, the head will tend to accommodate itself to the smaller pole of the amniotic sac ovoid, whilst the breech will tend to occupy the larger lower uterine segments of the sac. Thus, cornual implantation of the placenta as it indents and alters the shape of the amniotic sac, is considered by Stevenson to be the principal cause of breech presentation of the human foetus. The implantation site was verified at delivery or caesarean section in about 18% of cases by intra-uterine palpation of the *still-in-situ* placenta. Primiparity and right axial torsion of the uterus also play a major role in maintaining the persistence of breech presentation until term. Stevenson enunciates he

following new obstetric principle:—"The position of the implanted placenta in the near-term or full term human uterus as it indents and alters the ovoid shape of the amniotic sac determines the polarity of the sac independently of the fixed polarity of the containing uterus; functionally the foetus accommodates itself to the shape of the sac, the foetal head seeking the smaller pole; and thus the placental implantation site has a determining effect upon the presentation of the foetus."

Penicillin vaginal suppositories.—(*Am. J. Obst. Gynaecol.*, 60, 806, 1950).

Turner of St. Louis Hospital for women, reports on the effect of penicillin vaginal suppositories on morbidity in vaginal hysterectomy and on vaginal flora. A theobroma oil suppository containing 100,000 units of crystalline potassium penicillin G was inserted vaginally from 12 to 14 hours prior to operation in 100 consecutive non-selected vaginal hysterectomies. Only 7 of these 100 patients experienced post-operative febrile morbidity. By using identical pre-operative preparation *but excluding* the use of the penicillin vaginal suppository, 21 out of 56 vaginal hysterectomies developed fever after operation in one series and 73 out of 210 cases in another series of similar cases. Bacteriologic and clinical studies supported the author's belief that penicillin vaginal suppositories are of value in reducing morbidity when employed as an adjunct in pre-operative preparation for vaginal hysterectomy.

Anovulatory menstruation.—(*Am. J. Obst. Gynaecol.*, 60, pp. 790-796, Oct. 1950).

Wong *et al* obtained from 36 sterility patients of child bearing age, 47 endometrial biopsy specimens, which all proved to be anovulatory. 28 of the patients were nulliparous. The duration of sterility was from one to 9 years. 13 of the 36 patients had a normal menstrual history while the other 22 gave histories of oligomenorrhoea or secondary amenorrhoea. Only one of these had menorrhagia. The number of anovulatory cycles in the 36 patients varied from one to five. Nineteen patients were

anovulatory continuously while under observation for several months to a year whereas the other 17 were periodically so. Four of these 17 subsequently be-

came pregnant. The overall clinical picture of these 33 patients showed a fairly constant correlation between obesity, mild hirsutism, and anovulation.

MEDICINE AND THERAPEUTICS

Suppurative thrombophlebitis treated with aureomycin.—(*Br. Med. Jour.*, 13, Jan. 1951, pp. 72-73).

Of the various types of thrombophlebitis, the infections and suppurative cases form only 3 per cent. They are often fatal owing to development of pyæmia and metastatic foci. Jackson of the Birmingham Accident Hospital, records a case of ilio-femoral thrombophlebitis in which the prognosis was grave and became worse by the infecting staphylo-aureus turning penicillin-resistant, the chemotherapy was discontinued too early and ultimately a successful recovery was nevertheless obtained with aureomycin, without vein ligation proximal to the thrombus.

The suppurative ilio-femoral thrombophlebitis arose from a transfusion incision infected with penicillin-resistant staphylococcus aureus. The patient was a child aged 3 years who fell into a bath of hot water and received scalds on his back, thighs, and left arm. The extent of the scalded area was 24 per cent of the body surface and 2% being whole skin loss. On the sixth day after admission the child's Hb. was 69% and a blood transfusion was made after cutting down on the right great saphenous vein at the ankle. Four days later his temperature rose to 105 F. and the pulse to 160. Systemic penicillin was given 6 hourly; sulphadimidine was also given orally. On the 13th day a small abscess was incised over the upper end of the tibia and the pus gave a pure growth of a penicillin-resistant staph. aureus. On the 21st day an operation was performed and the saphenous vein and its tributaries were collapsed and empty but the femoral vein was thrombosed. It was opened. After taking material for a culture the femoral vein was tied but the thrombus was palpable at least 1 inch proximal to the ligature. Aureomycin was given but stopped

early; so there were two recurrences, but after 125 mg. had been given 6 hourly for 28 days (total 14,000 mg.) the condition was finally cured.

Mild hypothyroidism: A common disease.—Christman says that of the many patients who consult physicians complaining of fatigue a relatively small number have cardio-renal disease, anaemia, diabetes, tuberculosis, or Addison's disease as a basis for this complaint. In many instances life situations are a little too difficult. Sometimes the fatigue can be accounted for by poor habits of living, or a schedule of activities which leaves no leisure.

The author stresses that many of these people who are tired show some signs of symptoms of hypothyroidism, and laboratory data and response to desiccated thyroid confirm this diagnosis in many instances. He reviews observations on 138 patients who had symptoms of hypothyroidism and who were found among 1,000 consecutive unselected case histories of patients seen in the surgery during a period of a little less than four years. The most frequent clinical signs of hypothyroidism in these patients were: a lowered basal metabolic rate, an elevated serum cholesterol and response to thyroid therapy.

It is important to differentiate hypometabolism from hypothyroidism, because hypometabolism is not benefited by desiccated thyroid and a low basal metabolic rate may occur in healthy persons as well as in Addison's disease, Simmond's disease, starvation, nephrosis, sometimes in diabetes; it is also found at times in undernourished persons. The determination of the serum cholesterol content may help to distinguish this group when the differential diagnosis is not obvious; a therapeutic trial with thyroid is also helpful in

differentiation. In the series of 1,000 patients 20 were found who had a low basal metabolic rate but did not have hypothyroidism.

The 138 patients with hypothyroidism included 79 parous, and 33 nulliparous, women and 26 men. The author believes that child-bearing and menstruation might both be factors contributing to the higher incidence of hypothyroidism in females.

Fatigue was a symptom in all of the patients with hyperthyroidism and 41 per cent of all patients complaining of fatigue were found to have hypothyroidism.

Dry skin and hair, brittle nails, poor cold tolerance, dyspnoea, oedema, hypotension, early atherosclerosis, constipation, vaginal discharge, sterility, miscarriage, dysmenorrhoea, menstrual irregularities, impotence, headache, muscle and joint pains, and stiffness, and macrocytic or hypochromic anaemia were less common. Blood cholesterol was consistently elevated.—Christman H. E. Lakeswood. (1950). *Ohio State Medical Journal*, 46, 965-970.—*Medical World*.

Hormones of digestive tract.—(*Nature*, Vol. 166, pp. 714-715, 1950).

Popular interest in the control of digestive functions has centred on the Russian physiologist Pavlov's demonstration of the reflexes, both conditioned and unconditioned, which play a very important part in the regulation of the salivary and gastric secretions. The discovery of 'secretin' by Prof. Brocklehurst was an eventful one as it was the very first clear demonstration of the liberation of a chemical substance from an organ of the body into the blood stream and its specific action on another organ. From this discovery, in fact, sprang much of the work on hormones of all kinds. Prof. Brocklehurst surveyed at a recent meeting of the British Physiologists at Birmingham, the great volume of research work during the last 50 years, which has established the existence of the hormones:—'Gastrin' which stimulates acid secretion by the stomach, 'secretin'—the corresponding stimulant of the pancreas and 'cholecystokinin' which brings about contraction of the

gall-bladder. There is evidence, too, that gastric activity, both secretory and motor, may be inhibited by the release of a hormone—'enterogastrone' from the small intestine. Secretin and gastrin have no stimulant action on the output of enzymes in the gastric and pancreatic juices. Recent work has been concerned with the action of these substances in the human subject and with the mode of their release during normal digestion. Three substances—secretin, pancreozymin and cholecystokinin have so far been prepared in a form sufficiently pure for intravenous injections in man. It has been claimed that the examination of the duodenal contents after secretin is of value in the diagnosis of malignant or chronic inflammatory lesions of the pancreas.

There has been increasing interest in recent years in the mechanism of the release of the digestive hormones. In an interesting discussion of the activities of the intestinal mucosa Dr. R. B. Fisher stressed the very high metabolic rate of the mucosa, which in animal experiments, was found to be completely replaced every 36 hours. He considers that the mucosa builds up peptides from absorbed digestion products of protein and it is known that the hormones are also peptide in nature. The presence of peptones in the gut leads to a building up of proteins in the mucosa and the application of injurious agents such as acid to the mucosa leads to the breakdown of cytoplasmic protein. These substances are known to bring about a release of the hormones from the intestine and so the hormones may be normal products of the breakdown of the mucosal cytoplasm.

Time action of globin insulin.—(*Arch. Int. Med.*, 86, 2, 178-188, 1950).

For fully ten years, it has become increasingly apparent that the sustained weak action of the oldest of the depot insulins (protamine zinc insulin) is too slow and uncertain for the best control of severe forms of diabetes mellitus. The advantage of prolonged effect is also its chief fault, because its action after a morning injection has been so weak that patients with severe diabetes excrete large amounts of sugar after

even an ordinary meal. If dose is increased, insulin shock often results. In milder forms it has been very satisfactory because details of insulin timing then are unimportant. A third type of insulin, therefore, has been developed for use in severe diabetes. It is the "Intermediate" insulin as its effects are about midway on the average, in speed, intensity and duration. Intermediate insulin preparations have now come into widespread use in severe diabetes because of their greater efficiency and convenience. Three specific preparations with intermediate action have been studied and used extensively in U.S.A. Colwell and his co-workers of the Wesley Memorial Hospital in Chicago, report on a comparative study they made and give the results obtained by them after confirmation by clinical application. The three intermediate insulins used are:—

(1) *Globin insulin with zinc*:—(It is an insulin compound with beef globin and zinc which is in slightly acid solution rather than in suspension, as the other intermediate insulins are). It depends for its intermediate action on a combination of rapid and slow absorption due to the fact that it is partially precipitated on neutralization by tissue fluids after subcutaneous injection.

(2) *Crystalline protamine insulin*:—(NPC 50 or NPH 50) is a recrystallized form of protamine insulin containing 40 per cent as much protamine as the commercial preparation, slightly more than the commonly used 2:1 mixture (see No. 3 below). It is a neutral suspension of uniform crystals, stable enough for clinical use and fairly constant in protamine content.

(3) *Insulin and protamine zinc insulin mixtures*:—The most commonly used mixture is undoubtedly the "2:1 mixture" made extemporaneously by mixing thoroughly (in the syringe or in an empty ampoule) twice as much regular or crystalline insulin as protamine zinc insulin both in the 80 unit concentration.

The conclusions reached by them as a result of this controlled study are as under—

Globin insulin with zinc, crystalline protamine insulin (NPC 50 or NPH 50)

and a mixture of (2:1) regular insulin and protamine zinc insulin are all intermediate in rapidity, intensity and duration of action between ordinary insulin in solution and standard protamine zinc insulin. All three are superior to the ordinary insulin and protamine zinc insulin in the routine treatment of patients with severe diabetes by injection once daily before breakfast. The preparation which most closely fits the eating and fasting requirements of the individual patient in the smallest dosage should be determined and fixed in each case by trial.

Treatment of endocarditis.—

Antibiotic treatment was given to 11 patients with subacute bacterial endocarditis. All patients were treated with aureomycin or chloramphenicol (chloromycetin), either initially or after other antibiotics had failed to control the infection. The dose depended on the sensitivity in vitro of the infecting organism. The average dose of aureomycin was 0.5 to 1 gm., and of chloramphenicol 1 gm., both given orally every six hours. In two patients who could not tolerate the oral route aureomycin was administered intravenously. In three patients, treatment with chloramphenicol was initiated with a priming dose of 1 gm. every hour for four doses. The duration of treatment, which varied with each patient, was from eight to 35 days. In two of eight patients treated with aureomycin, the infection was considered to have been controlled by this drug. In both patients the blood cultures became negative on the day following the institution of therapy. The infecting organisms in both patients were very sensitive strains of *Streptococcus viridans*. In these two patients the follow-up period was 11 and 12 mo. and there was no relapse. Aureomycin failed in the remaining six patients, in three of whom *Str. faecalis* was the infecting organism. Two of these patients were subsequently cured by large doses of penicillin. Chloramphenicol was used in five patients. A definite cure was effected in only one patient. Blood cultures became negative within 24 hr. after institution of therapy, which

lasted 35 days. This patient was followed for five months after discontinuation of the drug, and there was no evidence of relapse. All patients treated with aureomycin had gastrointestinal symptoms, including anorexia, nausea, vomiting, or diarrhoea. In general, chloramphenicol was more readily tolerated than aureomycin. Only one patient complained of nausea, and in two a mild maculopapular rash developed. Aureomycin and chloramphenicol may effect a bacteriologic cure in certain cases of subacute bacterial endocarditis due to a sensitive organism. An organism found to be sensitive to aureomycin and chloramphenicol in vitro will not necessarily respond in vivo. In the small series of patients reported on, aureomycin and chloromycetin were not effective when penicillin had previously failed, but penicillin was effective when these antibiotics did not control the infection. Patients had better symptomatic results with penicillin. Results indicate that penicillin is the antibiotic of choice in the therapy of subacute bacterial endocarditis due to *Str. viridans* and *Str. faecalis*. If large doses of penicillin or the combination of penicillin and streptomycin prove ineffective, aureomycin or chloramphenicol should be tried if in vitro studies are favorable.—(*Journal of the American Medical Association*).

Chemotherapy in cholera.—*Br. Med. Jour.*, 10-3-51, pp. 500-504, and editorial.

Dr. S.C. Lahiri of the National Medical Institute of India, records the result of his carefully controlled observations of 317 cases of cholera from May to July 1950, using sulphaguanidine, formosulphathiazole, and formosulphacetamide. The cases were those admitted to the cholera ward of the Chittaranjan Hospital, Calcutta, during the epidemic of 1950. The three drugs were given orally to successive patients in cyclic order according to their admission into the ward, the fourth one admitted received no chemotherapeutic drug and served as control. The dosage was the same for all three drugs. 4 g. initially followed by 2 g. every 4 hours, throughout day and

night, till symptoms subsided or stool became vibrio free—children received proportionately lower doses. All patients received saline transfusion (hypertonic, isotonic and alkaline) till then sp. gr. of blood came to normal level. Atropine sulphate 1/100 grain hypodermically was given on admission to adults and repeated after 12 hours if necessary. All received glucose intravenously either in 25% solution (50 c.c. every 8 hours) or with normal saline in 5% solution as transfusion.

Results:—The effects of the three drugs (in the order given above) and of the control were studied in 72, 64, 61 and 71 patients respectively; the respective case mortality rates being 31%, 34%, 34%, and 18%. The three drugs given orally did not reduce the mortality rate in cholera patients and the results in these cases compared unfavourably with those in cases where no chemotherapy was given. These results of Dr. Lahiri are quite different to those obtained by Dr. Bhatnagar, who used a chemotherapeutic drug—a molecular combination of sulphathiazole and formaldehyde—and reported 82 recoveries among 85 patients 57 of whom were semicomatose with imperceptible pulse anuria and marked dehydration. Chopra's experience with sulphanilylguanidine in cholera was also in favour of the drug (with a mortality rate of 5.5% against 6.9% among controls).

Lahiri has shown now that chemotherapy does not materially accelerate the disappearance of the cholera vibrios, whereas it may be detrimental to the patient in other ways. Chemotherapy in the treatment of cholera is not therefore recommended in preference to the time honoured saline injections and transfusions.

Relief of prickly heat with vitamin C.—(*J.A.M.A.*, 145, 3, 1951, p. 175).

Stern records his experience of treating severe cases of prickly heat with large doses of vitamin C successfully. In none of his cases was there evidence of clinical ascorbic acid deficiency. 300-500 mg. daily of crystalline vitamin C in tablet form gave dramatic relief to nearly all the patients. The itching cleared and the rash subsided usually

within half an hour, and the effects lasted from six to 24 hours. During the summer of 1950, Dr. Ralph E. Pawley and Dr. C. A. Berry of California administered 500 mg. a day orally to adults and 100 mg. to infants, who suffered severely from prickly heat in a desert region. Itching was promptly relieved and the rash cleared. None of these patients exhibited any signs of clinical vitamin C deficiency. [As no mention of this use of vitamin C could be found in the literature, this note by Dr. Robert, L. Stern of Beverley Hills, California, is of real therapeutic importance.]

Air travel and the cardiac patient.—(*Amer. Heart Jour.*, 40, 363-9, 1951). According to Dr. S. H. May of St. Louis, physiological, experimental and empirical data exist, that suggest the existence of a factor in the human body which increases the tolerance to oxygen want in the aged and in those with cardiac disease. He presents three case histories to illustrate that patients with heart ailments tolerate air travel quite well and that there can be no valid objection to travel in modern air vehicles for patients with heart disease. May's arguments are:—The altered adjustor mechanism of the carotid and aortic nerve structures almost certainly plays an important role in the emergency of oxygen want. Some of the mechanisms which participate in the adjustment of the body to high altitude, besides the well known acclimatization by polycythemia to altitude, are increased cardiac output and vital capacity, a slight shift of the pH of the blood and an increased capacity of the blood to fix and utilise oxygen. There is also evidence that the coronary vessels dilate. The collective experience of the Air Lines as well as the results of the crucial experiments of air evacuation of the sick and wounded from combat zones to base hospitals during the last war corroborate May's views.

Chloramphenicol in trachoma.—(*Am. Jour. Trop. Med.*, 30, 677-683, 1950).—Pijoan and his co-workers report on their successful use of chloromycetin in trachoma characterized by acute onset of conj. inflammation, dense infiltration and papillary hypertrophy. 8 children and 6 adults were treated. The antibiotic was administered orally 3 gm. being given in divided doses at 3 hourly intervals for first 24 hours after which 250 mg. were given every 3 hours for at least 4 days. Considerable improvement (photophobia and lacrimation greatly reduced) resulted in 24 hours. In the next 4 days there was an 85% improvement in opacities and inflammation. Eyes were protected from dust and wind. The authors followed up the cases for 3 months and no relapse was found in any case.

The neurotoxic effects of dihydrostreptomycin.—(*Med. Jour. Australia*, Vol. 1, No. 5, 1951, p. 199).—Dihydrostreptomycin (produced by the catalytic hydrogenation of streptomycin) was introduced as a substitute for streptomycin in the hope that the well known neurotoxic effects of that drug may be avoided. It has however been found that this new drug is not entirely free of neurotoxicity and that its use may be followed by impairment of the vestibular function, deafness or both. Carr *et al* of the Mayo Clinic (*J. A. M. A.*, 5-8-1950) have reviewed all the cases treated with dihydrostreptomycin which was followed by neurotoxic changes. They present case histories of ten patients and point out that in nine of the ten cases the data suggest that the neurotoxic reactions were attributable to the presence of too great a concentration of dihydrostreptomycin in the blood rather than to any idiosyncrasy to the drug; the maximal concentration attained was greater than 80 microgrammes per cc. Carr *et al* found that one gramme of dihydrostreptomycin given every 12 hours is a safe dose for an adult who weighs 50 to 70 kilogrammes and whose renal function is normal. They also found that the maximal concentration of dihydrostreptomycin in the blood serum was not always directly proportional to the daily dose per kg. of body weight and that the total daily dose need not therefore be absolutely proportional to the body weight. From the available evidence admittedly still incomplete there is no reason to differentiate between the 2 drugs in their therapeutic efficiency or in their effect in the auditory function of the eighth nerve: there is equal danger with both drugs in the presence of impaired renal function. The important point that appears to be accepted in present experience and evidence is that larger doses of dihydrostreptomycin may be given than of streptomycin with less risk of toxic effects on the vestibular function of the eighth cranial nerve.

Aureomycin and chloramphenicol in Herpes Zoster.—Forty-four patients with herpes zoster were divided for treatment in four groups of 11 patients each. The first group of patients served as controls and was given dextrose. The second group was given 2 gm. of aureomycin daily for six days. The third group received 4 gm. of aureomycin daily for 4 days. The fourth group was given 2 gm. of chloramphenicol (chloromycetin) daily for six days. The controls were selected at random, and the observers did not know which patients were in this group. No significant difference was found between the groups in respect to amount and duration of herpetic pain, paraesthesiae, or the appearance of new herpetic lesions. Treatment with either aureomycin or chloramphenicol within the first week of the rash shortened the pustular stage so that desquamation was earlier and scarring less. All the patients treated with aureomycin and all but two of those treated with chloramphenicol were free from secondary infection, which was present

in all the controls. The effect of the antibiotics thus can reasonably be attributed to their action on the secondary infection. Two patients with dramatic amelioration of symptoms have been reported on in detail; one was treated with aureomycin, and the other was a control. In view of these results, it seems that such expensive drugs should be employed only in very severe cases, particularly ophthalmic zoster, occurring in elderly or debilitated patients.—(*Journal of the American Medical Association*).

Effects of parenteral quinidine administration.—(*Arch. Internat. Med. A.M.A.*, 86, 917-934, 1951).

Blinder and his co-workers studied the effects of Quinidine lactate administered parenterally on 59 subjects, divided into 3 groups; 22 with normal hearts, 22 with cardiac arrhythmias and 15 with abnormal hearts (with regular sinus rhythm). Special note was made of all manifestations of clinical toxicity accompanying the injection of quinidine lactate. 0.65 gm. of quinidine lactate was administered parenterally to 37 subjects with regular sinus rhythm, 15 with known cardiac disease and 15 normal persons received the drug intramuscularly; 7 with normal hearts were given the drug intravenously.

The maximal cardiac response to a single intramuscular dose of 0.65 gm. of quinidine is obtained in $\frac{1}{2}$ to one hour and maintained at least 4 hours. It is no more toxic than quinidine given orally in similar doses. The time given orally has a peak effect is between 2 to 4 hours in normal hearts and at least 6 hours in those with abnormal hearts. At 24 hours in those with abnormal hearts a small but significant quinidine effect persists. Of the 22 subjects with cardiac arrhythmias 15 were restored to regular sinus rhythm by single or multiple parenteral doses of quinidine. Their observations suggest the following time schedule for intramuscular administration of quinidine.—when rapid therapeutic effect is important hourly administration is indicated; when less urgent the administration should be at intervals of 3 to 4 hours. The maximal effect of oral administration of quinidine in effect of oral administration occurs usually between auricular fibrillation occurs usually between 2 to 4 hours (*Am. Heart Jour.*, 35, 1948), whereas by the intramuscular route the maximal response occurred in between $\frac{1}{2}$ to 1 hour in their patients with auricular fibrillation, auricular flutter, supraventricular tachycardia and ventricular tachycardia.

Action of caffeine on hypertension.—(*Dents. Med. Woch.*, 75, p. 1067, 1950).—(From Author's Summary).

Caffeine is usually considered to be able to produce a general vasoconstriction and an increase in blood pressure. It however produces vasodilatation in the brain, heart and kidneys. Sebok of Stuttgart conducted controlled experiments to ascertain whether the hypertensive effect of caffeine was sufficiently great to merit the withholding of that drug

and of coffee from patients with hypertension. He administered 0.05 to 0.1 gm. ($\frac{1}{2}$ to 1½ grains) of caffeine to 31 patients with pronounced hypertension and found their systolic and diastolic blood pressures were lowered. The fall amounted to from 10 to 80 mm. of Hg. in the systolic pressure. Maximal decrease usually occurred from 40 to 50 minutes after the administration of the caffeine. In 21 of these patients the pressure did not return to the initial values two hours later.

Control subjects with normal B.P. showed, on administration of the same doses of caffeine, either a slight elevation in pressure or a reduction as in the hypertensive subjects.

These investigations and the fact that caffeine dilates the coronary vessels thereby improving the metabolism of the myocardium suggest that there is no justification for interdicting the use of either caffeine or coffee by patients with hypertension.

Renal phosphatic calculi.—(*J. A. M. A.*, 144, 1950).—The treatment usually employed in the management of phosphatic calculi is the acidification of the urine by means of acid ash diets, or acidifying agents. A new therapeutic regimen has been tried and found successful by Shore and Carter. 22 patients were given aluminium hydroxide gels along with a diet containing 1200 to 1300 mg. phosphorus and about 700 mg. calcium per day. The rationale for this regimen is "the formation of insoluble aluminium phosphatic salts in the intestinal tract and the corresponding reduction in the amount of phosphorus available for absorption."

Chloromycetin in ocular infections.—(*Arch. Ophthol.*, *A.M.A.*, 45, (Jan. 1951).—Chloramphenicol solution (2.5 mg. per cc. strength) has been found very successful in the local therapy of a variety of forms of conjunctivitis and dacryocystitis. Systematically and locally administered it was useful in keratitis but not in uveitis. Introcular infections cleared up with its use in 3 cases. 15 patients with herpes zoster ophthalmicus did well with chloromycetin systemically. It was found to penetrate into the intraocular fluid of the eyes.

Treatment of bacillary dysentery.—(*Lancet*, 259, 1950, p. 865).—Sulphonamides have been used since 1910. Sulphaguanidine and succinylsulphathiazole both relatively poorly absorbed, were the drugs of choice at first. In 1948 Hardy proved that sulphadiazine, being more readily absorbed, was the most effective against shiga infection. Sonne dysentery also yielded well to the sulphonamides; unfortunately treatment of dysentery with sulphonamides was not quite straightforward. In some infants and children, dehydration may have so far advanced that sulphonamides may prove dangerous, until dehydration has been corrected. Occasionally severe hypersensitivity, specific idiosyncrasy to sulpha drugs may bar their use. In such

cases and also where sulphonamides fail, recent clinical trials by Mazursky (*J. Paediat.*, 1950) and Ross *et al* (*J.A.M.*, 1950) have shown that chloromycetin by mouth yields as good if not even better results than sulphonamides or streptomycin.

Limitations to modern diagnostic aids—
(Foot-note in *Br. Med. Jour.*, 3 3 1951, p. 456.)

Recent contributions to the Scandinavian medical press give expression to a quite lively dissatisfaction with the multiplicity, complexity, and cost of laboratory and other tests now in vogue in many hospitals. Dr. Lennart Norrlin of Stockholm, in *Svenska Lokartidningen* of 8-12-1950, p. 243, (the organ of the Swedish Medical Association) has nothing good to say of radiological examinations in cases of acute gastric or duodenal perforation. He refers to cases in which a radiologist's report has induced him to undertake an exploratory laparotomy, though its hopelessness has seemed obvious to him from the outset. Proper exercise of the five senses is, in his opinion, to be preferred to laboratory reports; and the hospital chief who delays his first attendance on a newly admitted case by several days in order to equip himself with a handful of laboratory reports is *no model for his juniors*. Referring to the prodigality with which radiologists dispense their skiagrams, Dr. Norrlin mentions a case in which a relatively simple fracture of the leg below the knee was illustrated by 17 skiagrams of which 15 were superfluous. In a more general approach to the subject Dr. Ole Jacob Broch of the Oslo General Hospital in *Tidsskrift for den Norske Lægeforening*, of 15-11-1950, page 723, queries the usefulness of many of the fashionable radiological and laboratory tests. He points out that in elderly folk there are always radiologically demonstrable changes in the spine but that to hold them responsible for all or many of the patient's

symptoms, may be wide of the mark. In 1949 Roentgen diagnosis cost the health insurance funds in Oslo fully 14% of all the doctor's charges. As for electrocardiograms Dr. Broch suggests that watching the effect on a patient of walking upstairs may be much more instructive and diagnostic.

An overdose of B. C. G. vaccine—(*Rev. Tubercul.*, March-April, 1951).

Sair and Cheve describe the sequel to the vaccination of a newly born infant with B.C.G. by a midwife who drew up the entire quantity in an ampoule of B.C.G. vaccine, into a syringe and injected it intramuscularly into the buttock of the baby. A large cold abscess developed in the buttock and the infant did not suffer any constitutional disturbance. The abscess was aspirated and a Seton inserted and healing occurred in eleven weeks. Later suppuration occurred in the inguinal lymph glands but this also healed up under treatment in five weeks.

Subacute combined degeneration of the spinal cord—(*Brain*, Sep. 1950).

Dr. Ungley compares the effects of treatment of this condition by ordinary liver extracts with that of the red crystalline antipernicious anaemia factor (B12). Vitamin B₁₂ was found by him to be as effective as liver extract in the management of pernicious anaemia and subacute combined degeneration of the spinal cord. Ungley's work also excludes the necessity for postulating a distinct and separate neuropoietic factor. The pure extract has no special advantage over the usual liver extract, if the latter is known to be potent. He suggests a weekly dosage of 40 microgrammes of Vitamin B₁₂ as adequate for the first six months and then the dosage may be halved; with any signs of relapse or intercurrent infection the dosage should be increased.

Corrigenda

Page 791, Octr. 1951 issue of the 'ANTISEPTIC'. Please read line 20 as: "The activity of the antibiotic deteriorates rapidly in alkaline solution at the room temperature. The solution is yellowish in colour with a fluorescent tinge and a thin scum on the surface" instead of as published in the issue.

Page 795, Octr. 1951 issue of the 'ANTISEPTIC'. Please read the foot note as: "Sh. Sonne is from the stock culture" instead of "Sh. Shiga is from the stock culture."

In page 814, Octr. 1951 issue of the 'ANTISEPTIC' in the article "Effects of Regression and Progression of Evolution on Certain Human Structures." Please read the author's name as: "Dr. B. Singh, P.O.M.S., and N. Das, M.B., B.S. (Ph.), P.O.M.S., Anatomy Dept., Medical College, Amritsar" instead of as published.

Page 831, Octr. 1951 issue of the 'ANTISEPTIC' in the article "Some Notes on Malaria" please read in line 33, Resochin instead of Resoroin. Instead of *Anopheles fluviatilis* read *Anopheles Fluviatilis*.

In page 847, Oct. 1951 issue of the 'ANTISEPTIC' in the article "Paludrine Poisoning." Please read line 12 as: "Introduction of a tablet" instead of "Introduction a tablet."

Please read line 17 as: "It cannot be said that the sufferer does not get relief in many instances by following such treatment and advice" instead of as published. Instead of "Tablets," please read "Tablets."



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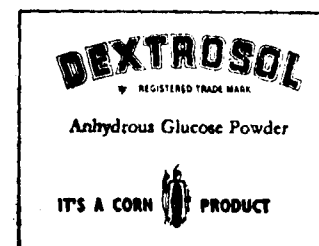
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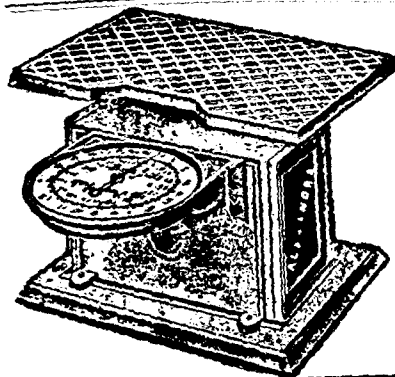
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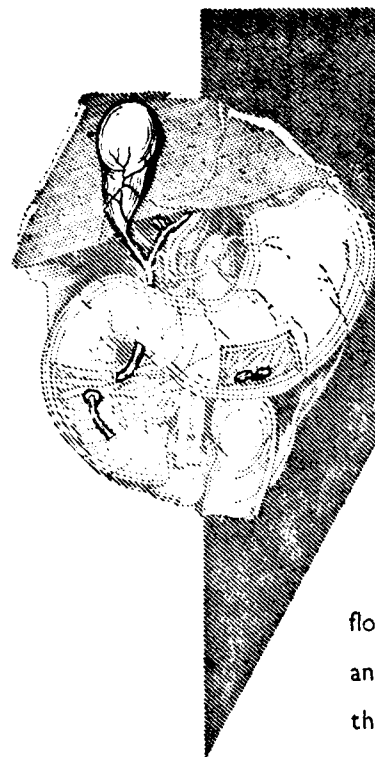
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MANIA—HYSTERIA—SCHIZOPHRENIA—
ANXIETY NEUROSIS—MELANCHOLIA.....

R/- Tablet **SILEDIN**

(SOME CLINICAL FINDINGS)

Case 1. MANIA

Care of Dr.....MD.

Sex—female Age-40. **Complaints:** Loss of temper-maniacal outbursts-loss of appetite. **Clinical Symptoms:** Insomnia, mania, rolling, abstinence of food, hostile attitude to every body particularly towards her daughter-in-law and mother-symptoms more marked in the presence of her husband. **Previous Treatment:** treated with Oestrogenic hormones and Phenobarbitons. **TREATMENT WITH SILEDIN:** Only SILEDIN has been given with good results. **Special Remarks:** Epilepsy and Hysterical element for many years.

Case 2. ADOLESCENT INSANITY—SCHIZOPHRENIA

Care of Dr.....MBBS.

Female, Age 30. **Occupation:** Home work. **Complaints:** (i) Somebody will take away my ornaments to sell them away (ii) I wish that my brothers and father should be ruined (iii) Somebody is going to break my house etc. **Clinical Symptoms:** (i) To sit silently and idle not to do any work (ii) no proper sleep (iii) a look of dum-idiot (iv) nothing abnormal was detected on physical exam-patient is a sterile-married life of 16 years. **Previous Treatments:** Nicotinic acid and injections and tablets in large doses for three weeks-no remarkable results. **Treatment with SILEDIN:** One tablet three times a day was given-with one bottle of fifty the mental condition was completely improved without leaving any trace of the former disorders-In all 100 tablets are given-patient has put up good amount of weight-looks very healthy and mentally-perfectly all right.

Case 3. ANXIETY NEUROSIS

Care of Dr.....LCPS, DPS, LM.

Sex: Female, Age 42—**Occupation:** Household work. **Complaints:** Afraid to come out of bed-thinks she is very weak-at times irrelevant in talk-anxious look. **Clinical Symptoms:** Anxiety Neurosis. **Other Reports:** General debility-poor nourishment. **Treatment with SILEDIN:** 2 tabs. twice a day for one month. **Remarks:** After four days treatment the facial look of anxiousness improved-after a week complete improvement. Treatment was however continued for one month.

Case 4. SCHIZOPHRENIA

Care of Dr.....LCPS.

Occupation: Male nurse in mental hospital. **Complaints:** Insomnia-fear as if Police is following-nearest and dearest appeared as enemies-suspicious as if he would be poisoned-blankness in head. **Clinical Symptoms:** Vacant face-dyspepsia-tender hepatic region. **Previous Treatments:** Electric shock Therapy-temporary improvements.

Treatment with SILEDIN: Has been taking SILEDIN and LEPTADEN for the last one month with definite improvement-no other treatment prescribed. **Remarks:** The patient says "there is great relief after taking medicine. I am taking regularly for the last 15 days. I am getting very good sleep. Indigestion is cured and get regular motions. Head remains very calm." After about two months he says: "I am feeling complete relief by the treatment".

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SILEDIN: 50, 100 500, Tablets. LEPTADEN: 56, 112, 500 Tablets

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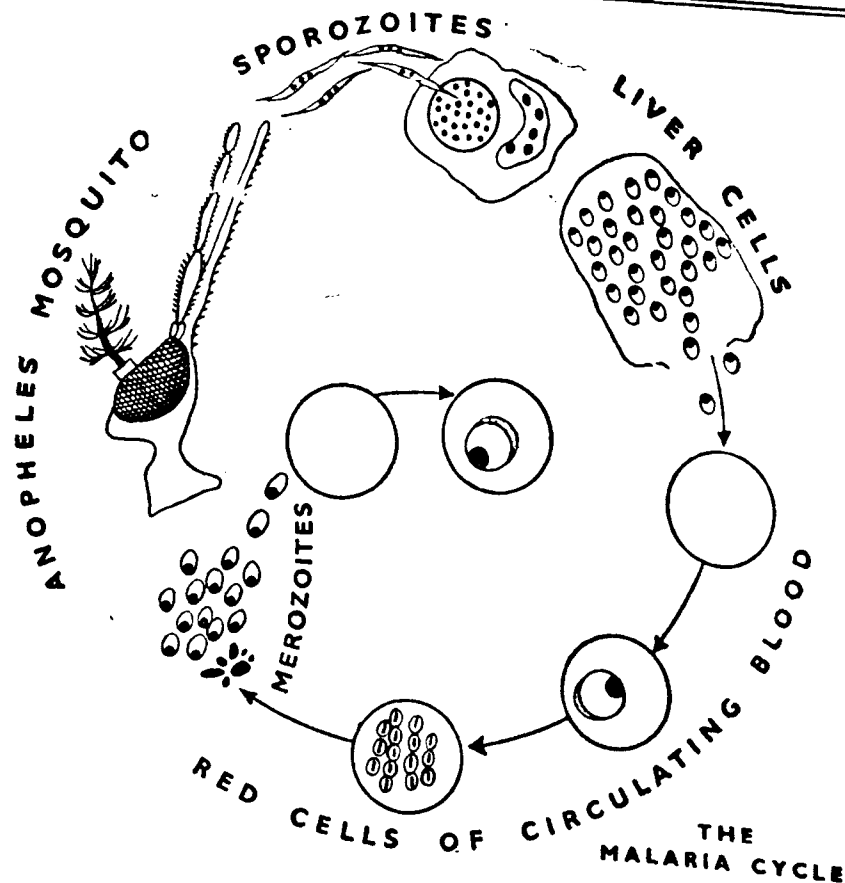
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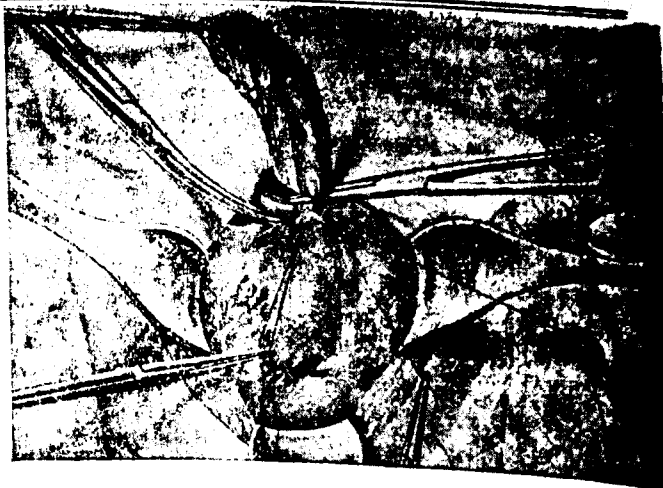
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" Oil 3 lacs x 10 cc. Pf. 11 Merck 10-0	Redoxan 6x2 cc. 5-4; 3x5cc 4-8; 25x5cc. 36-0
" B.W. 3 lacs x lcc 1-12; 4lacs x lcc. 2-4	Vit. B ₂ Roche (Befavin) 50x10 mg. 20-0 box
Penicillin Tab. Pf. 1/2 lac. x12 4-8; 1 lac. x12 9-8	Saridon tab. 10. 18-8; 250 32-8; Cytoserum 9-8
" Eye Oint 8-0; Skin 13-8; Lozenges 13-8 dz.	Vitamin B Tab. 500 USA. 1-8; Hemo " 9-8
Aureomycin 8 Caps. 21-0 [Lozenges 500 11-8	P.D. Chemequinine 3 tabs. 2-12; Entodan 12-0
Chloromycetin 12 28-12; Terramycin 16 38-8	Neosalvarsol 15 1-12; 3 2-6; 45 2-11; 6 3-2
Quinine Bengal 48-8; Java 57-0 Howds 58-0 lb.	Omnipon Amps. with Needles Comp. Tabs 1-0
" oz. Ind. 4-0; Howds 5-0; Bihydro oz. 8-8	B.W. Morphia Sulphate cum. Atropin 20x1/2 gr 5-0
Quinine Bihydro Amps. 100 x 10 grs. x 2cc.	P.D. " 20x1/2 gr. 3-8; Ind. 2-8
Ind. Alb. B.D.H. Evans B.W. P.D.	Vitamin K. Amps. B.W. 100 x 1 cc. 25-0
19-0 33-0 31-0 28-0 35-0 48-8	Chinifonum Eng. (Yatrin P.O.W.) 500grms. 15-0
" 100 x 5 grs x 1 cc. Ind. 14-0 BDH. 24-0	Aminophyllin Tab. B.W. 25 2-0; 100 6-0
Pamaquinine Tab. 300 1-2 [6; Gr. BI. 14-0	" Amps. 6 x 2 cc. 4-12; 6 x 10 cc. 6-0
Qu. Amps. Italy 15grs. x5x2cc. 1-2; 100 amps 20-0	Procain Hydrochlor 1% x3 cc. x 25 amp. 4-4
" 2 grs x 100 3-4 5 gr. x 100 B.W. 6-4	Distil Water 100 x 5cc. 7-0; 10 cc. 8-8; 2 cc. 5-8
" 5 gr x 1000 BDH 42-0 Howds 1400 60-0	Asparine Tab. 1000 Eng. 5-4; BDH. 6-8; Howd. 9-8
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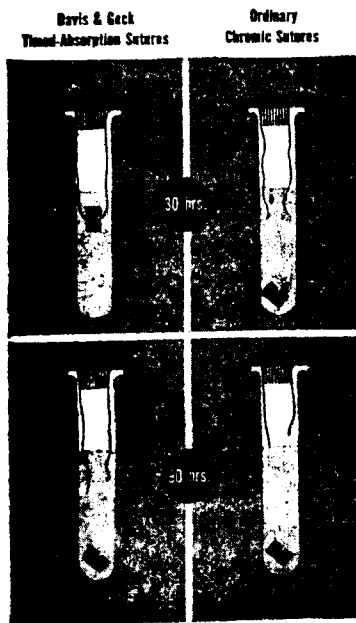
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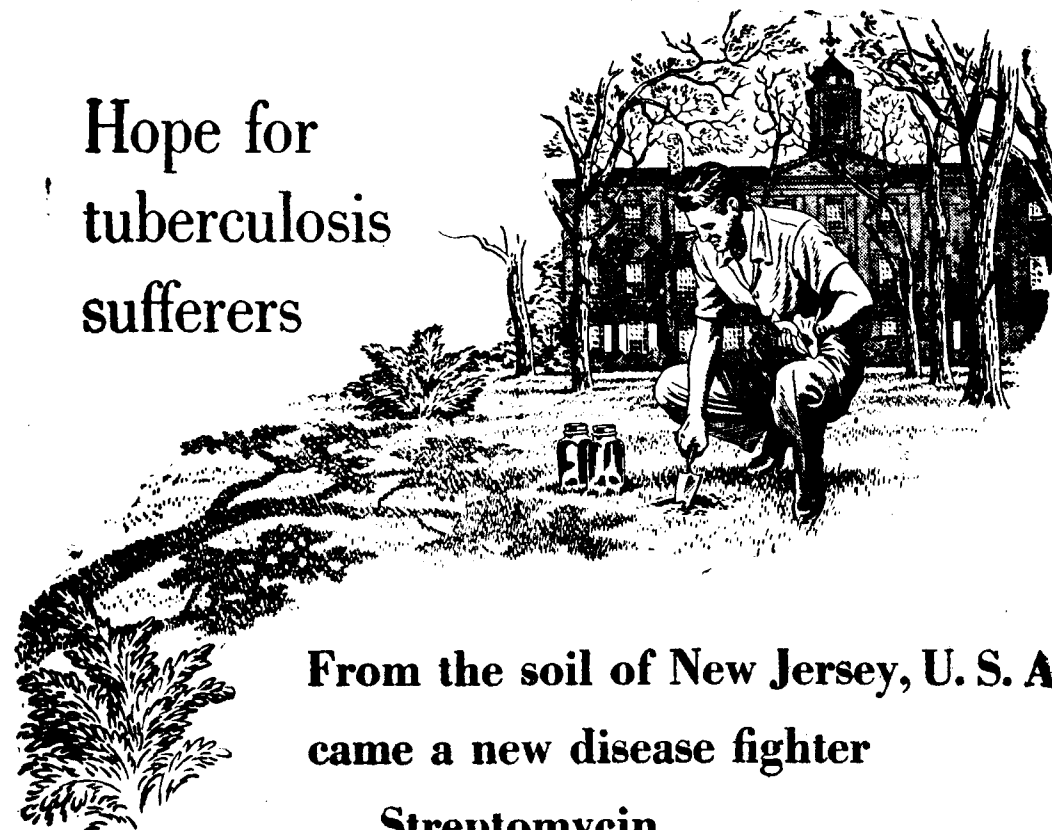
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3 lac x 1 cc. 1-12; 4 lac x 1 cc. 2-0	„ „ „ 50x5 cc. 9-0; Plain 5cc. 6-8	4-4
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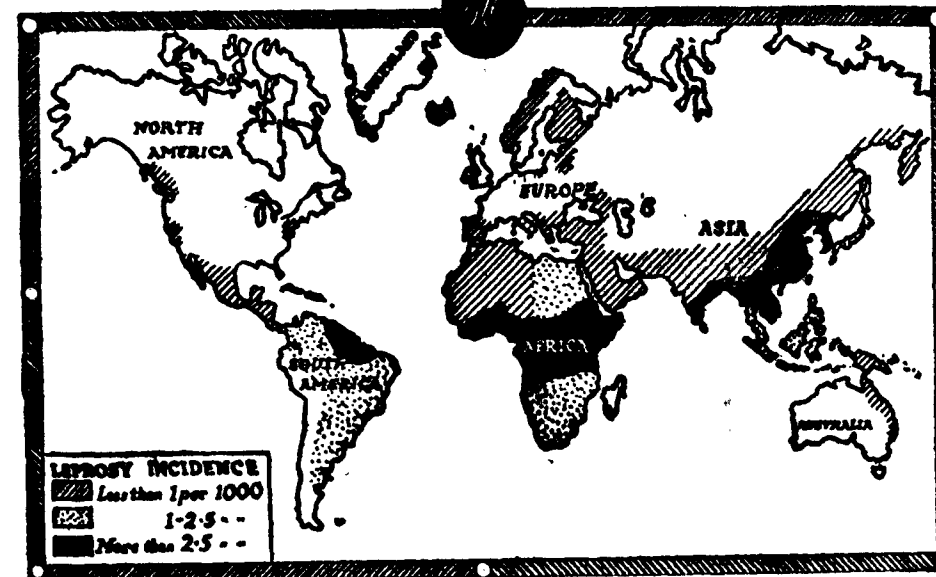
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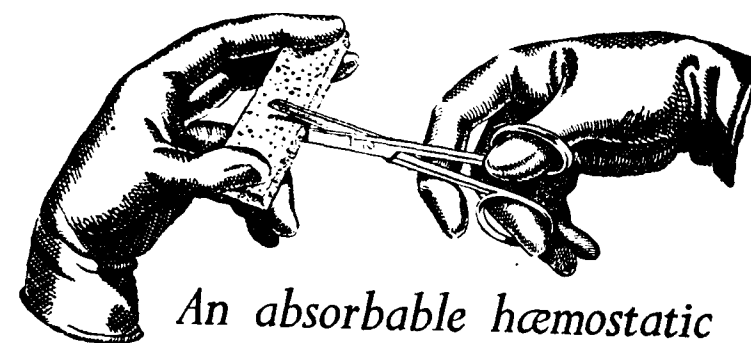
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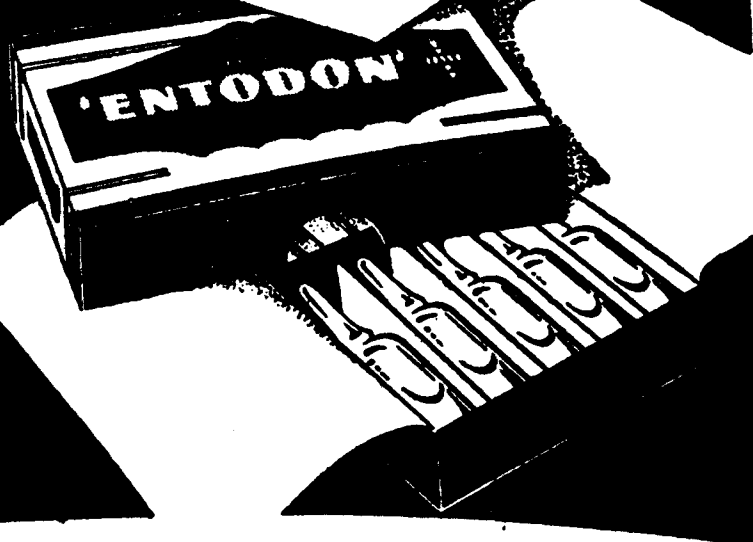
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Hypo Record Needle Japan or German doz. 2-8
„ All Glass „ Japan 3-8; German „ 4-0
Hemoglobin Scale Book each 3-0

Hypo. Syringe All Glass Nacket:—

C.N.:— 2c.c. 5c.c. 10c.c. 20c.c. 30c.c. 50c.c.
German 1-0 1-6 2-0 3-0 6-4 8-8 5
Italy 1-10 2-8 3-4 5-4 8-0 10-8
Japan 0-13 1-2 1-10 2-8 5-0 6-8

S.N.:—Rs. 1-0 More

Lactometer Zeal 3-0; Ind. 0-12; Ger. each 1-8
Lactopeptin Elixir sm. 28-8; lg. doz. 50-0

Lavandar Smelling Salt Eng. „ 13-8
Laxative Vegetable 100 1-8; 1000 tabs. bot. 13-4

Leukoplast Elastic 3x5 yds. 2-4; 2½x5 tin 2-0
Lilly's Gentian Violet Jelly 4oz. tube. 0-7

Lilly's Sulphanilamide Cream 4 oz. tube 0-7
Litmus Paper Book Assorted doz. 1-0

Lumbar Puncture Needle each 5-12
M. & B. 693, 100 tabs. 9-0; 500 tabs. tin 43-0

„ Neptal 6 x 1cc. 2-6; 6 x 2 cc. box 3-6
„ Acetylarsan 10x2cc. 4-12; 10x3cc. „ 7-0

„ Sulphatriad 25 2-5; 500 tabs. tin 44-0
„ Propamidine Jelly 1 lb. bot. 9-4

„ N.A.B. 15 1-2; 3 1-6; 45 1-9; 6gm. ea. 1-12
„ Soneryl 1½ gr. 25 1-4 500 tabs. tin 22-12

„ Stovarsol 4 gr. 30 2-8; 500 „ „ 39-0

M & B S.V.O. 25 2-8; 100 10-0; 500 tin 49-8

Menthol Crystal 1 oz. 5-0; Gynomin tabs. 1-14

Maclean Tooth Paste Giant doz. 18-0

Nicotannic Acid 0-5gm. 500 tabs. tin. 4-8

Oral Speculum Set of 3 set 7-8

Paludrin 1gm. 1000 tab. 27-8; 500 tab. 3gm. „ 26-0

Pamaquin 0-1 gm. 500 or 0-2 gm. 300 tabs bot. 1-2

Personal Weighing Machine Detecto each 42-8

P.D. Chloromycetin 12 Caps. bot. 29-12

„ Benadryl 50 cap. 6-0; Syrup 4 oz. bot. 3-8

„ Benadryl 10 cc. 6-6; Comber 10 cc. vial 7-0

„ Liver Ext. 2 USP 10cc. 4-8; 5 USP 10cc. „ 8-12

„ Emetin Hydro ½ gr x 1cc 6 amps box. 7-0

„ Dinaltin Sodium 100 caps bot. 6-0

„ Ferradol 2½ lb. 14-12; 1 lb. U.S.A. bot. 7-8

Penicillin Eye Oint. 0-11; Skin oint. tube 1-2

Penicillin Sodium Cryst. G.:—

Merck's 1 lac. 2 lac. 5 lac. 10 lac.

Pfizer's 0-12 0-13 1-8 2-10 vial.

Procaine Penicillin Aqueous:—

Pfizer's 4 lac. 1 cc. 3 lac. 1 cc.

3-0 2-12 vial

Quinacrin USA 100 1-0; 1000 tab. USA bot. 10-4

Quinine Sulph Govt. B.P. 48-8; Std. lb. 42-8

„ „ Roche 68-0; Java 58-0; How „ 69-0

„ „ Ind. 4-0; How 6-0; Bihydro oz. 9-4

„ Bihydro How 2 gr. 100 bot. 4-0

„ „ 5 gr. 100 tab. „ 8-0

„ „ Italy 15 gr. 2c.c. 5 amps. box 1-0

„ „ B.W. 10 gr. 12x2 c.c. 4-10; Evans „ 4-4

„ „ 5 gr. 1cc. 6 amps. B.D.H. „ 1-14

„ „ 5 gr. 1cc. 100 „ B.D.H. „ 24-0

Quinine Bihydro 10 gr. 2cc. 100 amps:—

B.D.H. Evans B.W. P.D. Ind.

Rs. 30-0; 26-8; 36-0; 51-0 19-8 box

Rubber Gloves "7½" or "8" USA per pair 1-0

Saline 100 tab. 1-8; D.A.D.P.S. 50 mgm. 100 tab. 1-4

Saline Apparatus 300 cc. 8-0; 500 c.c. each 11-0

Scissors 5" 2-0; Scalpel 5" „ 1-12

Sulphadiazine 25 3-0; 500 tab. bot. 48-0

Sulphanilamide U.S.A. 5gr. 1000 tab. „ 7-4

„ Eng. 7½ gr. 1000 12-0; 500 „ „ 6-8

Sulphathiazole Boots 500 tabs. tin 23-8

Suture Needles 0-4; Saline Needle each 1-14

Spatula Bolus 4" 0-14; 5" 1-2; 6" each 1-4

Spirit Lamp Glass 2 oz. 1-4; 4 oz. each 2-0

„ Metal 2 oz. 2-12; 4 oz. each 3-12

Silk Worm Gut 1-0; Horse Hair 100 Strand

Stomach Tube with Ball & Funnel U.S.A. „ 11-8

„ German „ 10-0

Stethoscope German B.D. Type „ 11-8

„ Rubber Tubing yd. 0-12

„ Plastic Tubing „ 2-0

T.C.F. Whole Liver Ext. 10 cc. vial 3-0

„ „ o Vit. B. Complex 10 c.c. „ 4-6

„ Vitamin B Complex 10 cc. 4-14

Tongue Spatula 1-8; Folding each 2-4

Tooth Forceps Universal 4-12; U.S.A. „ 6-12

Tuberculin Syringe Ideal each 9-8

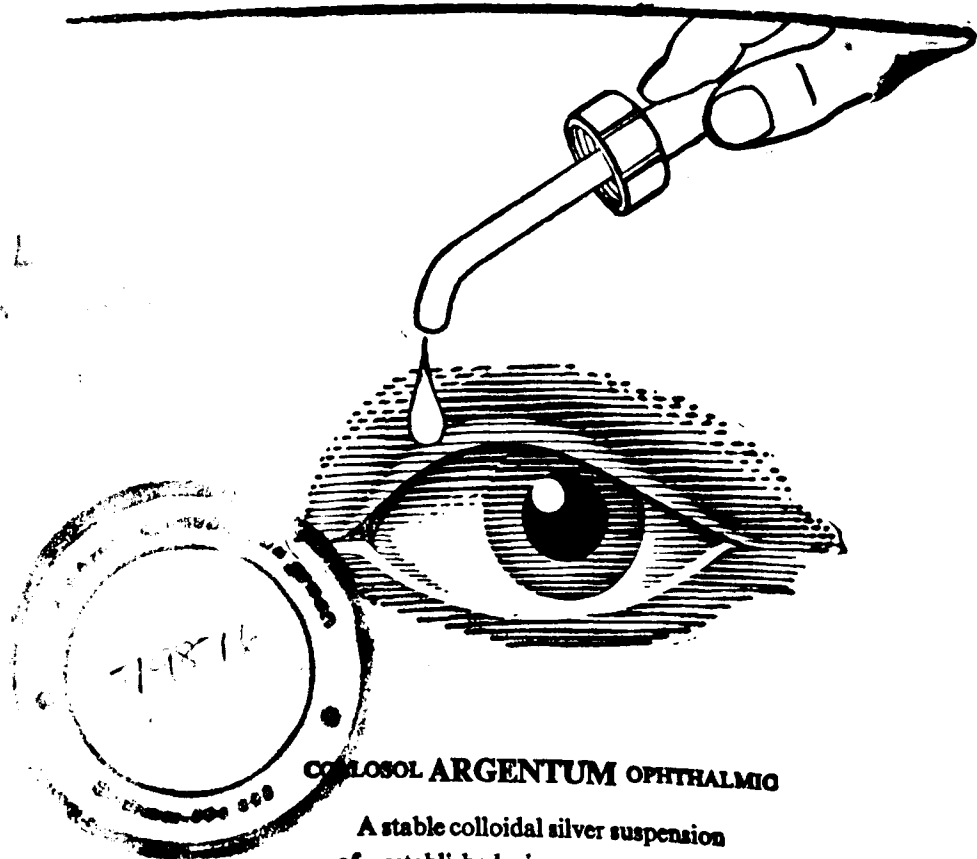
„ Syringe Japan 5-8; Insulin Syringe „ 7-8

Wisdom Tooth Brush Adult doz. 12-0

„ „ „ Junior „ 8-0

Yeast Eng. 100 tabs. 0-14; 1000 bot. 6-8

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