

648

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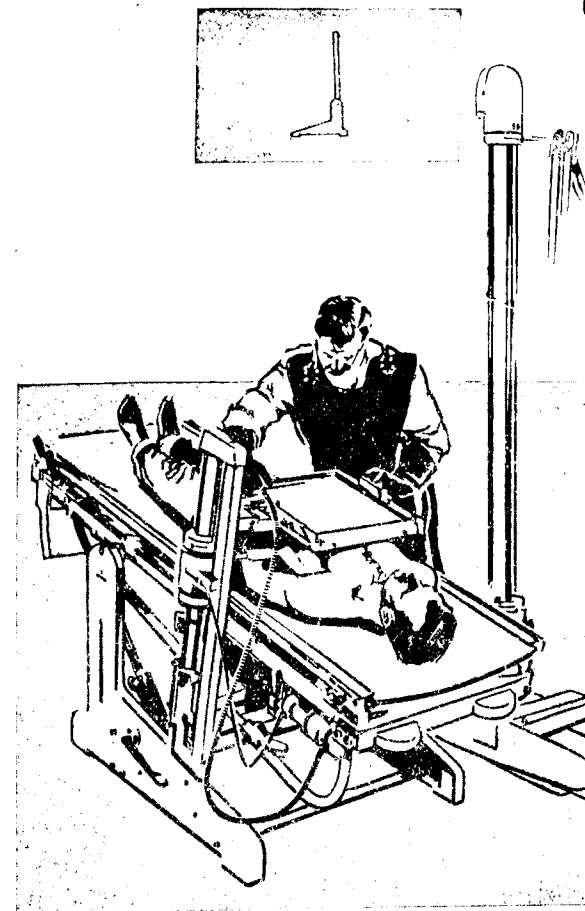
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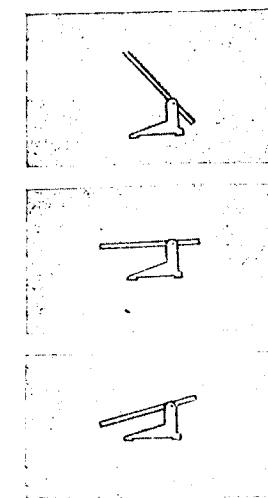
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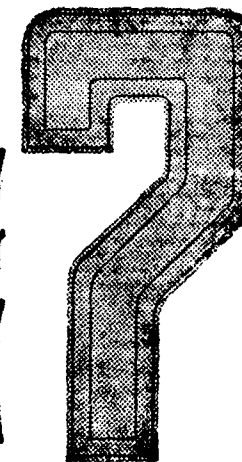
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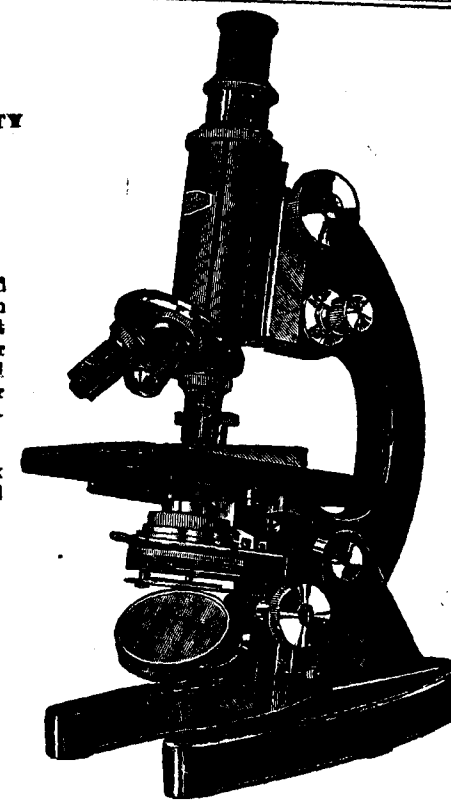
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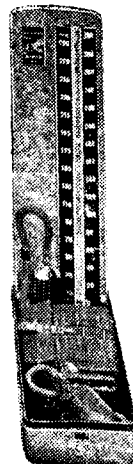
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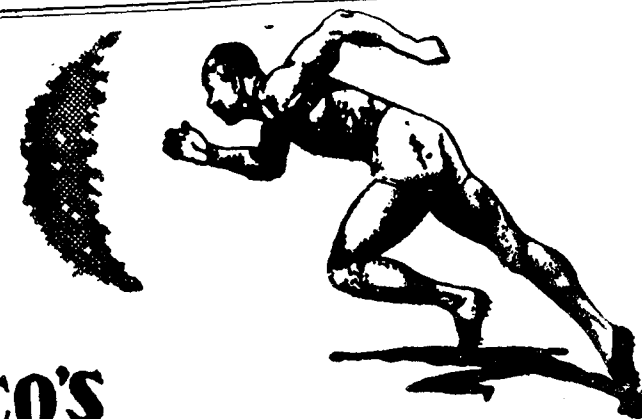
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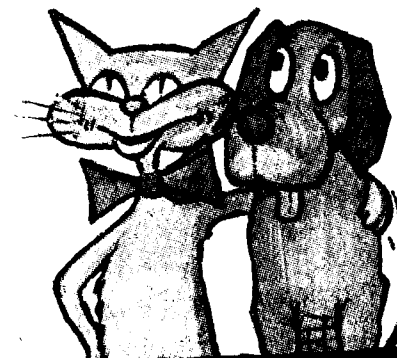
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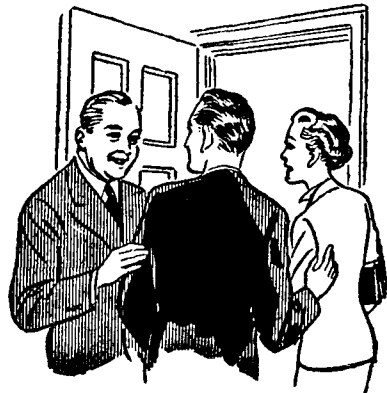
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The average weight of each tablet when packed is 1.2 grams and contains w/w: Sod. Bicarb. B.P. 12.2, Acid. Tart. B.P. 10.0, Toluene-p-Sulphonodichloroamide 1.1, Perfume q.s., Excipient to 100.

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Ephedrine, Lobelia, Hyoscyamus, Grindelia, Belladonna,
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Nicotinic Acid	40 mg.
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Extract Wild Cherry,
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WITH VITAMIN

500 mg.
in 10 c.c.**CALCIUM-C.B.I.**

- Quick assimilation
- Rapid deposition of Vitamin C in the cortex at the Adrenals
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Ampoules 5 c.c. 10 c.c.

Calcium Glucono-Glutamate	10%	10%
Vitamin C	100 mg. 200 mg.	250 mg. 500 mg.

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(Equivalent to 2 gm. fresh liver)

Stomach powder	10 mg.
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Panthenol	1 mg.
Folic Acid	2.5 mcg.
Vitamin B ₁₂	20 mcg.
Vitamin C	100 mg.
Ferrous Sulphate (Encapsulated)	5 mcg.
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Colloidal Calcium	... 0.5 mg.
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No inhalation, droppers, etc. required
SIMPLICITY OF MEDICATION PROLONGED ACTION WITHOUT ANY UNTOWARD SIDE EFFECTS. FREE FROM NARCOTICS, ANTIHISTAMINICS OR ANY HABIT-FORMING DRUGS.

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3.888 gms. Vib. Prunifol'm
1.296 " Pisc. Erythrina
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A palatable
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Rich in

Natural Hæmatinic principles, Vitamin B Complex factors and digestive enzymes of the freshly proteolysed Liver Yeast Extracts fortified by Synthetic Vitamin B Complex Factors, FOLIC ACID, VITAMIN B₁₂ and Lipotropic Factors Choline and Methionine.



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Palatable multivitamin preparation in malt base

Well indicated in periods of growth in children, during pregnancy and lactation, in old age and in states of malnutrition. Valuable as a Dietetic supplement and as a Tonic after operations and during convalescence.

Available in 1 lb. packing at all Chemists.

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Palatable hæmopoietic tonic

Contains liver extract, minerals and vitamins.
Useful in Anaemias

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VAGINAL TABLETS

the first safe antibiotic
effective against
fungi, particularly *Candida*
albicans (monilia)

notably effective in vaginal moniliasis

Mycostatin Vaginal Tablets are recommended for the treatment of all monilial infections of the vaginal tract and have been used successfully even in long-standing cases which have not responded to any other therapy do not disturb the normal bacterial flora of the vagina

Unlike other preparations used in vaginal moniliasis, Mycostatin Vaginal Tablets act solely against fungi and do not destroy the normal and useful bacteria which enhance the defense mechanisms of the vagina. Furthermore, because Mycostatin Vaginal Tablets contain lactose, the growth of the acidophilous (Döderlein's) bacilli is greatly stimulated. These bacilli, which thrive in the presence of lactose, are normal inhabitants of the vagina of adult women and act to prevent trichomoniasis. Vaginal trichomonads are rarely seen when there is a preponderance of growth of the acidophilous bacilli.

Each Mycostatin Vaginal Tablet contains 100,000 units of the antifungal antibiotic, nystatin, as well as 0.95 Gm. of lactose.

Administration: 1 or 2 tablets intravaginally each day.
Supply: Bottles of 15.

Also available: MYCOSTATIN Tablets: 500,000 units, bottles of 12. MYCOSTATIN Ointment: 100,000 units per Gm., ½-ounce tubes.

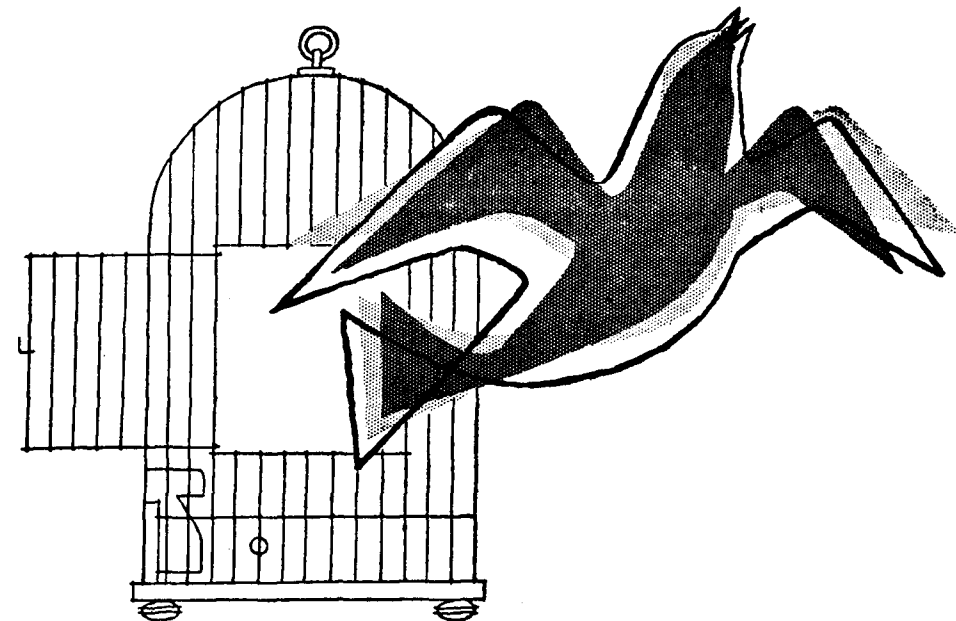


SARABHAI CHEMICALS, BARODA

Manufacturers & Distributors of Squibb Products in India.

"MYCOSTATIN" IS A TRADEMARK

S.C. 461



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succinctly expresses the relief of the asthmatic subject who uses 'Neo-Epinine' preparations. In the majority of patients 'Neo-Epinine' tablets sublingually or No. 1 Spray Solution by oral inhalation will rapidly relieve the attack. The intractable case will probably require No. 2 Compound Spray Solution, which is more potent and longer acting. 'Neo-Epinine' tablets, 20 mg., are available in catch covers of 4 and bottles of 25 and 100; 'Neo-Epinine' No. 1 Spray Solution and No. 2 Compound Spray Solution each in bottles of 10 ml. (10 c.c.)

'NEO-EPININE'

ISOPRENALINE SULPHATE

—in bronchial asthma



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Aimed to combat Anaemias

Acknowledged as the anti-anaemic therapy of proved merit, LIVULES contains proteolysed liver and stomach powder, iron, vitamins B-complex and C. Also available with folic acid or B12 or both; or with folic acid, B12, and intrinsic factor.

Each capsule contains:-

Proteolysed Liver Powder from	3.25 G. of fresh liver.
Proteolysed Stomach Powder from	1.0 G. of fresh stomach.
Ferrous Sulphate Exc. B. P.	0.1 G. (1½ gr. approx.)
Vitamin B1 B. P.	5 mg.
Vitamin B2 (Riboflavin B. P.)	2 mg.
Vitamin B6 B. P. C.	0.5 mg.
Calcium Pantothenate U. S. P.	1 mg.
Niacinamide B. P.	15 mg.
Vitamin C. B. P.	30 mg.
(Livules & Folic Acid) Folic Acid B. P.	1.5 mg.
(Livules & B12) Vitamin B12 B. P.	5 mcg.
(Livules & Folic Acid, B12 & Intrinsic Factor) Purified Intrinsic Factor Concentrate	10 mg.

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LIVULES

(One more variety—
LIVULES & Intrinsic Factor—
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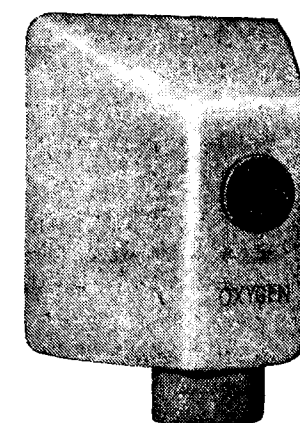
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YOU CAN PUT YOUR CONFIDENCE IN ALEMBIC.

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Modern surgery demands ever-increasing quantities of medical gases, which has hitherto involved the constant movement of cylinders; bringing in their wake inevitable noise and distraction where quiet efficiency would otherwise prevail. A Pipe-Line system for the internal distribution of gases has now been

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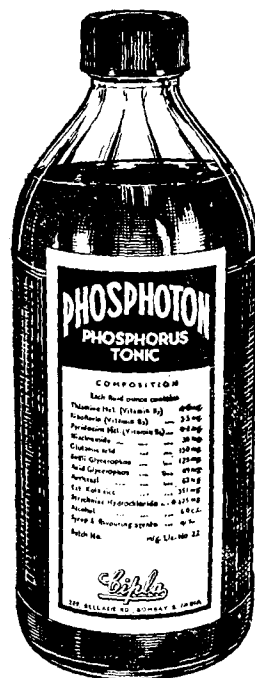
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after day's tiring work..

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Tonic Restorative

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PACKAGES
16 oz., 8 oz. & 4 oz.
BOTTLES.

Phosphoton is an excellent combination of Vitamins, Glycerophosphates, the stimulating nerve tonic Kola, the appetite giving Nux-Vomica and Glutamic Acid in a very palatable form.

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Throughout the reproductive life of a woman, there is constant drain on her iron reserves. The demands of pregnancy and lactation, and the haemoglobin losses of menstruation and parturition, render the women especially liable to anaemia.

With 'Plastules', adequate iron dosage may be administered with utmost therapeutic advantage. The inclusion of vitamin B₁₂, folic acid, liver extract and yeast, corrects any concomitant deficiency of these important haemopoietic factors.



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Wyeth

Available in four combinations

- ★ Plain
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Packing: Bottles of 30 and 300 capsules

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Asmac

for the symptomatic treatment of
BRONCHIAL ASTHMA

Combines the sedative action of allobarbitone
on the nervous system with
the spasmolytic action of ephedrine and xanthine
derivatives

while extr. of ipecacuanha improves expectoration

Tubes of 20 tablets.

Bottles of 100 and 500 tablets.

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In sickness, whatever the cause—travel sick-
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—Ancolan gives prompt relief.

*This unique antihistaminic is also widely used
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- A single dose of Ancolan acts for 24 hours
- Ancolan does not cause drowsiness
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ANCOLAN

(meclozine dihydrochloride)

Tablets (scored) containing 25 mg. • Bottles of 25 and 100

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for iron deficiency states

NEO-FERRUM

(colloidal ferric hydroxide)

combines rapid therapeutic effectiveness with palatability. Because it is less likely to provoke digestive upsets than other iron preparations patients with simple anaemia are more willing to follow treatment until their condition is resolved.

Economical in use, NEO-FERRUM is available as a liquid in 4 oz. bottles and in tablet form in bottles of 50 and 250 tablets. NEO-FERRUM INFANTS, in $\frac{1}{2}$ oz. bottles with pipette, is a special formulation ensuring complete miscibility with milk and, again, there is no danger of gastric disturbance even in the youngest patients.



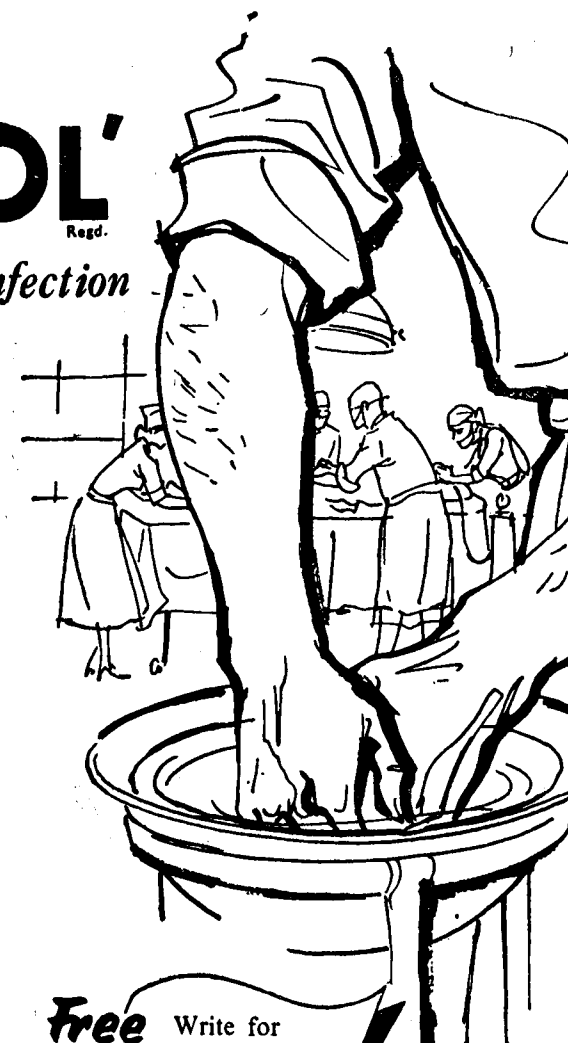
THE CROOKES LABORATORIES LIMITED
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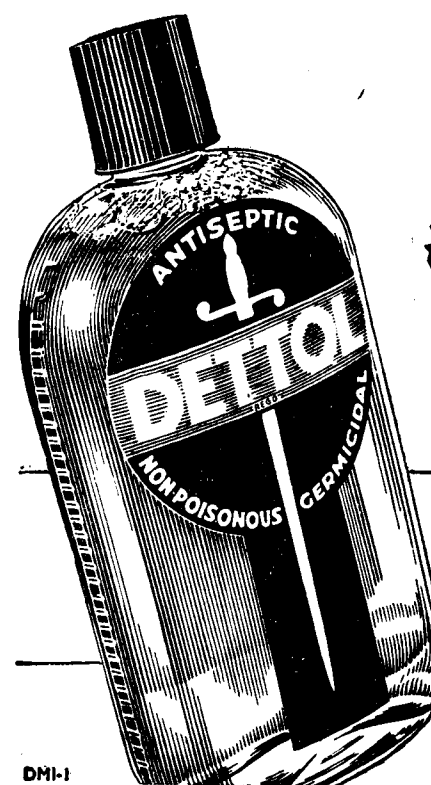
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guards against infection

- Disinfection of instruments
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'Ovaltine' is particularly suitable for convalescent patients, as has been proved in hospitals and nursing-homes without number. Tempting to the palate and easily assimilated, it supplies concentrated nourishment to rebuild body, brain and nerves.

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Sleep, rest of nature, O sleep, most gentle of the divinities, peace of the soul, thou at whose presence care disappears, who soothest hearts wearied with daily employments, and makest them strong again for labour!

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'ETHOBRAL' contains quinalbarbitone, 50 mg. ($\frac{3}{4}$ gr.); butobarbitone, 30 mg. ($\frac{1}{2}$ gr.); and phenobarbitone, 50 mg. ($\frac{3}{4}$ gr.) With 'ETHOBRAL' there is rapid onset of hypnosis, extended duration of sound sleep and freedom from barbiturate hangover. The rapid onset of sleep is due to the incorporation of quinalbarbitone; depth of sleep to quinalbarbitone plus butobarbitone - both of which are detoxified by the liver; the extended duration to the phenobarbitone - excreted by the

kidneys. This selective excretion of the incorporated barbiturates plus the fact that each is present in only a fraction of its usual therapeutic dose, makes 'ETHOBRAL' the barbiturate preparation least likely to produce toxicity or hangover.

In addition to insomnia, 'ETHOBRAL' is specifically indicated for day-time sedation or as a nocturnal hypnotic in the adjuvant treatment of Peptic Ulcer, Hypertension, Asthma, Premenstrual Tension, Menopausal stress and Anxiety state.

Hypnotic dose : 1 tablet before retiring.
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Tubes of 20 tablets.

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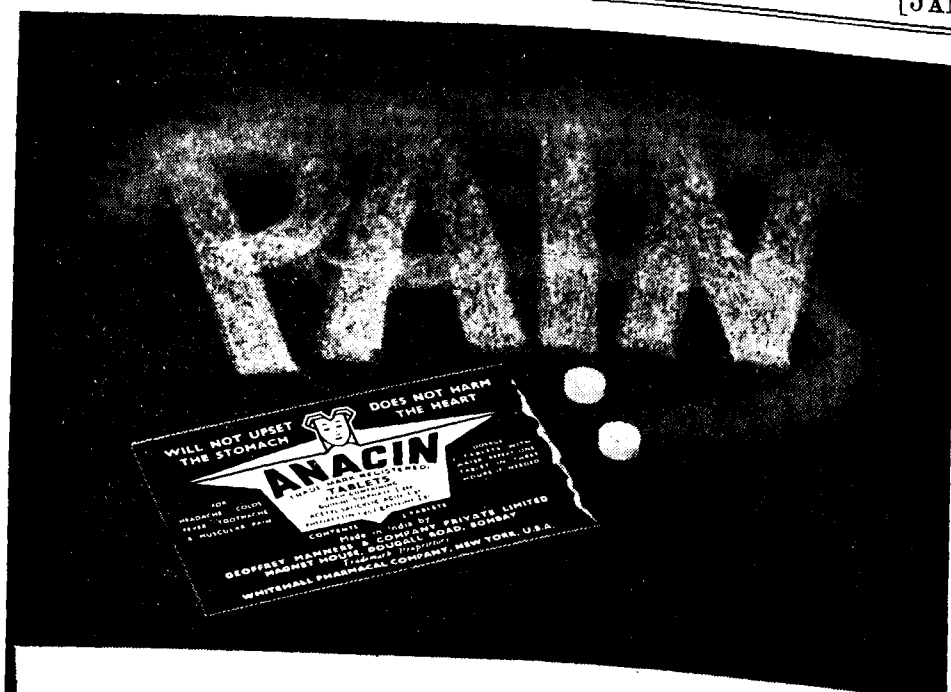
for all patients who need sleep



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**'ANACIN'**

alleviates the distress of pain and affords prompt relief from headache, toothache, muscular pain, cold and fever.

'ANACIN'

is a non-toxic and clinically dependable preparation.

'ANACIN'

provides a prolonged period of analgesia with a single dose of one or two tablets.

'ANACIN'

is obtainable in packets of 2 tablets, containers of 32 tablets and bottles of 500 tablets

Composition : Quinine 1/4 gr. Phenacetin 3 gr.
Caffeine 1/4 gr. Acetylsalicylic Acid 3 gr.

Made in India by :

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A New Combination

With Betaine Dihydrogen Citrate—the latest Lipotropic Agent for Infantile Liver, Infective Hepatitis and other Liver Disorders

SYRUP METHIONINE WITH CHOLINE FORTE

"ALBERT DAVID"

COMPOSITION :

Each fluid ounce contains :

Acetyl Methionine	...	4400 mgm.
Choline Dihydrogen Citrate	...	2500 mgm.
Betaine Dihydrogen Citrate	...	1500 mgm.
Folic Acid	...	5 mgm.
Vitamin B12	...	20 mgm.
Inositol	---	50 mgm.

In non-sugar base and aromatics.

ADVANTAGES :

Acetyl Methionine permits higher concentration of Methionine. Choline Dihydrogen Citrate is another lipotropic agent. Folic Acid and Vitamin B12 are essential for the synthesis of Choline and Methionine. Vitamin B12 helps growth in cases of Infantile Liver.

In bottles of 2 oz. and 4 oz. Literature on request.

ALBERT DAVID LIMITED

15, CHITTARANJAN AVENUE, CALCUTTA-13.

BOMBAY - MADRAS - DELHI - NAGPUR
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Use Loma, and regain your natural loveliness.

LOMA, the Universally acclaimed natural hair darkener is now available in specially designed bottle with pilferproof cap.



Sole Agents: M. M. Khambhatwala, Ahmedabad - 1.
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NAUNEHAL BABY TONIC

Useful in the following diseases of Children

GENERAL DEBILITY, RICKETS, INFLAMMATION OF GUMS, WEAKNESS DURING CONVALESCENCE, PELLAGRA, ARTHRITIS INFLAMMATION OF MOUTH, COLDS & CATARRH.

FORMULA

Each dose of 4-5 c.c. (approx. one teaspoonful) contains :-

Vitamin A	...	2000 I.U.
Vitamin B ₁	...	0.4 mg.
Vitamin B ₂	...	0.6 mg.
Niacinamide	...	5 mg.
Vitamin C	...	20 mg.
Vitamin D ₂	...	500 I.U.
Calcium Glycero-phosphate	...	0.5 gr.
Sodium Glycero-phosphate	...	0.25 gr.
Sucrose	...	q.s.

NAUNEHAL
THE RICHEST TONIC FOR BABIES

HERE IS HEALTH FOR YOUR BABIES!



NAUNEHAL GRIPE SYRUP

Useful in the following diseases of Children

CONSTIPATION, INDIGESTION, FLATULENCE, DIARRHOEA, DYSENTERY, TEETHING, ENLARGEMENT OF LIVER & SPLEEN, DISTURBED SLEEP, INFLAMMATION OF MOUTH, SALIVATION, ROUND WORMS & OTHER WORMS, EXCESSIVE THIRST.

FORMULA

Each dose of 4-5 c.c. (approx. one teaspoonful) contains :-

Aqua Pudina Destillata	...	3 min.
Aqua Zira Destillata	...	3 min.
Conc. Anisi Water	...	1 min.
Aqua Anethi Conc.	...	1 min.
Aqua Menth. Pip	...	1 min.
Soda Bicarb	...	2 grs.
Sodii Bromidum	...	1 gr.
Spt. Ammonia Aromat	...	1 min.
Spt. Chloroform	...	1 min.
Sucrose	...	q.s.

Hamdard

DAWAKHANA (TRUST) DELHI



FOR SPRAINS, STRAINS AND MUSCLE SPASM

*a new,
powerful unction*

Algipan supersedes all surface applications for relief of pain by the use of the potent new penetrative agent, methyl nicotinate, in conjunction with the powerful vasodilator, histamine. Methyl nicotinate opens the way for the histamine to penetrate tissues rapidly. There it promotes prolonged, pain-relieving hyperaemia, comforting analgesia and soothing warmth.



Wyeth

Packing :
Tubes of 40 Gm.

... for symptomatic relief of muscular aches, pains and stiffness associated with fatigue, over-exertion, muscle strains, fibrositis, arthritis, neuritis, sprains ... during physical rehabilitation following immobilisation for fractures; to calm the symptoms in bronchitis and other respiratory disorders. A non-greasy, cosmetically pleasing cream, requiring only gentle surface friction for application.

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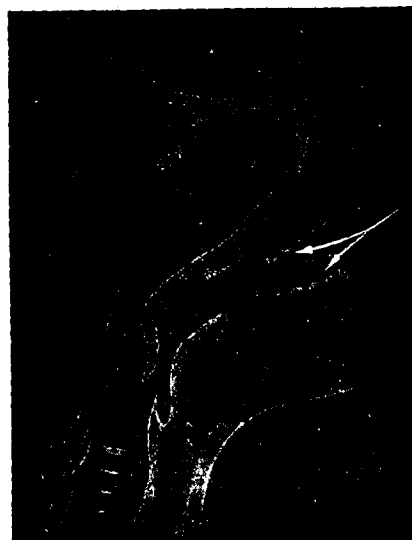
Calcium-Sandoz with VITAMIN C

500
mg.

VITAMIN C
in
10 cc



SANDOZ PRODUCTS
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*Concerning
a further advance
in the treatment of
bucco-pharyngeal
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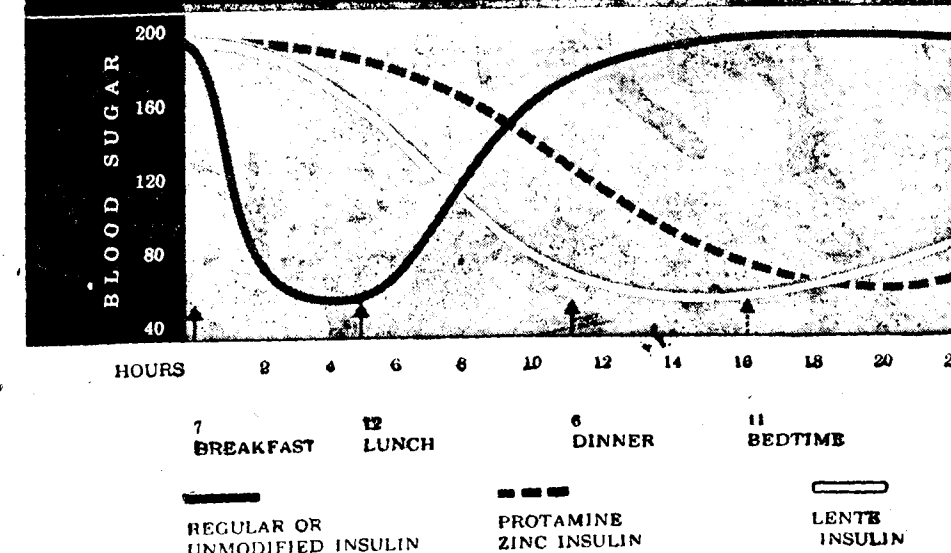
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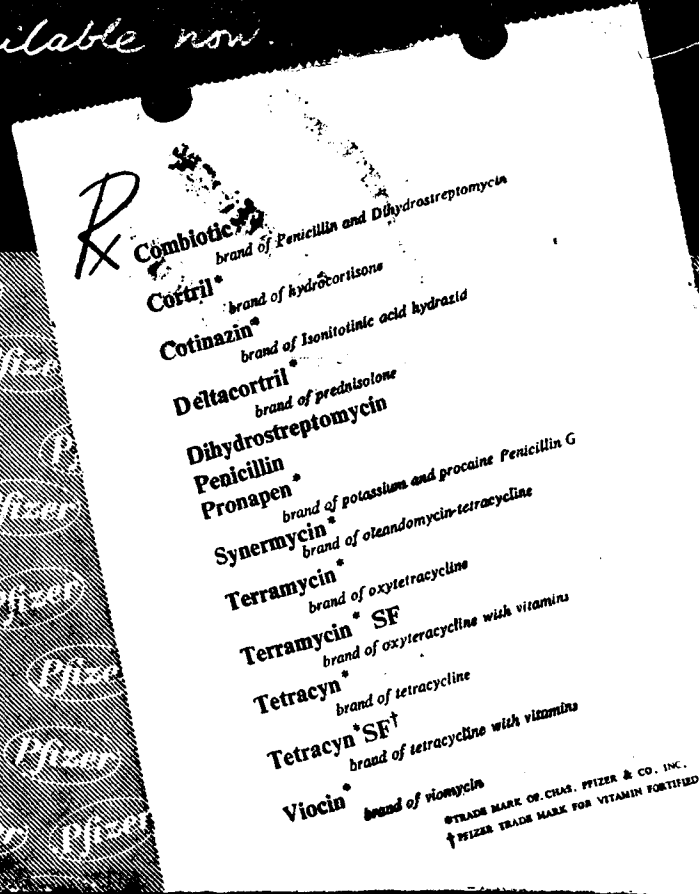
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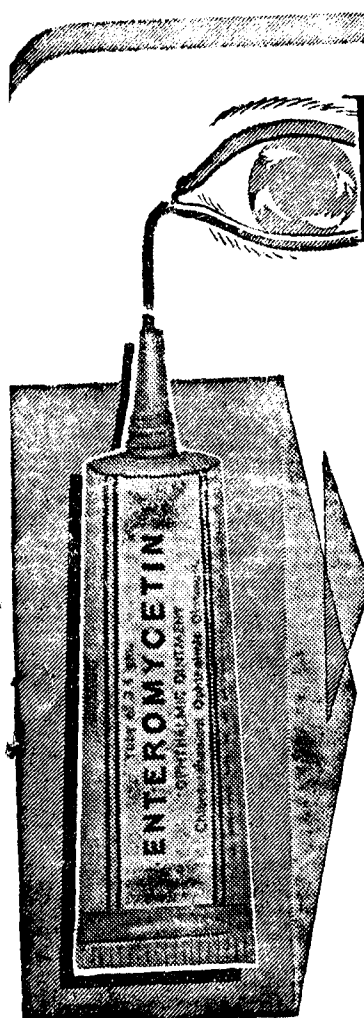
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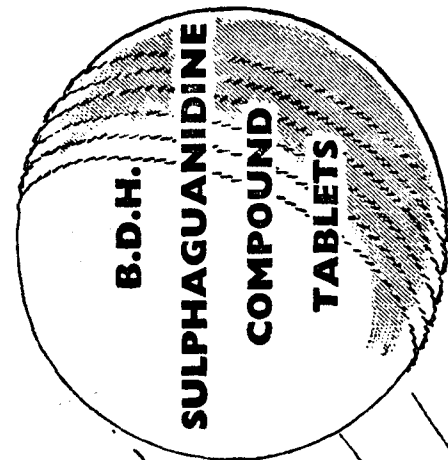
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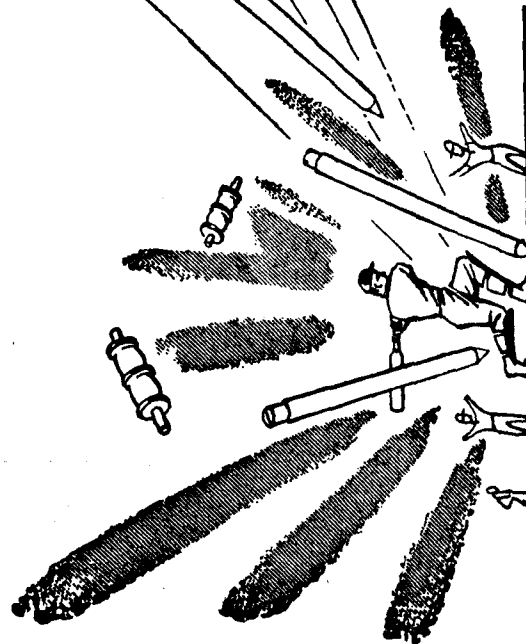
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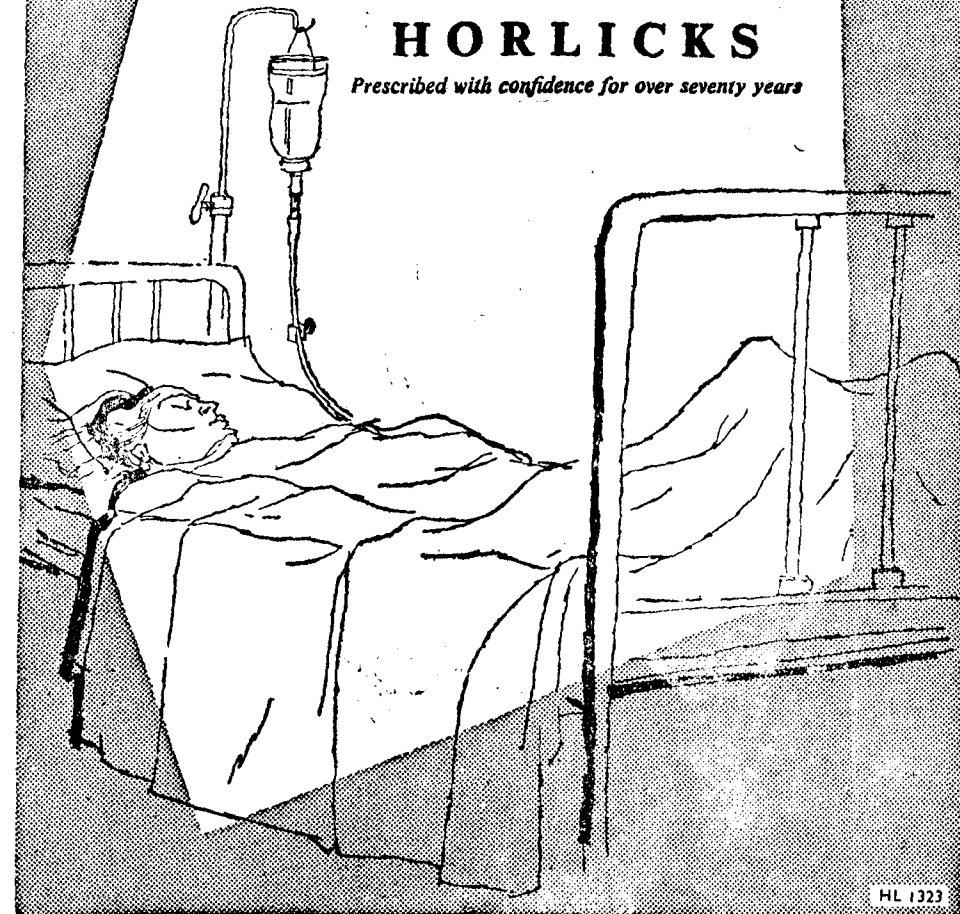
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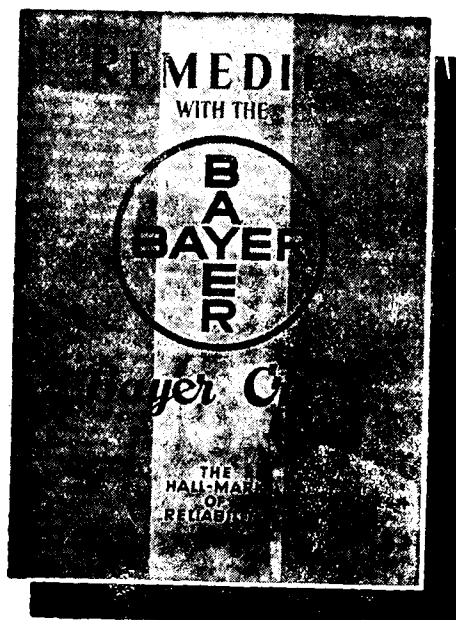
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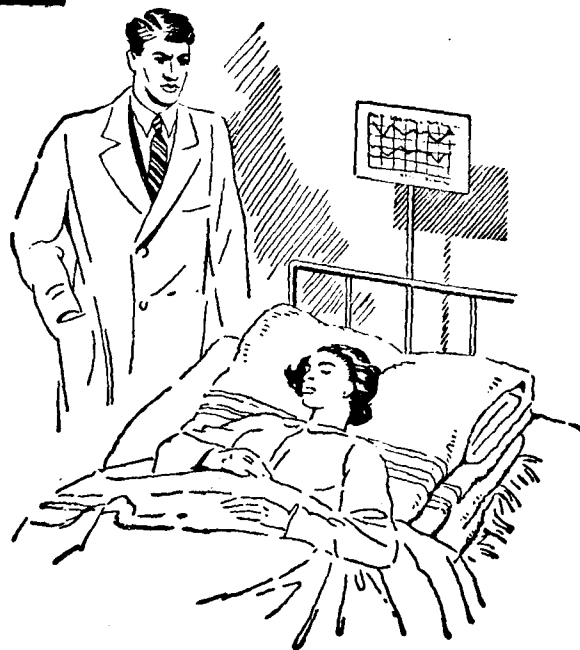
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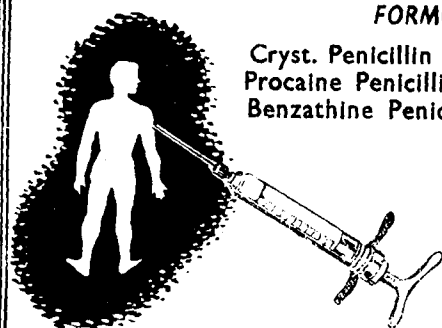
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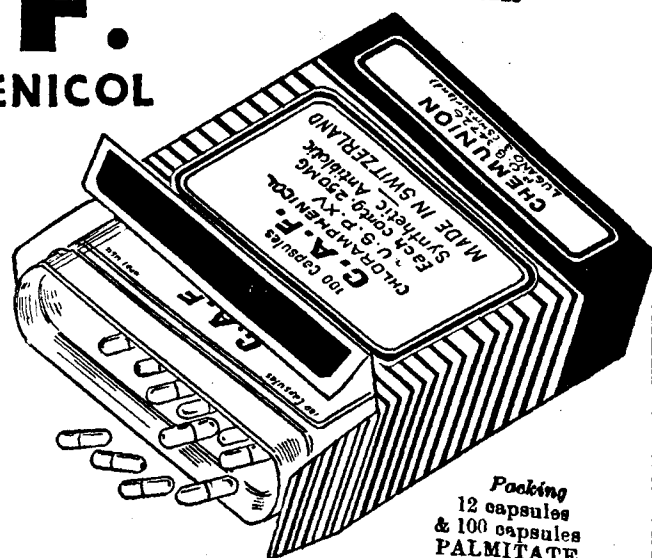
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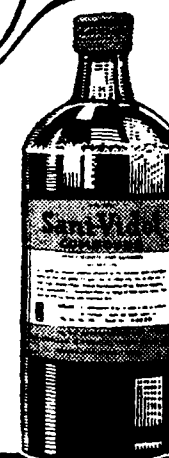
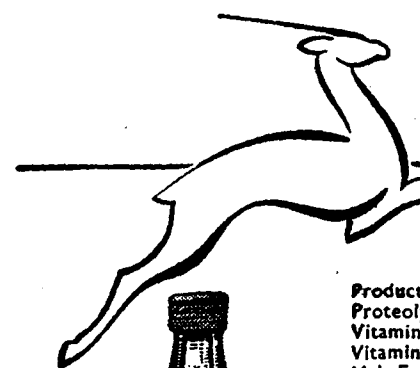
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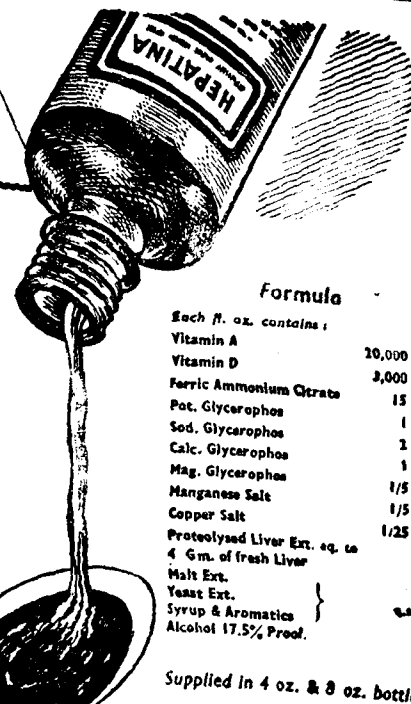


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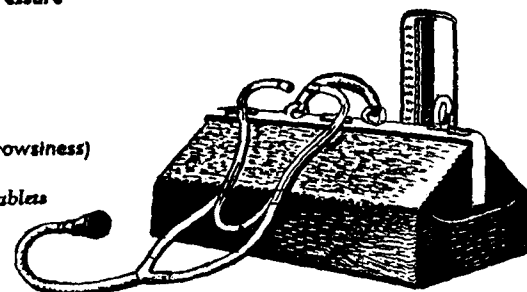
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No. 1

Original Articles

FILARIASIS*

Clinical Manifestations and Pathogenesis

B. S. RAHEJA, M.D.,
Bombay

Introduction.—When we talk of Filariasis (Wuchereria) we normally associate it with elephantiasis and lymphangitis and seldom realize that the disease can manifest itself in ways other than these. It is true that elephantiasis is the most striking phase of filariasis, but it is just one of its varied, and chronic forms. Moreover the disease is not quite so innocent or benign in character as is generally supposed. Apart from crippling deformities resulting from elephantiasis, the disease may manifest itself in vague, transient or illusive features or may be characterized by chronic, progressive, spasmodic, fulminating or even fatal lesions. Unless and until we are familiar with its varied symptomology, the disease is likely to be missed altogether or until irreparable damage has been done. Hence some of its commonly seen clinical features along with its probable pathogenesis, are discussed in this article.

The only positive way of diagnosing the disease is by detecting the infecting adult worm or the microfilariae.¹ The adult parasite could be found in biopsy material from the site of its location only in a few cases.² Microfilariaemia is an illusive phase of filarial infection and is encountered in a small percentage of known filarial subjects.³ Of late the role of filariasis in the causation of tropical eosinophilia is being stressed^{3,4,5} and in the majority of such cases microfilariae cannot be demonstrated in the blood. During the Second World War, 10,421 cases of filariasis were noted in the U. S. Navy and in most of them the diagnosis

* Specially contributed to the ANTISEPTIC.

was based in the absence of the demonstration of the parasite concerned.* Even intradermal tests, which were then in vogue could not always be relied upon and many false positives have been noted.² Hence the diagnosis of the disease in such cases has to be made on clinical findings suggestive of the disease when occurring in persons living in endemic areas.² The clinical manifestations in which the disease may exhibit itself, will now be presented.

Clinical manifestations.—Early signs and symptoms of filariasis are notoriously vague and variable. The initial symptoms and signs may be completely absent or some vague complaints may be made for which no obvious cause can be found. The initial attack may appear without any apparent cause or warning and may subside without any treatment, only to reappear later. This process may then be repeated. Some patients may show a localized swelling in some part of the body. When not properly recognized, the disease follows its natural course and after a variable time (a year or more) findings commonly attributed to filariasis may appear. Therapeutic trial with Diethyl-carbamazine may be of help in disclosing the mysterious nature of these complaints and one may be surprised at the good result obtained, when the complaints and even the obvious swellings which had resisted all other treatments for a long time begin to regress.

In the beginning, while dealing with cases of tropical eosinophilia or chronic recurrent cough, I had noticed that some of them were preceded by or associated with one or more of the features stated below. I have since seen several other patients residing mostly in a suburban district of Bombay, probably a hyperendemic area. Most of them have been observed for prolonged periods, during which they were subjected to various investigations. As a result of these investigations and other therapeutic procedures adopted, I feel confident in stating that the following clinical manifestations may be attributed to filariasis. They may occur singly or in combination in the same patient; and different features may be observed on different occasions. One may often find several members in the same house suffering from the disease but presenting apparently unrelated features. These patients are first seen mostly during the warm or rainy season or they may show a relapse or aggravation of their previous complaints during that period. It is interesting to note a marked increase in the incidence of the disease this year, particularly after the epidemic of influenza; this is however, only an impression of mine.

The clinical features commonly seen comprise:—1. *Pain* as a common complaint. Any part of the body may be the site of pain but the lower extremities and the lumbar region are the

usual ones. The pain is usually severe and shooting in character but occasionally it continues as a dull ache lasting for a fairly long time.

2. *Head-ache* is usually severe and lasts for a few hours. It may occur off and on without any obvious cause.

3. *Cramps* in the lower extremities, may be extremely severe, often completely restricting the activities of the patient. They may last for months without any apparent cause being found.

4. *Fever* is a prominent feature especially in children and in those who are new arrivals in the endemic area i.e., a non-immune population. The fever is usually irregular, may shoot up to 104°F or more, or may continue as a low temperature. It may begin with a rigor. Usually it lasts for a few days but may continue for a fortnight or more. It is characterized by a marked general malaise.

5. *Lymphangitis and lymphadenitis* are common characteristic manifestations of the disease. Lymphangitis is typically retrograde. Lymphadenitis is usually found in the axilla, neck or inguinal region but may also occur elsewhere. Glands are usually discrete, firm and freely movable. Pain is a prominent feature in some cases. Sometimes they regress without any treatment or may suppurate and heal.

6. *Parotitis*:—The swelling may start insidiously or suddenly but continue to increase. I have seen it in two children both aged about three years. In both it was unilateral and was prominent in the parotid region, fixed to the deeper tissues, firm and painful.

7. *Mastitis or a lump in the breast*:—It may begin as an acute mastitis. More commonly a lump is found which may sometimes be painful. In both cases a small or a medium-sized lump is found, which is firm and freely movable. There may be a blood-stained discharge from the nipple. Biopsy may have to be done to exclude malignancy.

8. *Funiculitis, epididymitis, epididymo-orchitis or orchitis*:—These are common manifestations and easily recognised.

9. *Respiratory complaints* are very common and consist of cough, cold, running in the nose or breathlessness. The course, duration and character of these symptoms are very variable. The cough is usually dry and hacking, getting often worse at night. Occasionally breathlessness is a marked feature; typical asthmatic attacks may occur. Some cases may reveal themselves as typical cases of tropical eosinophilia. In some cases pain in the chest usually severe and stabbing in character or shifting from one part of the chest to another may be the only complaint. Occasionally it may be associated with a blood-stained sputum or there may be evidence of pleurisy. Radiological examination

thrombosis, giant-cell formation and tissue eosinophilia—changes particularly marked in the environments of the dead and decaying worms. In chronic cases massive fibrosis is a marked feature. In tropical eosinophilia (or Loeffler's syndrome) vascular changes have been observed in the arterioles and in the small and medium-sized arteries and are characterized by a thickening of the intima, hypertrophy of the media and eosinophilic cellular infiltration of the vascular walls. There may be necrotizing arteritis and arteriolitis or thrombophlebitis. Among other changes, pronounced interstitial inflammation, giant-cell formation and granulomatous lesions resembling those of rheumatic fever have also been observed. In chronic cases, pronounced proliferative processes with fresh connective tissue formation are prominently seen.

It would therefore, appear that the histological changes observed in filariasis are essentially similar in character to those seen in cases of tropical eosinophilia, i.e., an expression of an antigen-antibody reaction. The nature of the reaction following an allergic insult depends upon such factors as the strength of the stimulating antigen, responsiveness of the antibody production, speed and duration of antigen-antibody production¹⁸. A favourable or unfavourable alteration of the reaction may result from previous antigenic exposure. Consequent tissue-injury may thus vary from transient and reversible to a necrotizing or granulomatous reaction of a chronic course or of fatal termination. On the basis of histological changes, Bergstrand,¹⁷ postulated a basic similarity between Loeffler's syndrome, rheumatic fever and periarteritis nodosa with asymptomatic Loeffler's syndrome, at one end of the process and deadly periarteritis nodosa, at the other end. Harkavy¹⁹ advanced the concept of general vascular allergy which may concurrently or alternatively lead to pathological changes in other organs and tissues under the effect of the same allergenic stimulation, the vascular response varying from thickening and eosinophilic cell-infiltration of the walls to manifestations typical of periarteritis nodosa, depending on the intensity and duration of an angiotropic allergic reaction. In Loeffler's syndrome, as in other allergic disorders, changes are not confined to the lungs but involve the whole body¹⁷. Harkavy¹⁹ has recorded other complications like purpura, necrosis of the skin, polyneuritis and transient polyarthritis. In one of his cases, postmortem examination showed hyperergic vascular changes in the coronary vessels and in the pericardium progressing to the stage of periarteritis nodosa.

It will therefore, be appreciated that in filariasis, if we can have tropical eosinophilia as one of its manifestations, it is not unlikely—it is perhaps possible to have simultaneously or alternatively other manifestations as a result of a similar antigen-antibody reaction in other parts of the body. Thus a wide

variety of clinical manifestations, varying from transient, migratory or reversible lesions to chronic progressive or even fulminating and fatal episodes can occur. The intensity or degree of parasitic infestation, its extent and duration, the responsiveness or degree of sensitization of the host, associated infections, adrenocortical activity etc. may determine the nature or course of the disease. Moreover in an endemic area, the victim is always exposed to the risk of re-infection and how this may modify the course of the disease is not easy to assess.

(b) *Response to diethylcarbamazine.*—Diethylcarbamazine is very effective in various forms of filariasis^{19, 20, 21} and ascariasis.²² Ascariasis can be ruled out of consideration on account of the fact that the adult normally dwells in the alimentary tract and that during prolonged observation, treatment, and follow-up, no evidence of ascariasis could be found in the vast majority of cases. It therefore, follows that the response to diethylcarbamazine was due to its chemotherapeutic effect on the filarial parasite. It has been demonstrated that the administration of diethylcarbamazine brings about an almost immediate and drastic reduction in the number of the circulating microfilariae²⁰. Aggravation of symptoms or other systemic reactions, following the administration of the drug, probably due to its lethal action against the parasite, are often met with and this is in contrast to the practical absence of reactions seen in cases of tropical eosinophilia.^{23, 24}

The limitations to the therapeutic efficacy of the drug in some of the chronic stages of the disease must now be mentioned. It will be easy to understand that when fibrous tissue-proliferation has taken place, the response to the drug may not be as desired. Microfilariae when present within a serous cavity, are not readily destroyed²⁵. How far the adult worm is affected by the drug is not definitely known. Chances of reinfection in endemic areas have also to be taken into consideration. In many cases especially in some of the acute episodes, the simultaneous administration of corticosteroids or antihistaminics may prove to be of considerable value.

(c) *General considerations:*—From what has been stated, it will be seen that the incidence and the serious nature of filariasis, has been very much underestimated. So far we are familiar only with some of the many facets of the disease. It therefore appears that the incidence of filariasis in endemic areas in India may be much higher than what we are made to believe.

For a proper recognition of the disease, the following points may be of some help:—(1) the nature of the clinical manifestations; (2) residence in an endemic area; (3) complaints being often more marked at night time; (4) many of the patients being first seen during the hot or rainy season; (5) laboratory aids. The finding of microfilariae in the blood or urine is of considerable

value but a negative finding does not rule out their presence. The importance of other investigations must not be under-rated as they help to eliminate several other clinical conditions exhibiting similar features. The blood frequently shows a slight or marked eosinophilia; this is usually marked when the lungs are involved. In serous lesions blood-eosinophilia may be negligible. The blood-sedimentation rate may be raised and (6) the result of therapeutic trials with diethylcarbamazine will be helpful.

Before concluding, I would like to stress one point. We know that various allergic syndromes like transient pulmonary infiltration, rheumatic conditions, periarteritis nodosa etc., can be caused by various parasitic, bacterial, viral or chemical agents. The importance of parasitic conditions has however, been considerably underestimated. The reported therapeutic efficacy of antimalarial drugs in rheumatoid arthritis and lupus erythematosus^{25, 26} and of emetine in a case of complete heart block,²⁷ may be pointers in the same direction.

Summary.—1. Filariasis manifests itself in many varied, and apparently unrelated forms. Various clinical manifestations commonly seen in practice are mentioned and discussed.

2. The clinical manifestations in filariasis are usually obstructive and inflammatory. Secondary infection may completely mask the true nature of the disease. Obstructive lesions are the result of repeated and progressive inflammatory changes. It is believed that maturing or adult parasites and their secretions or disintegrating products are responsible for the inflammatory lesions, which are allergic in nature. The pathogenesis is discussed.

3. When the parasite worm or the microfilariae cannot be detected, the diagnosis of the disease, must be based on clinical manifestations and other data. Therapeutic trial with diethylcarbamazine is helpful.

4. The fact that the incidence and the seriousness of the disease is very much under-estimated is pointed out.

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CIRRHOSIS OF THE LIVER IN ASSAM*

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THE term "cirrhosis of the liver" is used to denote "organizing and fibrosing hepatitis" and does not connote any ætiological or pathological entity. It is the result of various types of hepatic lesions with a wide range of ætiological factors. Hims-worth¹ rightly suggests that such a term should be abandoned and the terms "diffuse hepatic fibrosis and post-necrotic scarring with nodular hyperplasia" should be used instead as these have some relation to the ætiology, pathology and prognosis. Studies on the causative factors would indicate that the various economic, dietetic and other factors obtaining in a given society largely determine the type of liver damage and the treatment and prognosis of hepatic fibrosis. A number of studies on cirrhosis of the liver have been made in foreign countries and also in different parts of this country, except in Assam where the people have certain socio-economic characteristics of their own. This paper covers a study of 200 cases of cirrhosis of the liver admitted into the medical wards of the Assam Medical College Hospitals in Dibrugarh.

Criteria for diagnosis.—Correlation of clinical features with results of physical examination and liver-function-tests were made for purposes of diagnosis. All the cases were carefully examined to exclude heart and kidney diseases. The gastrointestinal tract was radiologically investigated to exclude malignancy, when there was any doubt.

Cases having some of the clinical features of hepatic insufficiency e.g., nausea, anorexia, abdominal discomfort after taking food and vague pain in the abdomen with an enlarged liver but without palpable spleen were subjected to functional tests of liver, blood-protein estimation, hippuric acid test and Takata-Ara tests. If these pointed to hepatic insufficiency, the cases were taken as early cases of cirrhosis of the liver.

Cases having enlarged spleen and ascites but without any complaints pointing to hepatic insufficiency were again subjected to hepatic functional tests as detailed above and a diagnosis of 'cirrhosis' was made when the tests were positive.

Cases with clinical features of hepatic insufficiency with enlarged spleen, ascites with or without enlarged and irregular liver were diagnosed as cirrhosis of the liver; functional tests were done when there was any doubt.

Age.—The age-war incidence of the disease is given in Table I (vide p. 10).

* Specially contributed to the ANTISEPTIC.

Seventy three per cent of the cases occurred in the age group of 20 to 49 years; the maximum incidence (30.5%) being in the 4th decade; this tallies with the findings of Konar³ (1957) at Calcutta and of Sarin⁶ (1956) at Jaipur, Wig *et al*⁷ (1957) found however, that in their series the largest number occurred in the 4th to the 7th decade with a maximum incidence (27.3%) in the 5th decade. Beaumont records that cirrhosis occurs usually above the age of 40.

Sex:—As regards sex distribution, 161 (80.5%) cases were males and 39 (19.5%) were females; the number of males being nearly 4 times that of females. Wig *et al*⁷ (1957) had about threetimes more males and in Sarin's⁶ cases the number of males was less than double.

Occupation:—Our cases fell into three groups according to their incomes:—low, middle and high. The low income group included the farmers, daily wage-earners, and petty shop-keepers; the middle income group comprised teachers, office assistants, shop-keepers and petty land-owners; and the high income group included businessmen, lawyers, doctors, professors and big land owners. In this series 180 (90%) belongs to the low, 18 (9%) to the middle and 2 (1%) to the high income groups respectively.

Past history:—Details of their the past history are recorded in Table II, alongside.

Seven per cent in our series and in Sarin's gave a history of infective hepatitis; Robson⁸ noted infective hepatitis in 10% of cirrhotic patients; 8% of Sarin's patients gave a history of alcoholism; Patek *et al*⁴ noted more than half of their cases with such history. In our series 21% of the patients were alcoholics. Malaria, kala-azar, dysentery and other tropical diseases are considered to be aetiological factors in the orient; our series showed that 58 (29%) cases manifested these maladies.

Presenting symptoms:—Analysis of the presenting symptoms is given in Table III (vide p. 11).

TABLE I

Showing the age-war incidence

Age-group	No.	Percentage
0-9	6	3
10-19	11	5.5
20-29	34	17
30-39	61	30.5
40-49	51	25.5
50-59	22	11
60-69	13	6.5
70-79	2	1

TABLE II

Giving details of past illnesses

	No.	Percentage
Infective hepatitis	14	7
Alcoholism (Habitual)	42	21
Malaria (Repeated attacks)	4	2
Kala-azar	13	6.5
Loose motions	24	12
Irregular temp. (? aetiology)	14	7
Delivery (just preceding onset)	4	2
Syphilis (W.R. + ve)	2	1
Diabetes mellitus	3	1.5

Swelling of the abdomen (ascites) and "œdema of the legs" were the commonest complaints; Patek *et al* and Flamming *et al*⁴ reported the same findings. Sarin noted 'distention of the abdomen' to be the commonest symptom.

TABLE III

Showing the prominent presenting symptoms

Symptoms	No.	Percentage
Swelling of abdomen (ascites)	185	92.5
œdema of legs	136	68
Anorexia	118	59
Scanty urine	106	53
Loose motions	76	38
Low temperature	75	37.5
Fatigue	43	21.5
Constipation	36	18
Difficulty in breathing	34	17
Discomfort after food	24	12
Pain in epigastrium	24	12
Pain in rt. hypochondrium	18	9
Hæmatemesis	11	5.5
Jaundice	7	3.5
Piles	5	2.5

Blood-pressure:—The analyses of the blood-pressure readings in 136 cases is given in Table IV, below.

The blood-pressure was 112.5 + 15.6/72.6 + 13.3 mm. of Hg. Konar³ (1957) found that the systolic blood-pressure "varied from 130-85 mm. Hg." and diastolic from "82-48 mm. Hg."

TABLE IV

Showing blood-pressure readings

Systolic		No. of cases
Range		
80-84 mm. Hg.		1
85-89 " "		1
90-94 " "		18
95-99 " "		7
100-104 " "		19
105-109 " "		16
110-114 " "		27
115-119 " "		10
120-124 " "		15
125-129 " "		4
130-134 " "		6
135-139 " "		2
140-144 " "		3
145-149 " "		2
150-154 " "		3
155-159 " "		1
160-164 " "		1
Diastolic		No. of cases
Range		
50-54 mm. Hg.		7
55-59 " "		10
60-64 " "		25
65-69 " "		8
70-74 " "		41
75-79 " "		7
80-84 " "		21
85-89 " "		4
90-94 " "		10
95-99 " "		0
100-104 " "		2
105-109 " "		1

NOTE:—The mean value for the systolic blood pressure is 112.5 mm. Hg. with a standard deviation of 15.6 and that for diastolic is 72.6 mm. Hg. with a standard deviation of 13.3.

TABLE V

Showing the total proteins, albumin and globulin in each 100 cc. of blood

Total protein in gm. per 100 cc. of blood		No. of cases
Range		
3-3.9		2
4-4.9		11
5-5.9		45
6-6.9		39
7-7.9		7
Amount of albumin in gm. per 100 cc. of blood		No. of cases
Range		
1-1.9		11
2-2.9		44
3-3.9		26
4-4.9		20
5-5.9		3
Amount of globulin in gm. per 100 cc. of blood		No. of cases
Range		
1-1.9		16
2-2.9		55
3-3.9		25
4-4.9		7
5-5.9		1

NOTE:—The mean value is 5.9 gm. per cent with a standard deviation of 0.8 hence the amount of total protein per 100 cc. of blood is 5.9 ± 0.8 gm.

NOTE:—The mean value is 3.1 gm. per 100 cc. of blood with a standard deviation of 1 so that the amount of albumin is 3.1 ± 1 gm/100 cc. of blood.

NOTE:—The mean value is 2.8 gm/100 cc. of blood with a standard deviation of 0.8 hence the amount of globulin is 2.8 ± 0.8 gm/100 cc. of blood.

the average being 102/71 mm. Hg. No standard deviation was

mentioned and hence the range of dispersals around the mean cannot be gauged.

Blood-protein:—The total proteins albumin and globulin in blood were estimated in 104 cases. The results are given below in *Table V* (*vide p. 11*).

Dutta and Chakravarty¹ (1957) gave the results of their investigations regarding blood-protein on healthy Indian men and women as follows: the mean values in grammes per 100 cc. of blood with standard deviation for total protein were $7.51 \pm .23$, for albumin, $4.93 \pm .20$ for globulin, $2.58 \pm .16$ for men and the corresponding values for women were $7.49 \pm .27$, $4.87 \pm .21$, $2.60 \pm .18$; the albumin : globulin ratio was 2.21. Comparing those with ours in the present series it will be seen that the amounts of total protein and albumin in the blood were reduced and the amount of globulin was increased and the albumin : globulin ratio was altered, as would be expected in cases of liver damage.

TABLE VI
Showing the leucocyte count in the blood

Range	No. of cases	p.c.
2000—2900/cmm of blood	5	2.5
3000—3900	11	5.5
4000—4900	35	17.5
5000—5900	53	26.5
6000—6900	47	23.5
7000—7900	24	12
8000—8900	7	3.5
9000—9900	8	4
10000—10900	4	2
11000—11900	6	3

TABLE VII
Showing the hæmoglobin percentage (Hellige)

Range	No. of cases	p.c.
0—9 p.c. (Hellige)	0	—
10—19	2	1
20—29	10	5
30—39	46	23
40—49	48	24
50—59	47	23.5
60—69	34	17
70—79	10	5
80—89	3	1.5

Complications:—37 (18.5%) had bronchitis, 30 (15%) had pyelo-nephritis and 3 (1.5%) cases had tuberculous infection.

Discussion.—Age:—Cirrhosis of liver occurred in an earlier age group in Assam than in western countries, the age-period of maximum incidence being 20 to 49 years.

Aetiology:—The number of people in the low-income group amongst the general population in the State is higher than that of the middle and high income groups, a fact which was

Leucocytes:—The leucocytic counts are set forth in *Table VI*, alongside.

87.5% of the cases had their leucocytic count within the range of 4000–7900/cmm. which is the normal range.

Haemoglobin:—Hæmoglobin estimation in Hellige's scale is given in *Table VII*, below.

93.5% of the cases had hæmoglobin values below 70% (Hellige).

Stools:—The examination of stools revealed that intestinal infestation with round worms was present in 73 (36.5%); hook worm in 34 (17%); entamoeba histolytica in 3 (1.5%); and giardia intestinalis in 2 (1%) of cases.

reflected also in the incidence of the disease amongst the hospital cases; the overwhelmingly high incidence (90%) of cirrhotic cases amongst the low-income group in our series points to the fact that the disease is more prevalent in the low income group of people who have to toil hard for their living; this is contrary to the observation of McNee that "it is more common amongst the individuals who follow a sedentary occupation."

The diets of both the low and middle-income groups were deficient in protein which is a definitely costly food material. Nearly all the cirrhotic patients suffered from protein-deficiency. In addition, 7% had infective hepatitis and 21% were given to alcohol. The incidence of infective hepatitis and alcoholism amongst the general population in the State is about 7% and 21% respectively; it is obvious therefore, that infective hepatitis and alcoholism were important ætiological factors. The virus of infective hepatitis directly damages the liver parenchyma and alcohol, in addition, produces a nutritional deficiency state, through gastritis and economic bankruptcy. Seventeen per cent of our cases suffered from kala-azar and repeated attacks of malaria but the exact ætiological significance of these is difficult to evaluate. These two diseases being common in this state, their occurrence might only be incidental. Loose motions, intestinal infestations with round worm, hook worm and giardia intestinalis aggravated nutritional deficiency; cases following delivery might as well be due to deficient nutrition which was rendered worse during pregnancy. It will therefore, be seen that except for infective hepatitis and alcohol which together, accounted for 28% of the cases, nutritional deficiency, primary or secondary to tropical diseases and/or to the increased demands of the body was the most potent factor in the production of cirrhosis of the liver.

Presenting symptoms.—The early symptoms of hepatic parenchymal dysfunction include fatigue, anorexia, nausea and flatulence (Himsworth) and it is only in the early stage of cirrhosis that a more or less normal life can be ensured by proper treatment. Fifty-nine per cent in our series complained of anorexia, 21.5% of fatigue and 12% of flatulence. Konar noted loose motions, fever and pain in the right hypochondrium to be other early symptoms; and in our series 38% had loose motions, 37.5% had fever and 9% of the cases had pain in the right hypochondrium. As in Konar's series nearly all our cases (92.5%) complained of swelling in the abdomen when reporting for treatment and the swelling was due to accumulation of fluid, indicating that ascites was the compelling symptom; much importance was not attached to other symptoms by the patients or they did not have any. Portal hypertension is the most important cause of ascites; hypoalbuminæmia, accumulation of

anti-diuretic hormones and retention of sodium ions also contribute to the fluid-formation. Portal hypertension is caused by a disorganization of the hepatic structure, fibrosis and distortion of the vessels and when such anatomical changes occur normal life cannot be assured even by energetic treatment. Early diagnosis necessitates health consciousness and health education of the people and awareness on the part of the physician so that treatment may be instituted sufficiently early in order to be effective.

Blood protein:—3.1 g. per cent of albumin is the critical level in blood below which oedema occurs. In the present series the value of albumin was 3.1 ± 1 g. % and 49 (47%) cases had albumin ranging from 3 to 5.9 g. per cent and 138 (69%) cases showed oedema of the leg; it is therefore, possible that the retention of sodium and the accumulation of the anti-diuretic hormone were no less important in the retention of fluid in the body than hypoalbuminaemia.

Leucocytes and haemoglobin content of blood:—The white cell count was almost normal but the haemoglobin content was lower. 93.5% of cases had haemoglobin below 70% (Hellige). Since the diet itself was deficient in the essential food factors it is not possible to assess definitely how far, if at all, cirrhosis *per se*, was responsible for the anæmic state.

Complication:—Though cirrhotic people are susceptible to various infections, tuberculous infection was found only in three (1.5%) cases.

Summary.—1. Most cases of cirrhosis of liver (73%) in Assam occur in the early age group (20 to 49 years).

2. Nutritional deficiency either primary or secondary to various tropical diseases like malaria, kala-azar, "loose motion" and intestinal infestations are the commonest causes; alcoholism (21%) and infective hepatitis (7%) are other important aetiological factors.

3. Swelling of the abdomen (ascites) (92.5%) and oedema of the legs (68%) are the most common presenting symptoms.

4. Hypoalbuminaemia below the critical level of 3.1 g. per cent was not found in all cases; the albumin: globulin ratio showed a change.

5. Blood-pressure was in the normal range.

6. Leucocytic count was also normal.

My thanks are due to the Superintendent, Assam Medical College Hospital for permission to report the cases and to Mr. B. Bhattacharjee, Librarian, Assam Medical College for his help.

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BLINDNESS*

Its Causes and the Preventive Measures

To be taken by the Public, the Profession and the State

V. KALYANASUNDARAM, M.B., B.S., L.O.,
 Regd. Medical Practitioner, and Eye Specialist,
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PART I

THE most important causes for blindness or grossly diminished activity of vision of one or both eyes of many individuals, which, unfit them for normal daily avocations and thereby cause them to be a burden on their relatives and friends or on the state will be discussed in this article. The blinding diseases may for purposes of classification, prevention and treatment be studied from the point of view of their occurrence at various stages of life, i.e., 1. Infancy and childhood, 2. Adulthood, 3. Senility.

Infancy and childhood.—1. The most important disease causing blindness in the early days of infancy, the symptoms of which appear within 10 days after birth, is infantile purulent conjunctivitis, otherwise known as ophthalmia neonatorum. The signs usually appear on the third day after birth; but sometimes as late as ten days after birth, if an antiseptic had been used initially, inhibiting the micro-organism or if a subsequent infection has taken place derived from the fingers of the mother or the nurse. It nearly always affects both the eyes and is usually due to inoculation from the vaginal discharge of the mother. The gonococcus which causes the condition is generally found in the purulent discharge from the eyes. Acute mucopurulent or catarrhal conjunctivitis which may occur in new-born children is due mostly to Koch-week's bacillus, influenza bacillus, streptococcus or staphylococcus aureus and albus. In this condition, the muco-purulent discharge glues the lid margins together and the lids do not show as much chemosis as in ophthalmia neonatorum. Conjunctivitis due to irritation set up by the antiseptics used during labour, may also be found in new-born children. In mild cases of ophthalmia neonatorum, the bulbar conjunctiva may show very slight or no congestion at all, and the palpebral conjunctiva when examined closely will show a velvety appearance with a small amount of discharge of a purulent character, with no swelling or oedema of the lids. In severe cases, the lids are swollen, red or bluish red in colour and their ciliary margins are glued together by discharge. On opening the lids, the palpebral fissure becomes filled with pus, obscuring all view of the eye; when this is wiped off, fresh pus wells up and must be washed off before the corneal and conjunctival

* Specially contributed to the ANTISEPTIC.

surfaces can be seen. The palpebral conjunctivæ are red, granular-looking, and tend to protrude and fill up the palpebral aperture unless care is taken to prevent this eversion of the lids. The prognosis is good as a rule if the case is seen and treated early. The chief complications are corneal ulcers, leukoma adherens, iritis, anterior polar cataract, and panophthalmitis, followed by a shrinking of the globe. Later complications are anterior staphyloma, nystagmus and squint.

TREATMENT—Prevention :—The eyes of every new-born infant should be wiped clean, immediately after birth with cotton wool soaked in some antiseptic solution, like Boracic acid 10 grs. to an ounce, and then one or two drops of silver nitrate solution 3 grs. to an ounce, should be instilled into them; and if the conjunctivæ show the slightest sign of congestion, or discharge and sticking together of the lids, the eyes should be washed freely with Mercury perchloride lotion (1 in 5000) and boric ointment or better still Irgafen ointment should be applied to both eyes soon after birth and for three or four days thereafter. This will prevent ophthalmia neonatorum. Once the infant shows signs of the condition, the eyes must be washed twice or thrice a day with Mercury perchloride lotion (1 in 5000); silver nitrate drops 3 grs. to an ounce, should then be instilled once a day and Irgafen ointment applied thrice daily for a few days.

Once the cornea shows any little sign of inflammation as manifested by a diffuse haze or even slight ulceration, silver nitrate drops should be avoided, and the eyes irrigated daily with Mercury perchloride lotion and then atropine drops (4 grs. to 3i) are instilled into the eye once a day for three or four days, and sulphanilamide ointment (Irgafen) applied three or four times a day for at least a week. Systemic treatment with penicillin injections is also given; penicillin drops (2500 units per cc.) are applied locally in these cases frequently.

2. *Membranous conjunctivitis* in all degrees of severity occur most often due to diphtheria in children under the age of four years. It may follow an attack of measles and is frequently followed also by eczema. One or both eyes may be involved. It is an acute disease occurring sporadically or in epidemics. It is characterized by the existence of a fibrinous exudate either on the surface or in the substance of the conjunctiva in addition to other symptoms of inflammation. It occurs in two forms:—as a mild croupous or a severe membranous conjunctivitis.

The symptoms of mild croupous conjunctivitis are those of catarrhal conjunctivitis which, in a few days, is followed by the appearance of a greyish pellicle on the palpebral conjunctiva, sometimes also on the retrotarsal folds but rarely on the bulbar conjunctiva. The false membrane can be peeled off, leaving a mucous surface underneath which may or may not bleed. The

lids, which may be red and swollen are always soft and easily everted. After a week, the second or secreting stage sets in, with the appearance of a discharge, and the false membrane becomes separated, leaving a healthy mucous surface, which gradually returns to the normal condition without any trace of scarring. Corneal complications may occur in about a third of the cases. The Klebs-Loeffler bacillus is found in the conjunctival discharge and in addition any of the micro-organisms which cause acute catarrhal conjunctivitis such as staphylococci, streptococci and Koch Week's bacillus may also be present giving rise to fibrinous exudations and the formation of membrane. Non-diphtheritic, membranous conjunctivitis of varying degrees of severity may be caused by chemical irritants like lime, ammonia, lead, alkalis, acids, burns, producing conjunctival inflammation.

In severe membranous conjunctivitis, strepto- and staphylococci are usually associated with diphtheria bacillus. Microscopically, the membrane consists of a fibrinous network containing leucocytes, a few epithelial cells and often micro-organisms. In croupous cases, the underlying epithelium may or may not be adherent to it, but even if it is not adherent, although the epithelium separates along with the membrane, the surface left behind is smooth, and covered by regenerated epithelium, so that no trace of scarring occurs. On the other hand, in the severe forms of diphtheritic membranous conjunctivitis, the submucous tissue is involved in the exudation, producing a compression of the vessels which leads to necrosis. When the necrosed tissue is cast off, a granulating surface is exposed which heals by cicatrization. Diphtheritic conjunctivitis is a very serious ocular disease and should be treated even in the early stages by suitable therapy so as to prevent corneal and other complications setting in, and destroying the sight. The subjective symptoms of the initial stage are similar to those of acute catarrhal conjunctivitis, as for example, hyperæmia of the conjunctiva and exudative discharge, but the objective symptoms differ, in that the lids are excessively stiff, owing to plastic infiltration of the sub-epithelial and deeper layers of the conjunctiva, while the surface of the mucous membrane is smooth and of a greyish or pale-buff colour. The stage of infiltration lasts for a week to ten days and is the period of the gravest danger to the eye, for during this period, is corneal ulceration most likely to occur. Towards the close of this stage, the fibrinous infiltration is eliminated from the eyelids and the conjunctiva generally assumes a red and succulent appearance and a purulent discharge is established. This is the second, or the blenorrhœa stage. The third stage is formed by cicatricial alterations in the mucous membrane, which often lead to symblepharon, caused by the adhesion of the palpebral conjunctiva to the bulbar conjunctiva by a band of fibrous tissue

or xerophthalmos. It is thus seen, that even if the eye escapes corneal complications in the 1st and 2nd stages, others equally serious may await it in the final stage. The disease is nearly always associated with constitutional symptoms like fever, malnutrition, and albuminuria and is sometimes fatal. Very rarely it is followed by paralysis of the muscles of the extremities and even of accommodation.

TREATMENT:—Local : Should consist of washing the eye with antiseptic lotions like boracic acid or corrosive sublimate, opium drops (Ext. opii liquidum 3i to aqua distilla 3i) are instilled for stimulating the mucous membrane and relieving pain. In the initial stages, cold compresses are applied and warm fomentations later. In diphtheritic cases involving one eye, the other eye is protected from infection by a Buller's shield, which consists of a watch-glass lid between two layers of strapping in each of which a central circular opening is cut. The posterior layer, which is smaller than the anterior, adheres to the latter and to the concave margin of the watch-glass, while that part of the anterior layer, which extends beyond the margins of the posterior, adheres to the skin of the brow, temple, cheek and sides of the nose, the centre of the watch-glass lying over the eye. At the temporal side of the orbit, an opening is left for ventilation. In the cicatrization stage, castor oil or olive oil is dropped into the eye twice daily to prevent adhesion of the palpebral and bulbar conjunctivæ with formation of symblepharon.

In diphtheritic cases, a large dose of 8000 units of anti-diphtheritic serum is injected as early as possible and half this dose repeated every day for about four days or until there is marked improvement.

3. *Phlyctenular conjunctivitis* is a condition characterized by a circumscribed inflammation of the conjunctiva, with the formation of one or more small reddened projections called phlyctenules. The disease is very common in children, particularly those suffering from malnutrition and living in bad hygienic surroundings, and a constitutional tendency to a tuberculous diathesis is frequently present in these cases as also general debility resulting from the disease. Other manifestations of the predisposing diathesis as swelling of the cervical lymph glands, adenoids, eczema, blepharitis and chronic otorrhœa are also frequently present. The subjective symptoms are :—marked photophobia, when the cornea is involved; but very slight in simple conjunctivitis; there is considerable blepharospasm also in most cases as also considerable lachrymation, where the cornea is also involved.

The essential sign is the occurrence of one or more small greyish elevations or nodules, about the size of a millet-seed, at

some part of the bulbar conjunctiva or cornea and is most frequently seen at the limbus. The phlycten is surrounded by an area of conjunctival hyperæmia. The un-affected part of the bulbar conjunctiva is normal. The phlycten soon presents a small ulceration at its apex, which then occupies the level of the surrounding conjunctiva. It usually heals without leaving behind any change in the conjunctiva. The entire process lasts from a few days to 2 weeks. Generally a number of phlyctens appear at the same time with hyperæmia of the entire bulbar conjunctiva as also congestion of the palpebral conjunctiva. The nodules may get absorbed without going through the stage of ulceration. When the phlyctens appear on the cornea or in some cases at the limbus, they may ulcerate and spread into the superficial and epithelial layer, Bowman's membrane and the substantia propria of the cornea and produce a permanent corneal opacity, thereby reducing considerably the acuity of vision especially if the opacity is over the centre of the pupil.

Fascicular keratitis is produced by the spread of the phlyctenular ulcer from the margin to the centre of the cornea, drawing after it a fascicle of blood vessels. In this manner, a narrow, red band of vessels, extending some distance over the cornea is formed. The phlycten in severe cases, involves the deeper layers of the cornea forming deep infiltration, which may be absorbed completely or leave an opacity of the cornea. Rarely, it becomes purulent and a deep corneal ulcer results. The prognosis is favourable when the cases are treated early, before corneal complications set in or in the early stages of corneal infiltration. Otherwise corneal opacity is bound to result with a marked reduction in the acuity of vision.

TREATMENT:—In cases with marked conjunctival hyperæmia, irritation and discharge, the eyes are irrigated with boracic acid solution and an antiseptic ointment like Irgafen is applied. After the hyperæmia subsides, yellow oxide of mercury ointment (one per cent) is applied to the eyes once or twice daily. If there is infiltration or ulceration of the cornea, atropine ointment (one per cent) is applied once daily and hot compresses are applied over the eye. In cases of fascicular keratitis the advancing edge of the ulcer is cauterized by a galvano-cautery point or with tincture of iodine. Bandage should not be applied except in extreme cases of deep ulceration of the cornea. General systemic treatment is of great importance. Preparations of iron like Syrup Ferri iodide, or Easton's syrup and Cod liver oil as well as calcium internally are indicated.

4. *Corneal ulcers* :—Besides a few cases of phlyctenular ulcers and ulcers due to the presence of foreign bodies, the majority of cases of corneal ulceration are due to the application of irritant remedies to the eye by unqualified persons as treatment

for an otherwise harmless condition, *e.g.*, acute catarrhal conjunctivitis in children under the age of 12, which would get cured even without treatment if the eyes are kept clean and the discharge wiped out frequently with a piece of clean cloth soaked in warm water. The irritant remedies usually applied are the juices of leaves and flowers of certain plants in the erroneous and superstitious belief that they would miraculously heal by Divine grace! Extensive corneal ulceration is caused in both eyes and the unfortunate child completely loses his sight in both eyes or if it is lucky to be taken to an eye clinic before total ulceration of both eyes has resulted, at least one eye may be saved by efficient prolonged treatment. This state of affairs is seen mostly in rural areas but we come across such maltreatments even in towns and cities owing to the gullibility of many parents who permit this quackery to be practised on their children with disastrous results.

Suitable fresh legislation and severe penalties should be enforced in all States so that the practice of quackery and the resulting blindness may effectively be put an end to. Though reports are called for periodically by the Head of the Medical department from medical officers in charge of eye departments in eye hospitals in the State regarding the steps taken for the prevention of blindness, it is surprising that no steps appear to have till now been taken to tackle this problem, which would certainly have been mentioned in the reports. Notwithstanding the "*Anti-Couching Act*" in force, which is intended to punish quacks who do couching operation for cataract with a view to giving sight mostly to old people already devoid of sight, the pernicious practice has not been effectively checked. An "*Eye Protection Bill*" is urgently called for to punish offenders, who play with the valuable eyes of children by applying irritant remedies and ruining their sight.

A corneal ulcer starts usually with a slight infiltration of the cornea near the anterior surface, characterized by limited dullness and opalescence of the cornea. The opalescent area becomes limited, slightly raised and of a grey or yellowish colour. The epithelial layer, anterior to the focus of the inflammation breaks at the most prominent part, a portion of the corneal tissue comes away as slough, and an ulcer forms. The infiltration all round the floor of the ulcer are infected by streptococci, staphylococci, pneumococci, etc. The surrounding cornea is generally greyish or white and the less marked the infiltration area the less is the likelihood of the spread of the ulcer and *vice versa*. The ulcer tends to spread either laterally or in depth and when it tends to spread laterally, the edges are ragged and irregular.

The symptoms of corneal ulcer are photophobia and pain, especially on exposure to light. The pain is due to the exposure

of the twigs of the corneal nerves. Children suffering from this condition assume a characteristic posture, they shun light and prefer to sit in the darkest portion of the house, their heads buried in their hands, with the swollen lids tightly closed and tears streaming down their cheeks. The chief signs are swelling of the lids, lachrymation, pink circum-corneal vascular zone, which may be marked by extreme conjunctival congestion, a localized loss of surface of the cornea, seen best by focal illumination, infiltration of the surrounding cornea and sometimes blood-vessels passing to the ulcer. When repair sets in, cicatrization occurs, the corneal tissue being replaced by fibrous tissue, which in turn is covered over by epithelium, and becomes smooth, but never regains its original transparent structure and appearance. Except in very superficial ulcers, Bowman's membrane is destroyed at the site and replaced by scar tissue.

COMPLICATIONS AND SEQUELÆ:—The cornea at the site of a healed ulcer remains permanently less transparent than the normal. If the depth of opacity is slight and grey in colour, it is called a nebula, but if it is more opaque, non-translucent and markedly whitish in colour, it is termed a leucoma. When the corneal tissue is much weakened by ulceration, a staphyloma *i.e.* a bulging forwards of the cornea with the iris tissue also included in the cicatrix results, which is due to a prolapse of the iris in corneal ulcers, that have extended deeply and perforated. All such opacities and changes reduce the sight markedly particularly those occurring over the pupillary area.

In certain cases, the base of the ulcer has a dark appearance caused by the Descemet's membrane being exposed, and sometimes also protruding to form a *keratocele*—a hernia of Descemet's membrane.

Anterior polar cataract, due to corneal ulceration, occurs in infants, as the anterior chamber is markedly reduced and the anterior surface of the capsule comes in contact with the cornea, with consequent inflammation and thickening of the capsule and an opacity on the anterior aspect.

In all cases of perforated corneal ulcers, the iris tends to come forward and become adherent to the cornea at the site of perforation, giving rise to the formation of an *anterior synechia*. In other cases, on healing, a markedly white opacity remains at the seat of perforation with the iris adherent to it and is termed adherent leucoma. In untreated cases of perforation of the cornea, iritis and sometimes panophthalmitis may result.

TREATMENT:—In the early stages of corneal ulceration and especially when the ulcer is small, cauterization with pure carbolic acid or tincture of iodine is made after cocaineization and immediately followed by irrigation of the eye with Boracic

acid (10 grs. to an ounce) solution; mercurochrome drops and atropine ointment (one per cent) and Irgafen ointment are applied to the eye and the eye bandaged, if there is not much discharge. If there is much conjunctival discharge, the eye should *not* be bandaged, but tinted glasses given for constant wear, till the ulcer heals. If the ulcer is large and deep, cauterization is not done, but after irrigation of the eye with antiseptic solution, the drops and ointment above mentioned are applied and the eye bandaged. Cocaine, one or two drops (2 per cent) is also applied to the eye for the relief of pain and irritation. Penicillin drops (2000 units per cc.) is applied to the eye twice or thrice daily as also subconjunctival injections of penicillin 100,000 units per cc. of sterile distilled water, given once daily after cocainization of the eye. An important point to remember in the treatment of corneal ulcer is not to apply atropine to eyes with ulcers situated at the periphery of the cornea near the limbus, as a dilatation of the pupils would cause anterior synechia and a greater risk of the occurrence of prolapse of the iris, in case perforation occurs. In such cases, Eserine drops (2 grs. to 3 i) should be applied; by its miotic action, it would remove the iris from the neighbourhood of the ulcer and prevent prolapse. In all other cases, atropine ointment is applied as a rule. To relieve pain, blisters are applied above the eyebrow to produce counter-irritation or a liniment of iodine painted above the eyebrows. If the pain is very severe, leeches may be applied to the temporal region to afford relief; A.P.C. powders may be given internally, the dose being regulated to suit the age of the child. In phlyctenular ulcers of the cornea, antiseptic drops like mercurochrome, and atropine ointment (one per cent), Irgafen ointment, and ointment of the yellow oxide of mercury (one per cent) may be applied, the latter, only when there is not much conjunctival congestion. In addition, general systemic treatment *i.e.*, Cod liver oil internally and vitamin A intramuscular injections at least twice weekly. Faeces must be examined for worms, cysts or ova, and if present suitable anthelmintic treatment given. Most children showing signs and symptoms of phlyctenular conjunctivitis usually also harbour round worms, and so, santonin with calomel and sodium bicarb should be given in suitable divided doses, followed by a castor oil purgative. If constipation, anorexia or colicky pain in the abdomen are present but no worms, Pulvis Rhei Co with grey powder is given daily in small doses for 4 to 7 consecutive days.

5. *Interstitial or parenchymatous keratitis* occurs as a patch of diffuse cloud-like corneal opacity either in the centre of the cornea or at the periphery initially, later spreading to the rest of the cornea. There is vascular infiltration into the deeper layers of the cornea from the periphery around the limbus consisting

of vessels derived from the anterior ciliary. The condition is mostly due to congenital syphilis and occurs usually between the ages of 5 and 15, rarely after 30. Less commonly it is due to tuberculosis. When the opacity extends over the centre of the pupil, the vision is markedly reduced, sometimes there is only the perception of light. If left untreated, iritis with posterior synechia, opacities of the vitreates, cyclitis, chorioiditis, retinitis, accompanied or followed by optic neuritis, later proceeding to optic atrophy, commonly occur, causing total blindness (corneal staphylone may also occur). The keratitis usually involves one eye at first, and the other eye, later after some weeks or sometimes even months. The deep vascular infiltration into the cornea at the site of the opacity gives rise to a dirty or yellowish red discoloration to the patch of opaque cornea, known as Salmon-coloured patch, and may cover either the periphery, circumscribed sectors, or the whole cornea. After the infiltration has become generalized, the cornea is softened to a dense greyish or yellowish grey colour hiding the view of the iris with a marked reduction of vision. The surface of the cornea is steamy and resembles ground-glass. The progress so far is accompanied by irritative symptoms and lasts one to two months, after which the inflammation begins to subside. The periphery of the cornea clears up, the blood vessels become fewer, the irritative symptoms get less and the vision improves to some extent. This process may take a very long time even up to a year, the centre of the cornea being the last to clear up. In favourable mild cases, after a year or more, a very faint central opacity of the cornea alone remains. In some cases, the clearing-up process in the cornea may leaving a dense opacity with loss of useful vision.

Signs of inherited syphilis, such as a peculiar configuration of the skull (square forehead), the prominent frontal eminences and a depressed bridge of the nose), radiating scars at the angles of the mouth, scars in the mouth and pharynx, enlarged cervical lymph glands, nodes on the bones, and more or less impaired hearing leading in many cases to complete deafness, are also found in many cases. The permanent teeth are ill-developed, their angles rounded off with a crescentic notch, often in the free margin, occurring especially in the upper central incisor teeth and known as Hutchinson's teeth.

Subjective symptoms during the period of corneal infiltration and vascularization, are photophobia, lachrymation, pain and interference with vision, the intensity usually depending upon the severity of the process and the stage at which proper treatment is commenced. These symptoms gradually subside during the progress of absorption.

TREATMENT:—*Local*:—Atropine ointment (one per cent) and dionine drops one per cent are used in the early stages, as

TREATMENT:—Syphilis or the underlying cause of the condition must be treated and atropine ointment applied to the eyes. Fomentation and application of leeches over the eyebrows are used, if there is much congestion and pain in the eyes. Mercury inunction for some weeks, and potassium iodide internally in suitable doses are helpful. Complete rest to the eyes from near work and protection from strong light by dark glasses are important.

9. *Retinitis pigmentosa*, this most chronic form of retinitis affecting both eyes, usually starts in childhood or at puberty; it is usually hereditary, frequently associated with a history of consanguinity. It consists of atrophy of the retina with migration of pigment from the pigment epithelium into the inner layers.

THE SYMPTOMS are nightblindness (hemeralopia), concentric contraction of the field of vision, progressive loss of sight, terminating in advanced years in complete blindness. In early life, there is only a slight reduction in the extent of the field, in good light, central vision is normal. But in dim light, the peripheral areas of the retina do not react, and hence the patient has great difficulty to move about at night, in the initial stages, and later becomes completely blind by night. As age advances, the field of vision is contracted even in good light and finally central vision becomes poor and gradually total blindness results. Ophthalmoscopic examination shows black spots in the periphery of the fundus, of the shape of branching cells like bone corpuscles and are found especially along blood vessels. Gradually new spots form and the pigment circle approaches the optic disc. Choroidal vessels become plainly visible, in course of time. The optic disc and retina become atrophied. The optic disc presents an yellowish waxy appearance. The retinal arteries are very much contracted, and appear as mere threads. The fundus presents all changes in some cases except the presence of pigments. Frequently, other congenital defects, such as deafness, Laurence-Beidl-Moon syndrome are found to be present in association. Posterior polar cataract also may be found in this condition.

TREATMENT:—Vitamin A therapy in massive doses both orally as well as parenterally is of great value. Potassium iodide internally benefits some cases. Propaganda on the harmfulness of consanguineous marriages, which are usually responsible for such defects and diseases in children, is a positive educational measure to wean people from marrying among close blood relatives.

10. *Tuberculous choroiditis* occurs in the acute and chronic forms in children subject to tuberculous infection. The acute form is met with only in the late stages of acute miliary tuberculosis and tuberculous meningitis as small miliary tubercles,

pale pink or white in colour, surrounded by a retinal haze and oedema and situated near the optic disc and macula; so treatment is of no avail. The chronic form is found as a diffuse infiltration of large areas of choroid, or as a solitary tuberculous mass in the neighbourhood of the macula lutea, which may be mistaken for a glioma. It ends in the formation of scar-tissue with cessation of the inflammatory process or the inflammation may spread, resulting in the involvement of the retina and vitreous and even perforation of the globe.

TREATMENT:—In the chronic variety, tuberculin therapy is given as well as specific therapy for tuberculosis, supplemented by vitamins A and D.

11. *Myopic choroiditis*:—Owing to an increase in the length of the myopic eye and the thinning and bulging of the sclerotic in the neighbourhood of the optic nerve entrance, stretching of the choroid takes place. The effect of this is mostly seen at the temporal side of the optic disc as a myopic crescent or posterior staphyloma. In high myopia, there is usually a mottled and striped appearance of the fundus, first in one eye, which leads to detachment of the retina and later in the other eye also, due to a thinning of the choroid and atrophic choroidal patches may be found generally at the outer side of and near the disc, and are irregular in shape with pigmented edges. Yellowish white zig-zag lines are seen in the choroid, and are a grave sign indicating active stretching of the choroid and there may be sooty pigment changes at the macula. Vitreous opacities are also usually present.

Myopes, suffering from these choroidal changes, complain of a dull aching pain in the eyes, cloudy vision, floating spots before the eyes and metamorphopsia.

TREATMENT:—Consists in avoidance of near work, rest to the eyes, smoked glasses and proper out-door life with plenty of exercise. Mercurial treatment by inunction and oral administration is given and atropine drops are instilled into the eyes. High myopia usually results from a rapid progression of the defect from small uncorrected errors of myopia in the eyes subject to constant strain of near work in school-going-children, to very high errors of -15 to -20 D. Periodical medical examination of children at school, in order to detect among other things, any errors of refraction will be necessary; correction of defects in the early stage itself with proper advice regarding the wearing of suitable glasses for near and distant work must follow the examination. Suitable advice should be given to the school children as to the proper way of doing near work in good illumination, so as to prevent the occurrence of high errors of myopia.

12. *Squint or strabismus* is also a common affection occurring congenitally or developed during infancy and early childhood. It may be of either the paralytic or concomitant variety. Paralytic squint, due to loss of power of one or more muscles of the eyeball is but a symptom of an underlying affection and not a disease by itself. This may be due to lesions in various sites: (1) lesions in the orbit; (2) basic lesions at the sphenoidal fissure and at the base of the skull between the fissure and pons; (3) pontine lesions which may be fascicular involving the ocular nerve fibres in the substance of the pons, or nuclear attacking only the nuclei of the nerves in the aqueduct of Sylvius and floor of the fourth ventricle and (4) cerebral lesions due to lesions above the nuclei, in the internal capsule, corona radiata, or cerebral cortex.

Concomitant strabismus is a condition in which there is defect in parallelism of the visual axes, in the primary position of the eye-balls, and as the eyes are moved from side to side, the defective parallelism continues in the same degree and there is a defective fusion-sense also. The symptoms of paralytic squint are diplopia and giddiness, which are absent in the concomitant variety. Infantile disorders as convulsions, whooping cough, measles, fright, fall etc. often start the strabismus, due to a weakening of the controlling influence of the higher brain centres, at such times.

TREATMENT:—The paralytic variety usually needs operative treatment of advancement or recession at an early stage itself for the ocular muscle balance to become normal; while the concomitant variety which is due to a high error of refraction in the eyes, either hypermetropia or myopia of an equal degree or much more in one eye than the other, producing usually convergent squint in the former and divergent squint in the latter, should be treated by first correcting the error of refraction in the eyes by prescribing proper glasses for constant use. Sometimes an uncorrected high error of refraction in one eye leading to a squint, might progress to a condition of complete amblyopia or blindness in the eye, due to non-use of the eye for vision for quite a long time. Periodic exercise to the affected eye by excluding the other normal eye for vision in children by a shade would prevent the eye from becoming amblyopic and the vision might even improve. If there is no error of refraction in the patient with concomitant strabismus or if correction of the same does not restore normal ocular muscle balance, operative therapy for advancement or recession of the muscle according to the nature of the condition must be resorted to.

Prevention of amblyopia in the squinting eye by correcting the error of refraction at an early stage in children and advice regarding the proper use of eyes in near work together with

periodical exercises to the squinting eye for vision in the initial stages excluding the normal eye from vision for some time daily, is very important. Continuous squint involves weakening or loss of visual function and the younger the child, the more readily does it occur. The sense of fusion not being exercised at all, is gradually lost and proves irrecoverable, a few years later, even though the eyes are put straight, by operative or other procedures.

13. *Optic neuritis*:—Inflammation of the optic nerve occurs in childhood due to congenital syphilis or following tuberculous meningitis or cerebro-spinal meningitis. Fevers like influenza, malaria, measles and typhoid are likely to produce optic neuritis, leading to optic atrophy. Optic neuritis is characterized by hyperæmia and swelling of the optic disc with haziness of its margins, increase in the size of the central vein and contraction of the central artery. In cases of severe neuritis the optic disc is greatly swollen and greyish striæ extend from the margins of the optic disc to the surrounding retina; flame-shaped hæmorrhages are seen surrounding the optic disc and sometimes white spots in the retina involving the macula lutea also. The vision is not affected usually to the extent indicated by the ophthalmoscopic changes seen. In some cases of neuritis, vision is very much reduced and the ophthalmoscope shows only a slight haziness of the margins of the optic disc, whereas in certain other cases presenting marked ophthalmoscopic changes, the vision remains normal or very nearly so. Even though visual acuity may be normal there is contraction of the field of vision in one quadrant or other from the early stages. Even though the optic nerve becomes normal after treatment, some contraction in the field of vision persists in most cases of neuritis.

TREATMENT is for syphilis or tuberculosis. Potassium iodide and mercury are given internally. If there is anæmia, iron in the form of Easton syrup or Syr. Ferri iodide is given.

14. *Hereditary optic atrophy*:—Starts with a sudden and marked loss of sight involving both eyes and leading to blindness. Only a slight optic neuritis is present in the early stages. After a few weeks, the papilla becomes pale, especially in its temporal half and gradually the typical appearance of optic atrophy is produced. The disc is markedly reduced in size with the vessels extremely constricted, so as not to be even barely visible. Hereditary transmission occurs through the females transmitting the affection to their male children alone, themselves being free from it.

TREATMENT:—Mercury and Potassium iodide internally and strychnine parenterally, are given.

RECURRENT APHTHOUS ULCERATION OF THE MOUTH

Sircus, Church and Kelleher have reviewed the literature on this disorder and have given a thorough account of the frequency, symptoms and treatment recorded on themselves. They state that the buccal lesions are frequently associated with similar ulceration elsewhere, and lesions on the genitals, eyes and skin have been noted without buccal lesions. 1000 patients consecutively attending out-patient clinics of the Royal Infirmary, Sheffield, were questioned, and those who admitted to having had the disorder were referred to Sircus and his colleagues. At the same time 587 patients at the Western General Hospital in Edinburgh were questioned, as well as 151 patients in a private practice. The overall incidence for all ages and both sexes in the 1738 patients questioned was 335 (19.3%), so the condition is a common one. 120 patients with ulceration were studied in detail. The highest incidence of onset in both sexes was in the second decade. In 10% of the female patients the first attack occurred between the ages of 50 and 59 years. There appeared to be a rhythmical periodicity in the attacks in most subjects, but at shorter intervals in the female. In some of the patients the disorder had recurred over a period of more than 40 years. A study of factors precipitating attacks showed that mental stress of some form preceded the attacks, and local trauma often played a part. The commonest sites of the ulcers were inside the cheeks opposite the upper molars and inside the lips. Involvement of vulva or vagina often occurred.

A remarkable diversity of treatment is seen in published accounts of the disease, but none of them seem to have been very effective. In this series folic acid, nicotinic acid, riboflavin, vitamin B complex, ethisterone, cortisone, locally administered "Aureomycin" and radiotherapy were tried in the best approved methods for testing drug activity. No significant change in the progress of the disease was seen, except with radiotherapy, from which one patient had a complete remission for three months, and another obtained partial remission from local application of a suspension of "Aureomycin". In the latter case there was no change in the number or frequency of the ulcers, but considerable analgesic effect in all cases. A thorough investigation was made as to the relation of the condition to *herpes simplex* and to a virus aetiology. It was established that there was no relation to *herpes simplex*. No virus was grown on chick egg membrane.

The condition is very much more common than is usually believed. The fact that thorough study has failed to provide any evidence regarding aetiology, and the almost complete failure of all modes of treatment tried, with the exception of the relief afforded by "Aureomycin", are to be deplored. The condition is one which could form a useful study for the practising medical men.—(*Med. Jour. Austral.*, 3-8-1957).

CATAMENIAL PATTERN OF EPILEPTIC SEIZURES

In some female epileptic patients, incidence of seizures varies with the phase of menstrual cycle. Convulsions are most frequent immediately before, during, and after menstruation and least common during the luteal stage, four to thirteen days before menstruation begins. Relationship between seizures and menstruation was determined for 50 patients. In 28%, no correlation was evidence; in the remaining 72%, significant catamenial influence was noted. The midluteal reduction in seizures, but not the menstrual increase, was especially pronounced when only regular menstrual periods were considered. Possibly, progesterone secreted during the luteal phase protects the patient against fits, increase in frequency of seizures during menstruation is attributable to withdrawal of this protective agent. Tests with experimental animals indicate that progesterone does exert some anticonvulsant effect.—(*Lancet*, 271: 1235-1237, 1956).

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RURAL HEALTH*

R. BHASKER RAO, M.B., B.S., B.S.Sc.,
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Kasturba Medical College, Mangalore-1, S. India

THE problem of rural health in India is a very important and stupendous one, considering the fact that India is a land of villages where more than 80% of the population resides, and will need all the energy, imagination, resources and constructive abilities of the popular Government backed by the zeal and enthusiasm of the public and the selfless interest shown by the medical profession as a whole.

Health is not merely freedom from disease, but it is a positive state of well-being in which the mind and body always function to their fullest capacity. The State of the public health determines the extent of a nation's development and progress. The expenditure of money and effort in improving the nation's health is therefore, a gilt-edged investment which will yield handsome dividends.

Many advanced countries of the west, whose state of public health a few decades back was no better than ours of today have been able to wipe out most of the communicable diseases from their midst and raise their standards of nutrition, housing, and the average expectation of life; and there is no reason why we should not be able to do the same, given the necessary facilities and funds. The death-rates, infant mortality-rates, and maternal mortality-rates in India are among the highest in the world, and the average expectation of life at birth is less than half that of some of the advanced countries. 54 out of every 100 born in our land ever reach the age of 15. Of those who reach young adulthood all but 15 die or are incapacitated before they complete their normal span of 60 years, while 92 out of 100 reach the age of 15 and 70 persons live up to 60 in some advanced countries. Many communicable diseases are still with us. Probably less than 10% of the population is served by a protected water supply. In nearly all the rural areas and many urban ones there are no proper drains for the removal of waste water nor is there a regular service for the removal of filth and refuse outside the village to a safe place designed for their proper disposal. Defective nutrition either from lack of knowledge or due to economic reasons is widely prevalent resulting in under-nourishment or mal-nutrition. Both these are calculated to impair health.

The essential requirements for the maintenance of public health are:—a healthy environment, adequate nutrition of the correct type, and proper standards of living. Insanitary conditions are the rule all over the country. It is indeed a paradox

* Specially contributed to the ANTISEPTIC.

that while Indians are individually one of the cleanest people in the world, the average Indian home also being fairly clean, community hygiene and cleanliness are exceedingly defective.

In olden days, every village was self-sufficient economically, the joint-family system, and hereditary occupations, contributing towards this self-sufficiency. With the impact of modern civilization, rural economy and self-sufficiency have been totally upset, in fact shattered out of existence.

Agricultural indebtedness, unemployment and poverty have overtaken the Indian peasant. The incidence of diseases is greater amongst persons of the lower-income group, which shows that there is a close relation between financial soundness and the ability to ward off disease and death.

Illiteracy amongst the masses is very high. Without some amount of general education it will not be possible to impart health education and inculcate a sense of responsibility in the house owner towards his neighbour. Lack of education favours the existence of superstition. This, along with a childish faith in fatalism has made the average Indian peasant apathetic to his surroundings. Ill-health and disease are stoically accepted as inevitable! In any campaign against ill health, it will be necessary to overcome this fatalistic attitude and enlist the active co-operation of the people in the elimination of disease by greater attention to personal and community hygiene. The *pardah* and early marriage systems also play an important role in the incidence of disease. The system of *pardah* works a great hardship, particularly amongst the poor who are unable to afford the luxury of enclosed parks or grounds for recreation. The incidence of tuberculosis is very high among them. Early marriages besides being responsible for a high birth-rate with all its attendant evils exert a baneful influence on the health of the young mother.

Apart from our efforts to wipe out malaria, filaria, tuberculosis, leprosy, the control of infections and communicable diseases by raising the standard of living, improvements in the nutrition-standards of the people through a suitable dietary, and the improvement of the environmental hygiene of the people will be very important measures, for banishing ill-health from the country. This will of course mean the provision of suitable housing, sanitary surroundings and a safe drinking water supply. Without these essential requirements our villages will continue to be factories of disease, helping to maintain undiminished the demands on the curative side of the medical services.

In addition to the above a vigorous and healthy community life in its varied aspects should be catered for. "No one can live by bread alone. Recreation, mental and physical, plays a large part in building-up the conditions favourable to sound individual

and community life. Every child should have the right to be ensured a fair chance of living a normal healthy life and of contributing eventually his or her full share to the general advancement of the community. This will entail the proper care of expectant mothers and provision of adequate antenatal, natal and post-natal attention. The child during every stage of its journey towards adult life needs suitable care and attention. Its nutrition, its health care, health education, physical development, should all be the concern of the state, which should make for the failure of parental effort. When the necessity arises for medical attention for the individual, there should be an adequate Health Service to turn to. The service should be so designed as to provide for every one who wishes to use it a full range of health care. For those who make use of the service, it should be able to offer as and when required the care of a family doctor, the skill of a consultant, laboratory service, treatment in hospital, specialized clinics, dental and ophthalmic treatment, drugs and appliances."

The State must provide the above amenities for which there should be adequate trained personnel. It will thus be realized that the war against disease has to be waged relentlessly on several fronts and every one has to play his part in this campaign.

The Government of India have not been idle. Although 'Health' is largely a state subject under the constitution all health plans have been carried out as a joint-endeavour by the Central and State Governments, the actual execution of the plans being carried out by the latter. Hence the inevitable delays. The Union Government is directly responsible, under the constitution, for international health, control of infectious diseases and standards of higher technical education. The National Malaria control programme, under which the major portion of the vulnerable population has been protected is paying handsome dividends and the malaria patient is fast becoming a rarity.

Tuberculosis, leprosy and filariasis are also receiving the attention of Government. Numerous colleges and other institutions for the training of medical men and technical personnel are being started all over the country. The provision of an integrated curative and preventive health service in the rural areas is a ticklish problem and I will here content myself with the observation that most of the State Governments seem to be alive to the problem. What is needed is a sufficiently attractive scale of pay with suitable amenities to induce the right type of persons to join the rural health services. The rural doctor should be well-versed in both preventive and curative work, and the agencies for carrying out such integrated work in future will be

the Health Centres in charge of medical men assisted by other ancillary staff like the woman medical officer, health-visitor, and health inspectors. The entire rural area should be covered by such Health Centres. At the Taluk Head Quarters and the District Head Quarters there should be hospitals with necessary beds and a competent staff of specialists. The specialist who will perform certain specific duties will still be there. This is the type of 'Rural Health Service' that I have in mind. Schemes for protected water supply and drainage are being subsidized by the Central Government on a priority basis. Family-planning has come to stay as part of the policy of the Central and State Governments.

Measures to improve environmental hygiene in the villages may be considered under the following heads:

I. (a) Village planning; and (b) housing.

II. (a) Water supply; (b) general sanitation including conservancy and drainage; (c) river and beach pollution; (d) control of vectors of disease and the (e) control of dangerous and offensive trades.

The objective in village planning should be to utilize all the available land to the best advantage of the community as a whole, by making provision for all its needs and amenities, residential areas, recreation grounds, places of amusement, markets, schools, centres of worship and the location of industries in such a manner that there is no nuisance to the community. Almost all the villages in our country have grown up without any planning. There are no proper streets. Residential areas are mixed up with industrial areas. Slums flaunt themselves cheek by jowl with pucca dwellings. In trying to set up a new order, one has to contend with the evils due to tradition, ignorance and poverty. It would therefore, be very proper to have a suitable administrative agency provided with technical advisers and funds in order to remedy the present defects. Suitable standards for housing should be insisted upon. At present most of the houses are lacking in ventilation, lighting and space. Smokeless ovens should be built in the kitchens to prevent smoke nuisance. Tenement houses are very common. There should be housing projects and co-operative societies financed by Government, to carry out housing schemes. Building rules should be properly enforced by the local authorities. The use of single-room tenements by a family should be prohibited. There should be 2 living rooms with a separate kitchen, bathroom and latrine. Every house should have a small backyard for the disposal of manure and refuse. Where there is sufficient land and the owner is able to afford the cost, there should be adequate provision for proper excreta disposal with suitable water carriage system, small

septic tanks and soil-absorption systems for the effluent. Otherwise the ordinary leeching type of borehole with squatting slab and water-seal situated in the backyard with a reasonable and cheap superstructure will serve the purpose. In order to encourage the construction of such private latrines several local authorities have initiated schemes to subsidize wholly or in part the cost of squatting slabs, boring and the water-seals. A proper scavenging service for trenching night-soil (collected from areas not provided with proper latrines) and the rubbish from the streets and private houses is also necessary. The slab and water-seal should be made of either porcelain or cement. Wastewater from each house should be drained into a soak-pit in the backyard, so that it does not become a nuisance. Where there are trees and plants, much of the waste water can be diverted to them. Common manure pits for the whole village should be encouraged. Villagers owning cattle must be trained to compost their cattle manure. The problem of rural protected water supply is a very big problem. Probably a central organization assisted by provincial boards with statutory powers, technical advisers and laboratory service will furnish the solution. For small villages a properly constructed well, protected against surface and subsoil pollution and provided with pumps would be the ideal. For the larger ones piped stand-post systems must be provided. It will be the duty of the village panchayats to enforce the various standards and arrange for community services with the help of suitable staff. The Panchayats should be made financially self-supporting. Community projects afford a splendid opportunity for making the people health-conscious, and for initiating measures for the amelioration of ill health through self help.

I have briefly indicated in this paper the present state of public health in our country, the obstacles in the way of banishing ill-health, and the steps that should be taken to improve it.

SILVER NITRATE PROPHYLAXIS FOR OPHTHALMIA

Among 67,200 live births during the course of 10 years in a large general hospital (Los Angeles General Hospital), 40 infants developed gonococcal ophthalmia neonatorum despite silver nitrate prophylaxis. Silver nitrate 1% drops were used routinely in the eyes before the infants left the delivery room. A resident, intern, or medical student held the eyelids apart while a nurse put in the drops. Gonococcal ophthalmia developed in 1 infant who received prophylaxis under the supervision of a resident to demonstrate to some medical students a proper method. Prematurity increased the risk of infection. Two infants had active gonococcal ophthalmia at birth. This presumably is a result of the generally poorer resistance to infection by the immature foetus. The occurrence of active gonococcal ophthalmia noted in 2 infants at birth and as quoted elsewhere demonstrates that postnatal prophylaxis can be futile. Such an event must be extremely rare, however.—(Harold E. Pearson, M.D., *Am. Jour. Obst. Gyn.*, April, 1957, via *Current Medical Digest*).

ANAPHYLACTOID REACTION TO PENICILLINS V AND G ADMINISTERED ORALLY

"It is now well known and frequently reported that anaphylactic reactions to parenteral injections of penicillin occur and that the mortality may be as high as 30%. There is, however, less awareness of the fact that this type of reaction can also be caused by tablets, lozenges, aerosol spray, paranasal sinus irrigation, ophthalmic ointment, contaminated syringes and skin testing. A review of the medical literature in English up to the present time reveals 9 cases actually reported and 2 others alluded to, that were due to oral tablets, in addition to 2 cases due to lozenges. Maganzini reports two cases of acute anaphylactic shock due to penicillin administered orally.

"Penicillin is the most common cause of drug sensitivity today, surpassing even foreign serum in the production of fatal anaphylactic reactions. The frequency and to some extent the severity of untoward reactions depend on the route of administration, type of penicillin preparation used, allergic background of the patient, age, previous administration of penicillin and the length of time since the last dose. In general, reactions to parenteral administration of penicillin can be expected to occur in 2 to 2.5% of children, 5% of nonallergic adults and 15% of allergic subjects. It has been noted that allergic reactions are much more frequent in persons previously exposed to penicillin on subsequent administration than in those who have never previously received the drug."

In an atopic person who has previously had penicillin, the possibility of an anaphylactic reaction is approximately 1 : 6 and this is increased if a previous penicillin reaction has occurred.

"Treatment consists in the immediate administration of epinephrine intramuscularly or intravenously if shock is developing, the establishment of a free airway, oxygen if available and intravenous or intramuscular administration of pressor substances for shock and aminophylline for bronchospasm. In addition, epinephrine applied at the site of injection and a tourniquet above the area should be used if the reaction is from parenteral administration. After this, parenteral steroids and anti-histaminics should be given."—(*New England Journal of Medicine*, 256 : 52, January 10, '57).

ANTICOAGULANTS

The use of anticoagulants is of established value in pulmonary embolism, phlebitis, myocardial infarction, and embolization in rheumatic heart disease. It is of value in the prevention of thromboembolic complications after cerebral thrombosis. It is of probable value in the prevention of impending myocardial infarction. It is under experimental study in the treatment of acute cerebral thrombosis and in impending cases of this disorder. There have been improvements in heparin administration. New, effective oral anticoagulants are available. Vitamin K₁ is of value as an oral antidote. The use of trypsin given parenterally is not recommended....

Anticoagulant therapy should be undertaken only by physicians who have mastered the technique. They must be willing to devote the time and effort needed to follow each case in minute detail. A reliable laboratory must be available. Only intelligent, cooperative patients should be given long-term therapy. The patient must be tested frequently. Antidotes must always be on hand. The physician cannot take a day off or a vacation unless he is covered by another physician equally skilled in the technique of this therapy.—(*Med. Clin. of N. Am.*, Sep. 1956).

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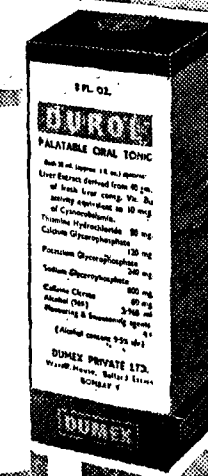
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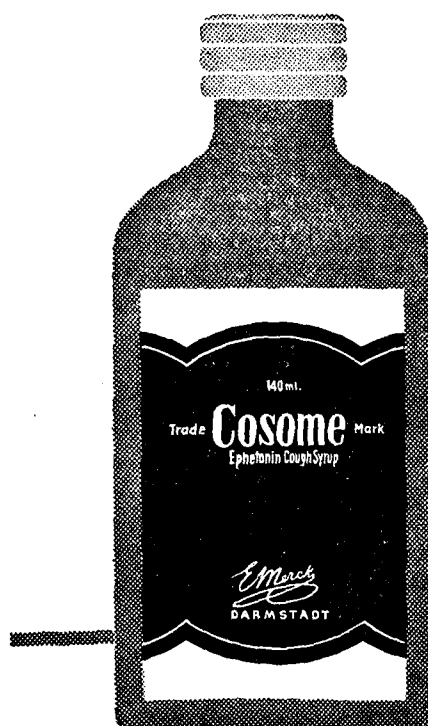
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A NOTE ON THE HYPOGLYCAEMIC EFFECT OF TOLBUTAMIDE*

(N'-n Butyl-N³-p-Toluene Sulfonyl Urea)

in Laboratory Animals

S. L. MUKHERJEE, J. S. CHOWHAN, AND S. P. SEN,

From the Pharmacological Section, Albert David (Laboratories) Ltd., Calcutta

THE two sulphonyl urea compounds of closely related chemical structures, Carbutamide, $\text{NH}_2 \cdot \text{SO}_2 \cdot \text{NHCONHC}_6\text{H}_5$, and Tolbutamide, $\text{CH}_3 \cdot \text{SO}_2 \cdot \text{NHCONHC}_6\text{H}_5$, have, during the last two years been reported to possess significant hypoglycaemic properties. These compounds have been extensively investigated by Achelis and Hardebeck¹, Betram and Bendfeldt², Franke and Fuchs³, Stotter and Creutzfeldt⁴ and reported to give satisfactory clinical results in certain type of diabetes mellitus. Like other sulphonamide derivatives Carbutamide possesses certain antibacterial properties⁵ which are absent in Tolbutamide. The absence of these antibacterial properties stimulated interest in further studies on Tolbutamide. It is generally observed that Tolbutamide is the less toxic of the two compounds but with equally hypoglycaemic action and therefore, shows greater promise for prolonged use. Extensive pharmacological studies on Tolbutamide were conducted by Scholz and Bander⁶, Creutzfeldt and Flinter⁷, Creutzfeldt and Bottcher⁸, Kummerle and Creutzfeldt⁹ upon the normal, artificially induced diabetes and depancreatized animals respectively. Scholtz and Bander (*loc. cit*) studied the general pharmacology in relation to the effect on blood-sugar lowering-action, toxicity and minimum lethal dose as also the general systemic reaction.

The mechanism of action of tolbutamide is not yet sufficiently understood but it has been postulated that the drug diminishes the endogenous formation of glucose without altering the rate of utilization of administered glucose. It is not likely that it acts as an inhibitory agent on insulin antagonists (Craig and Miller¹⁰).

Until very recently tolbutamide was not available in India and we are presenting the pharmacological observations on the Tolbutamide as synthesized in our laboratory. Further studies along this line are in progress and will form the subject of a future communication.

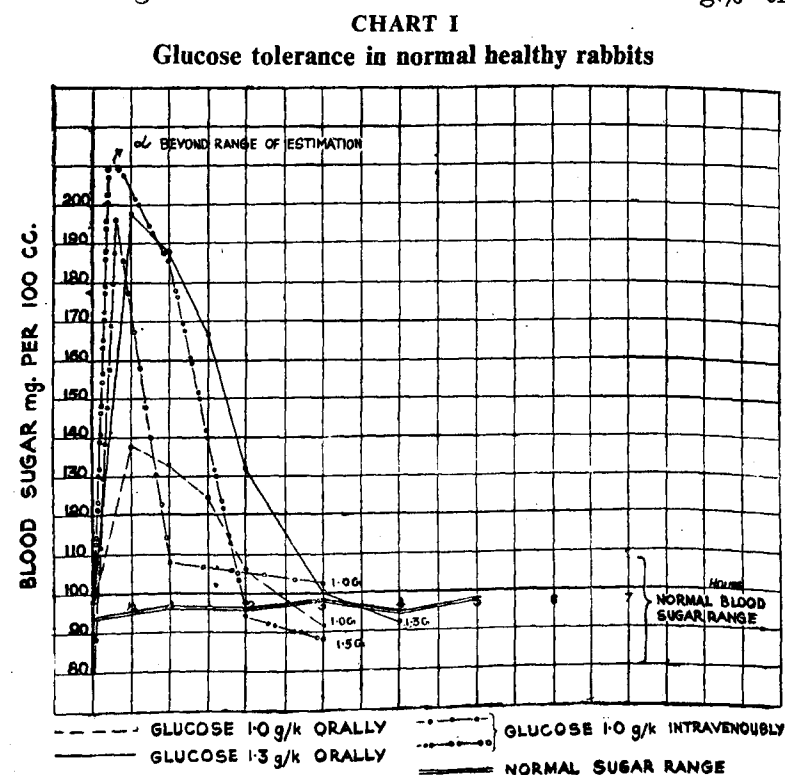
Experimental procedure:—Batches of locally bred male rabbits weighing between 1.3 to 1.8 kg. were selected, and kept under uniformly healthy laboratory conditions. They were fed on 250 g. of soaked germinated black-gram and a handful of green grass and water *ad lib*. The animals of the experimental batch were starved for about 15 hours prior to the experiment although

*Specially contributed to the ANTISEPTIC

sufficient water was left in their cage both during the starvation and the experimental periods. Blood specimens were drawn from the ear veins of the rabbits immediately before the administration of the drug and subsequently at 1, 2, 3, 4, 5, 6, 7 and 8 hourly intervals. In some cases observations were extended up to 24 hours after the administration of the drug. Food was given to the animals after the last blood specimen was taken. Blood-sugar estimation was carried out using the Hegedorn and Jhensen method.

In most of the experiments a solution of the drug was made with the requisite amount of sodium bicarbonate solution, (the pH ranging from 7.6 to 8) for oral administration and in a few experiments a 5% suspension of the drug in 1% gum tragacanth was used. The animals were watched throughout the experiment to make certain that the drug had not been rejected through vomiting.

Normal blood-sugar in control rabbits:—Before studying the effect of the drug on the blood sugar, the normal blood-sugar range was estimated in a batch of 10 healthy normal rabbits (see Table A, p. 43 and Chart I, below). It will be seen that the average blood-sugar in rabbits was between 94 to 98 mg.% the minimum



being 80 and the maximum 109 mg.% under the conditions of the experiment. **Glucose-tolerance curve in normal rabbits:**—The effect of glucose on the blood-sugar of rabbits was next studied. Glucose was administered orally in solution in doses of 1.3 and 1 g/kg. and intravenously 1 g/kg. It will be seen from the table that with a dose of 1.3 g./kg. orally,

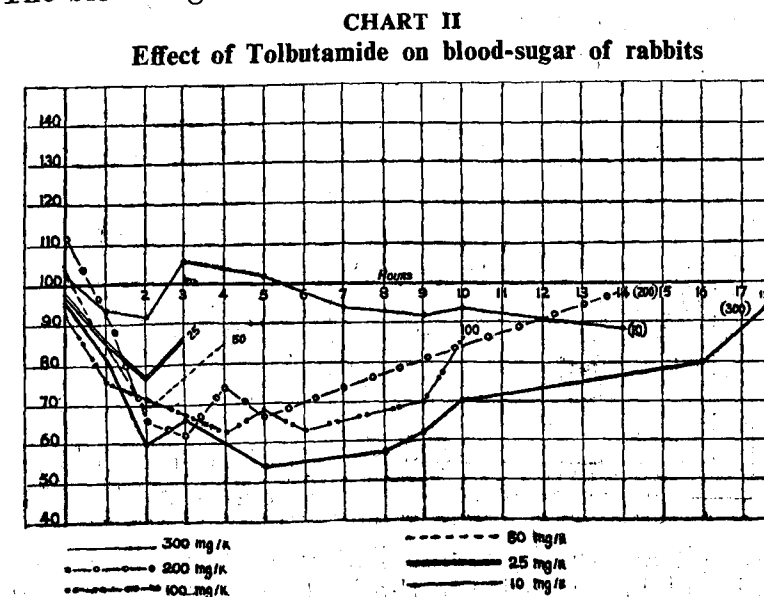
the blood sugar shot up from 92 to 198 mg. (+ 115%) and 189 mg. (+ 105%) in $\frac{1}{2}$ and 1 hour and returned to normal level within 3 to 4 hours. With a dose of 1.0 g. kg. orally it rose from 98 to 139 mg. (+ 42%) and 133 mg. (+ 36%) in $\frac{1}{2}$ hour and 1 hour respectively and returned to normal in 2 hours. In the case of intravenous administration of glucose in dose of 1 g./kg. the rise of blood sugar was from 80 to 196 mg. in 15 minutes and returned to normal within 1 hour and with 1.5 g./kg. the blood-sugar rose beyond the range of assay within 10 minutes returning to 185 in 1 hour and to normal before 2 hours (see Table B, p. 43 and Chart I, p. 38).

Effect of Tolbutamide on the blood-sugar of rabbits:—Dose: 300 mg/kg. (see Table C, p. 44 and Chart II, below):—The drug was administered orally to 3 rabbits and blood specimens were drawn immediately prior to and subsequently after the administration of the drug as already detailed. The blood sugar was seen to drop from 96 mg.% to 82 mg.% (–14%) during the first hour the maximum drop (–43%) being in the 5th hour which was maintained up to the 8th and 9th hour; and then it generally returned to normal after the 19th hour.

Dose 200 mg./kg (see Table C, p. 44 and Chart II, below):—Three rabbits received a dose of 200 mg/kg of tolbutamide; the fall of blood-sugar was slow at the onset (–15.7%) and reached the maximum during the 2nd and 3rd hours –40 and –44% and (–32%) in the 7th hour. The blood-sugar returned to normal after 14th hour.

Dose 100 mg/kg and 50 mg/kg (see Table C, p. 45 and Chart II, alongside):—

With a dose of 100 mg/kg. the effect on the blood-sugar level was very nearly the same as above except that it was more moderate—the fall of blood-sugar being from 94 to 76 mg. (–19%) during the first hour, the maximum 63 mg. (–30% and –28%) being in the 4th and 6th hours, returning almost to normal after the 10th hour.

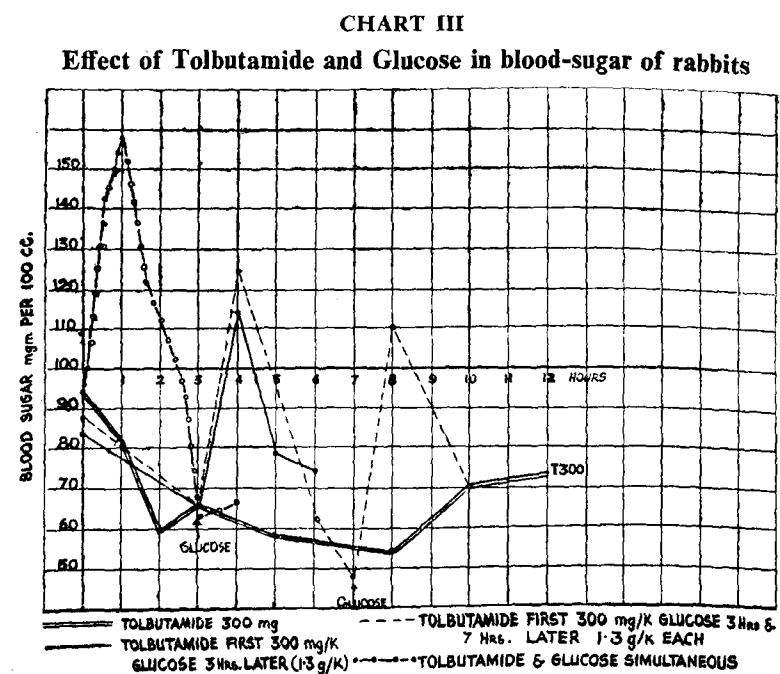


With a dose of 50 mg/kg orally the blood sugar fall on an average was about (-15%) in the first hour it was (-35% and -26 per cent) in the 2nd and 3rd hours respectively and reached nearly to normal in the 4th and 5th hours.

Doses of 25 and 10 mg/kg:—With 25 mg/kg of tolbutamide orally administered 3 rabbits (see *Tables C₅ and C₆*, p. 45 and *Chart II*, p. 39) the blood-sugar fall was less marked and less steady. The blood-sugar-lowering effect remained up to 5 hours. With 10 mg/kg the effect on blood-sugar was only nominal and the fall was noted for 2 to 3 hours only. Therefore, 25 to 50 mg/kg may be considered as the minimal therapeutic dose for blood-sugar-lowering-effect in rabbits.

Chart II will bear out the fact that the minimum effective doses of tolbutamide in rabbits lies between 25 and 50 mg/kg. These doses produced a definite but moderate fall of blood-sugar within 2 to 3 hours and the blood-sugar recovered its normal level after 5th and 6th hours whereas 100 mg/kg produced the same effect but the effect continued for a longer period.

Effect of Tolbutamide on the sugar tolerance of normal rabbits.—Attempts were made to see the effect of the oral



administration of Tolbutamide on the blood-sugar of animals after giving a glucose load. This effect was studied (a) on giving simultaneously a large dose of Tolbutamide mixed intimately

with glucose (b) by giving Tolbutamide 1 and 2 hours later and (c) 1 and 2 hours prior to the feeding of glucose (see *Table D*, p. 46 and *Chart III*, above). *Table D*, shows the blood-sugar level in rabbits when 1.3 gm/kg of glucose was administered simultaneously with 300 mg/kg of Tolbutamide. It will be seen (average of 3 animals) that the blood-sugar rose from 88 to 145 and

159 mg. within $\frac{1}{2}$ and 1 hour respectively and then began to fall to 123, 100 mg. and rapidly returned to normal in $2\frac{1}{2}$ hours. The blood-sugar then began to fall to 63 and 65 mg%, below normal in the 3rd and 4th hours. With a smaller dose of Tolbutamide (50 mg/kg) the blood-sugar rise was more (171 mg.) and later the fall was to a less extent, as was to be expected. This initial rise of the blood-sugar in both cases was almost identical with the sugar tolerance curve of glucose 1.3 to 1.0 gm. per/kg. in normal rabbits. It also shows that Tolbutamide had no immediate effect, but only 4 hours of oral administration its effect was noticed. Same results were noted when Tolbutamide was administered 3 hours after glucose.

In another batch of rabbits the drug was given with glucose in similar doses as above with this difference *viz.*, that the drug was administered 3 hrs. and 1 hour prior to a dose of glucose. This was done with a view to allowing a fair concentration of the drug in the circulation before the feeding of glucose in order to see how the animals tolerated the glucose when the drug was already present in the circulation. In *Table D₅*, p. 46 and *Chart III*, p. 40, it will be seen that the blood-sugar had dropped to 66 mg. (-20%) in the 3rd hour. At this moment glucose was fed and the blood-sugar rise was only 115, 78 and 73 (+38%, -6%, -12%) in the 4th, 5th and 6th hours respectively. This shows that when Tolbutamide is present in the circulation in the animals recently fed with the carbohydrate. In another similar experiment glucose was fed to the animal at the 3rd and 6th hour after a dose of tolbutamide. It will be seen in *Chart III*, p. 40 and *Table D₅*, p. 47 that even after the 2nd dose of glucose there was only a nominal rise of blood-sugar. Since there was enough concentration of tolbutamide in the blood the animal could safely take the 2nd and 3rd dose of glucose without any marked rise in the blood-sugar.

Combined effect of Insulin and Tolbutamide (D 860) in the blood-sugar of rabbits:—In a batch of two rabbits under the experimental conditions previously described, one unit per kg. of crystalline globin-insulin was injected subcutaneously. It will be seen (see *Table E*, p. 47 and *Chart IV*, p. 42) that the blood-sugar fall was -36%, -39%, 35% and -10% in $\frac{1}{2}$, 1, 2, 3 and 4th hour respectively and returned to normal in the 6th hour. In another batch of 2 rabbits the same dose of insulin was injected immediately after feeding glucose 1.3 gm/kg: The blood-sugar rise was 22% in half an hour and it fell to -12%, -13% and -6% in the 1st, 2nd and 4th hours respectively and reached normal in the 6th hour. The effect on blood sugar was next studied when the rabbits were given insulin and glucose simultaneously in the same doses as above along with 100 mg/kg of tolbutamide. It will be seen that the

blood-sugar rise in these animals was the same as above but the blood-sugar fall continued progressively to the 4th and 6th hour (-25% and -33%) instead of returning to normal in the 4th hour as in the previous experiment. This effect was more marked with 300 mg/kg of tolbutamide.

Discussion.—A series of experimental observations on tolbutamide, synthesized in our laboratory have been reported above. A dose of 300 mg/kg of tolbutamide fed orally reduced the blood-sugar level to the extent of 30 to 40 mg% in 3 to 4

hours. This fall was maintained up to 8 to 10 hours and then gradually returned to normal in 15 to 25 hours. Twenty five and 50 mg/kg produced a fair fall of blood-sugar while 10 mg/kg showed only a nominal effect on blood-sugar fall. There was not much deviation in the blood-sugar fall in the case of animals starved for a long time except that the blood-sugar remained low for a longer period. When tolbutamide was administered simultaneously with glucose or when it was fed 2 to 3 hours, after glucose it failed to control the rapid rise of blood-sugar. On the other hand, when tolbutamide was administered 2 or 3 hours prior to a glucose feed the blood-sugar rise after glucose was not marked and the peak was 38 mg% in the 1st hour and then the blood-sugar began to drop and reached -6 mg% and -12 mg per cent in the 2nd and 3rd hours respectively. When the feeding of glucose was repeated twice to such animals in the 3rd and 6th hour, no marked rise of blood sugar was seen and it remained fairly near the normal level (see Table D, Chart III).

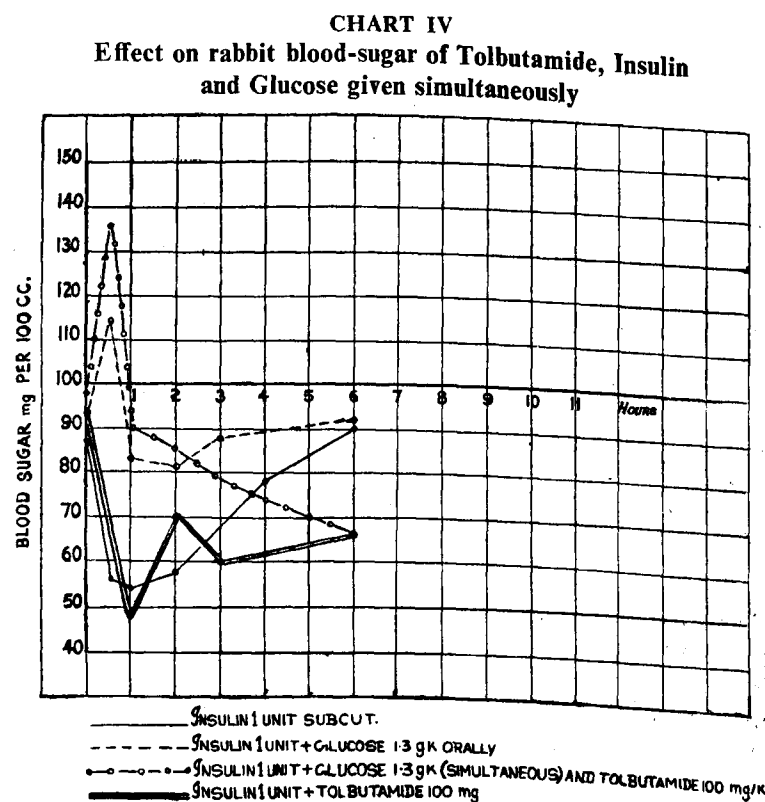


TABLE A
Normal blood sugar range in healthy rabbits

Sl. No. of Rabbits	Weight in kg.	Drug mg./kg.	Blood-sugar level at different intervals in mg. %										Remarks
			0 hr.	1 hr.	2 hrs.	3 hrs.	4 hrs.	5 hrs.	6 hrs.	7 hrs.	8 hrs.	9 hrs.	10 hrs.
13	1.4	x	99	90	93	102	107	96					
14	1.35	x	107	104	110	109	97	99					
10	1.43	x	109	100	98	102	99	101					
15	1.68	x	98	97	99	101	92	95					
16	1.57	x	93	107	103	109	102	107					
19	1.45	x	86	88	92	90	95	97					
3	1.5	x	88	92	81	95	80	80					
16	1.57	x	84	103	99	83	87	105					
Average			95	97	97	98	94	98					
													109

This rabbit was not given food for 28 hrs. Expt. started after 18 hrs. of strict fasting.

TABLE B
Glucose tolerance in normal rabbits

Sl. No. of Rabbits	Weight in kg.	Glucose gm./kg.	Blood-sugar level after glucose feeding in mg. %									
			Immediately before glucose	1 hr.	1 hr. 1/2	2 hrs.	3 hrs.	4 hrs.				
6	1.55	1.3	110	190	170	159	130	96	93			
8	1.55	1.3	88	204	207	185	140	96	90			
7	1.54	1.3	80	201	190	156	126	110	91			
Average			92	198	189	166	132	100	91			
Percentage rise from initial level				+115%	+105%	+80%	+43%					
5	1.7	1.0	108	138	130	123	107	91	101			
6	1.56	1.0	90	141	136	128	104	94	89			
Average			98	139	133	125	105	92	95			
Percentage rise from initial level				+42%	+36%	+27%						

TABLE B--(Contd.)

Sl. No. of Rabbits	Weight in kg.	Glucose gm./kg.	Blood-sugar level after glucose administration				
			Immediately before glucose blood sugar mg. %	15 mints. mg. %	1 hr. mg. %	2 hrs. mg. %	3 hrs. mg. %
6	1.55	1.0	80	196	108		103
10	1.53	1.5	101	Beyond assay range	185	94	89

TABLE C
Effect of tolbutamide on blood-sugar level of normal rabbits in mg.%
(C₁)

[illegible]

Dose : 100 mg/kg		(C ₃)	
16	1.57	100	75
17	1.48	100	82
18	1.57	100	70
			65
			74
			63
			70
			68
			60
			70
			85
Average		94	76
Percentage fall from initial level		-19	72
		-23	67
		-28	63
		-30	68
		-30	64
		-24	70
		-9	85
N			109

Dose : 50 mg/kg		(C ₄)									
10	1.43	50	112	76	67	78	92				
7	1.5	50	108	87	70	85	102				
		50	99	99	59	68	80				
1	1.66	50	98	86	61	79	92				
2	1.57	50	102	91	70	81	83				
18	1.48	50	100	86	76	70	81				
7	1.5	50									
Average			103	87	67	76	86				
Percentage fall from initial level				-15		-26	-14				

Dose : 25 mg/kg		(C ₅)			
18	1.4	25	92	83	73
17	1.39	25	100*	81	96
21	1.45	25	102	95	77 93
Average			98	86	77 87
Percentage fall from initial level			-12	-21	-11

Dose : 10 mg./kg.		(Ca)									
15	1.68	10	104	93	84	113	102	94			
2	1.56	10	103	102	100	100		94	92	94	88
Average			103	94	92	106	102	94	92	94	88
Percentage fall from initial level				-8.5	-10	+6		-8.5	-10	-8.5	+14

TABLE D
Effect of tolbutamide and glucose on blood sugar level of rabbits when fed together
(D₁)

(D₁)

Sl. No. of Rabbits	Weight in kg.	Tolbutamide mg/kg	Glucose gm/kg	Blood sugar level in mg. %											Remarks	
				0 hr.	1 hr.	1½ hr.	2 hrs.	2½ hrs.	3 hrs.	4 hrs.	5 hrs.	6 hrs.	7 hrs.	8 hrs.		9 hrs.
6	1.56	300	1.3	93	143	157	121	100	92	65	63					
10	1.43	300	1.3	92	145	161	133	111	96	67	76					
6	1.56	300	1.3	80	149	160	125	89	85	57	56					
Average				88	145	159	123	100	91	63	65					
Percentage from initial level					+65	+80	+40	+14	N	-30	-26					
4	1.49	50	1.3	87	✓	171	106			75	65					
Percentage from initial level					+97	+27				-15	-25					

Smaller dose of Tolbutamide

(D₂)

Tolbutamide given 3 hours after glucose feeding																
11	1.43	300	1.3	88	145	168	130	120		110	106	95	69			
20	1.75	300	1.3	100	135	155	150	148		112	80	82	70			
Average				94	140	161	140	132		111	93	88	69			
Percentage from initial level					+49	+71	+49	+42		+18	N	-6	-26			
8	1.47	50	1.3	80	145	105				101	80	80	80			
Percentage from initial level					+80	+31				+26	N	N	N			

Smaller dose of Tolbutamide

(D₃)

Glucose fed 3 hours after Tolbutamide																
13	1.3	300	1.3	85						77	112	80	68			
14	1.36	300	1.3	82						53	119	77	78			
Average				83						66	115	78	73			
Percentage from initial level					(Drug)					-20	+38	-6	-12			
6	1.35	300	1.3	97						67	132	72	56			
Percentage from initial level					(Drug)					-31	+36	-26	-42			
													76			
													-21			

TABLE E
Effect of insulin and tolbutamide on blood-sugar level of rabbits

Sl. No. of Rabbits	Weight in kg.	Insulin Unit/kg	Glucose mg/kg	Tolbutamide mg/kg	Blood sugar level in mg.											Remarks
					0	1	2	3	4	5	6	7	8	9	10	
(i) 2	1.5	1			81	43	50	60	82	93						Effect of Insulin alone
5	1.5	1			95	70	59	54	77	87						
Average					88	56	54	57	79	90						Effect of Insulin injection and glucose fed simultaneously
Percentage from initial level						-36	-39	-35	-10	N						
(ii) 1	1.56	1	1.3	together	86	116	82	80	93	90						Effect of Insulin injection, glucose and Tolbutamide (100 mg/kg fed simultaneously)
3	1.32	1	1.3	together	105	117	84	84	86	95						
Average					95	116	83	82	89	92						Effect of Insulin injection together with Tolbutamide (300 mg/kg) and glucose 1.3 gm/kg administered orally
Percentage from initial level						+22	-12	-13	-6	N						
(iii) 20	1.7	1	1.3	together	95	124	89	86	78	71						Effect of Insulin injection and glucose 1.3 gm/kg administered orally
21	1.2	1	1.3	together	103	146	91	80	71	62						
Average					99	135	90	83	74	66						Effect of Insulin injection and glucose 1.3 gm/kg administered orally
Percentage from initial level						+36	-9	-16	-25	-33						
(iv) 2	1.3	1	1.3	together	89	127	74	64	48							Effect of Insulin injection and glucose 1.3 gm/kg administered orally
3	1.44	1	1.3	together	85	119	74	42	44							
Average					87	123	74	53	46							Effect of Insulin injection and glucose 1.3 gm/kg administered orally
Percentage from initial level						+41	-15	-39	-47							
1	1.6	1	1.3	together	95	49	70	60	65	66						Effect of Insulin injection and glucose 1.3 gm/kg administered orally
Percentage from initial level						-48	-26	-37	-31	-31						

This observation shows that tolbutamide can exert its hypoglycæmic effect only after it has been allowed 2 to 3 hours for absorption and to reach an adequate concentration in blood before the carbohydrate diet is fed. Once it has reached the required concentration in the blood it will keep the blood-sugar level low for 3 to 6 and even 9 hours. Bander, Scholz and Hausler¹² reported that labelled (radioactive D 860) fed to dogs in doses of 100 mg/kg orally reached a peak concentration in blood (25 mg per cent) in 3 hours while in fasting dogs it reached in 15 hours, 90 per cent of the radioactive drug being excreted through the urine in 3 days. When tolbutamide is administered along with insulin it can prolong the hyperglycæmic effect. A dose of 100 mg/kg of tolbutamide along with 1.3 gm/kg of glucose orally and 1 unit of crystalline insulin injected subcutaneously simultaneously kept the blood-sugar at a lower level for 6 hours. When these two anti-diabetic drugs are given together with glucose a chain-like hypoglycæmic action is produced. Firstly insulin produces an immediate hypoglycæmic action which wears off in 2 to 3 hours by that time tolbutamide is absorbed and reaches a fair concentration in the blood to take over the hypoglycæmic action of insulin and therefore, the blood-sugar is kept low for another 4 to 5 hours after the insulin-effect has worn off.

Summary.—1. Tolbutamide when administered orally to normal healthy rabbits in doses of 200 to 300 mg/kg reduced the blood-sugar level to 30 to 40 mg% within 3 hours and this low level continued up to 8 hours.

2. With a dose of 100 mg/kg the maximum fall of blood-sugar was up to 35 mg% which lasted up to 3 to 4 hours. This effect of blood-sugar fall was almost similar in the case of prolonged starvation of animals though the blood-sugar fall continued up to 8 to 9 hours.

3. The minimum effective dose of tolbutamide was 25 mg/kg orally in rabbits.

4. As regards the effectiveness of tolbutamide on blood-sugar tolerance of rabbits. Tolbutamide could control and reduce the usual rise of blood-sugar only when the same was administered 2 to 3 hours prior to glucose feeding.

5. Insulin when administered simultaneously along with glucose and tolbutamide kept the blood-sugar level low for a longer period.

The authors wish to record their appreciation of the technical assistance rendered by Mr. R. N. Banerjee during their investigation.

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Cases and Comments

CONGENITAL HERNIATION OF THE LIVER

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CASE REPORT.—Mr. C., age 59: married; land-lord, came under observation on 21-9-'55 with the complaint of vague pain over the precordium of one week's duration unrelated to exertion.

Family history and history of previous illness revealed nothing particular. The patient is a vegetarian; does not smoke nor drink; but chews tobacco.

Present illness:—Patient was of active habits and was quite well till a week ago, when he experienced a vague pain over the precordium, dull and bearable in nature and unrelated to exercise and not radiating in any direction; pressure gave him relief; his sleep was not disturbed; his appetite was good and bowels regular.

Physical examination:—He was a well-nourished individual, about 59 years of age, not anæmic, not jaundiced, no cyanosis, no clubbing of fingers, no cough present; skin healthy; there was no oedema of the extremities. The temperature was 98.6° F; no palpable glands were felt anywhere in the body except the inguinal ones; the pulse rate was 80 per minute; pupils equal on both sides and reacted to light and accommodation.

The respiratory and cardiovascular systems did not reveal any abnormalities.

Abdomen:—The liver and spleen were not palpable and no abnormal masses were felt in the abdomen; hernial orifices were intact.

Investigations.—1. **Urine:**—Sp. gravity 1016; acidic in reaction, no albumin, no sugar, no bile salts or bile pigments and no deposits.

2. **Blood:**—Total W.B.C. 8000 per c.mm. D.C.: polymorphs 66%; lymphocytes-30%; monocytes-2%; and eosinophils-2%; Haemoglobin-80%. The blood-pressure reading was 124/76 mm. of mercury.

3. **Motion** showed no ova or cysts.

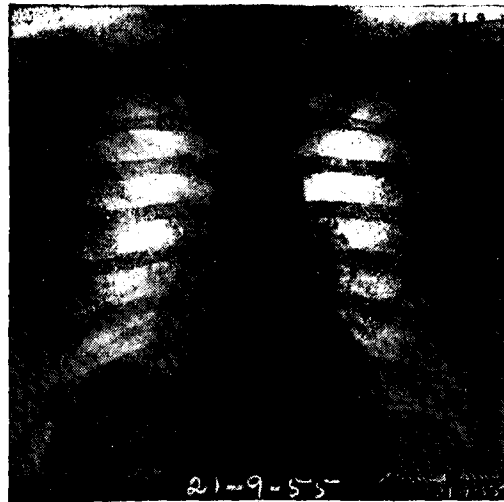
4. **X-ray of chest for lungs and heart—21-9-55 (see p. 50):**—There was a convex rounded shadow rising from the antero-medial portion of the right diaphragm; the lung-fields were within normal limits; the heart borders were not enlarged.

On fluoroscopy, the right dome of the diaphragm was found to bulge upward in its medial and anterior portion. The highest point of the protruding shadow extended to four-finger breadth

above the left diaphragm. The outlines of the bulge were smooth and rose rather steeply, medially and anteriorly, while laterally and posteriorly, they sloped more gradually down into the peripheral portions of the diaphragm. The shadow showed paradoxical motion on respiration.

Screening of the œsophagus during barium swallow did not reveal any abnormality.

X-ray pictures taken on 10-4-'57 (see p. 51) for follow-up of the case were more or less mirror-images of the one taken on 21-9-'55. (*supra*).



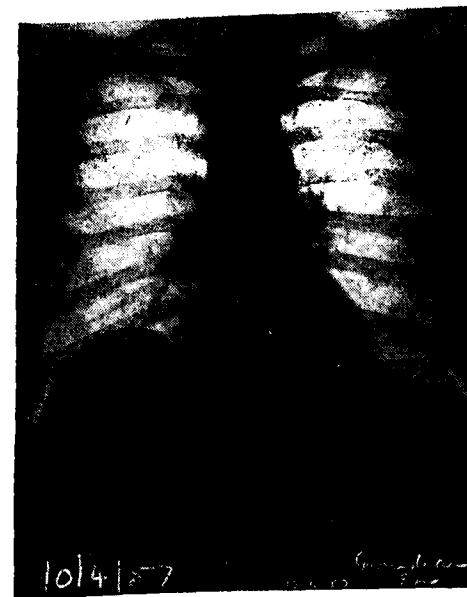
21-9-'55. X-ray chest for lung-fields and heart. P.A. and right lateral views, show a convex, rounded shadow rising from the antero-medial portion of the right diaphragm. The convex segment moved paradoxically on inspiration.

DIFFERENTIAL DIAGNOSIS:—1. *Anomalies of the gastro-intestinal tract*, producing shadows in the right cardiophrenic angle which either contain gas or can be filled with barium (stomach, or intestines herniated through the right foramen of Morgagni; large hiatus hernias or epiphrenic œsophageal diverticula). These were very easily excluded.

2. *Omentum herniated through the right foramen of Morgagni:*—Closely resembles the picture of herniated liver on simple X-ray examination but can be distinguished from it by the associated upward displacement of the colon and the stomach.

3. *Hepatitis and liver abscess:*—Among the commoner conditions we have to think of the amœbiasis of the liver. Amœbiasis is very common in India due to *E. histolytica*, especially in the delta areas. The incidence of amœbiasis, as given by different authors varies widely from 8 to 15 per cent of the total

population. Only in a small number of these cases do *E. histolytica* lying either at the base of amœbic ulcers specially of the cæcum and ascending colon or embedded in the submucosa without any obvious superficial ulceration of the mucosa, invade the small tributaries of the portal vein in the submucous coat and are carried as emboli to the liver. Apart from the embolic infection, the liver may in some cases be infected through the peritoneal cavity. On reaching the liver, most of the *E. histolytica* undergo degeneration or are destroyed by tissue reactions. Others multiply and cause cytolysis of the hepatic tissues and give rise to small scattered greyish areas of necrosis (micro-abscesses) surrounded by a zone of hyperæmia. These are the usual changes found in amœbic hepatitis.



10-4-'57. X-ray chest for lungs and heart. P. A. and right lateral views are identical with the pictures taken on 21-9-'55.



Later on, the necrotic areas, described above, liquefy at the centre gradually spread by further cytolysis and coalesce with neighbouring new necrotic foci by the destruction of the intervening septa to form a big ragged abscess cavity, around which occurs a marked proliferation of the connective tissue cells forming a dense fibrous wall. The contents of this cavity, in the absence of any secondary bacterial infection are usually not purulent but chocolate-coloured and mixed with small blood clots streaked with yellowish mucoid material, due to the presence of blood, necrosed liver cells and cytolysed tissues. In case a secondary infection occurs, the contents are purulent and show a large number of bacteria e.g., hæmolytic streptococci, staphylococci or

B. coli. The amœbæ which are absent in the contents of the abscess, are present in the pus and the necrosed tissues from the walls of the cavity; it is however, difficult to demonstrate their presence in the former.

Liver abscesses are usually single in 70 per cent of cases or occasionally multiple; when single, the abscess is usually situated in the right lobe of the liver near the dome of the diaphragm or on the under-surface near the hepatic flexure. The liver shows varying degrees of enlargement with fatty changes.

One thing to remember in this connection, is the frequency of amœbic infection of the bowel and its hepatic complication is greater than is commonly realized. It is stated in the literature that amœbic infection of the liver may develop at any age but is more frequently observed during adult life with the highest incidence in the third, fourth and fifth decades; the disease seems to occur rarely at the two extremes of life, although cases have been met with in infants as well as in old persons. It is believed to be significantly high in men because of alcoholism. Women are not absolutely exempt from this infection, although they are not usually given to alcohol.

The incidence of hepatic involvement in amœbiasis varies considerably since it depends upon a number of factors, depending particularly upon the incidence and relative control of the primary intestinal infection and the character of the population from whom the statistics have been gathered. If intestinal amœbiasis is recognized and treated early the incidence of hepatic involvement will certainly decline. The two most significant factors in the development of amœbiasis of the liver (amœbic hepatitis and hepatic abscess) are perhaps:—(1) the production by the amœbæ of intrahepatic portal thrombosis and infarction and (2) the cytolytic activity of the amœbæ. The amœbæ which are carried to the liver from the bowel by the portal circulation are filtered out into the portal capillaries and if they lodge in these smaller portal radicles in sufficient number they may produce thrombosis with typical infarction and subsequent focal necrosis, thus paving the way for the cytolytic activity of the amœbæ, permitting lysis and destruction of the involved liver parenchyma and the early stages of abscess formation. Further evidence of this mode of development of amœbic hepatic infection is provided by histologic studies of sections of the liver showing various stages of the disease. "In the earliest stage of the process there is observed a peripheral zone of hyperæmia surrounding an area composed of cytolysed tissue cells in which may be seen red blood corpuscles, degenerated liver cells, a few leucocytes, connective tissue cells and granular debris with, now and then, a trophozoite of *E. histolytica* lying in a zone of completely cytolysed material". This early process of amœbic hepatitis may

not progress farther but heal by connective tissue replacement as shown by focal scar-tissue, residues of healed small amœbic abscesses in other sections of the liver. It is thus apparent that in the early phase of amœbic hepatitis, a balance exists between progression toward suppuration or true abscess formation and regression toward healing and this balance may be upset by several factors like the virulence and numerical strength of the infective organisms, the relative resistance of the host, the presence possibly of alcohol, trauma or other unfavourable conditions.

Regarding clinical manifestations, the emphasis laid on the fallacious impression that diarrhœa whether as an antecedent or accompanying manifestation occurs with significant frequency in amœbic hepatitis or hepatic abscess must be dispelled. Actually a relatively high proportion of patients do not give a history of diarrhœa and for this reason too much reliance should not be placed upon its presence or absence.

It is well to stress that amœbiasis is common and its two forms, hepatitis and liver abscess are clinically and roentgenologically recognizable and this recognition of hepatitis in its early stages in obscure cases by means of X-rays is helpful in preventing "liver abscess", because 'chloroquine' has now been found effective in amœbic hepatitis.

Amœbic hepatitis manifests itself clinically in three forms: acute, subacute and chronic. Of the many laboratory findings, the total leucocyte count is found to be of greater value in abscess than in hepatitis. Roentgenography is a particularly useful procedure in amœbic infections. It may give the clinician the first clue to the diagnosis and confirm the clinical manifestations. The X-ray appearance varies considerably with the stage of the disease, the location of the amœbic process and the extent and degree of hepatic and thoracic involvement. The various stages of amœbic processes in the liver may be followed by X-rays.

During the stage of hepatitis: (1) the roentgen findings are limited to the general enlargement of the liver shadow; (2) the elevation of the right diaphragm with restriction of its mobility (occasionally with paradox movement or its complete immobilization); (3) the contour of the right diaphragm becomes hazy and indistinct the diaphragm flattens and the costophrenic sinus becomes clouded and (4) because, involvement of the liver occurs most frequently near the dome and in close contact with the diaphragm, varying degrees of pulmonary and pleural reaction may be observed in the right basal area.

In addition to the above findings, there may be observed in true abscess formation, a distinct bulging of the diaphragm pointing upward into the lower pulmonary field. When a solitary

abscess is formed, the roentgen findings become more localized and definite. They may be found however, only when the abscess is situated at the hepatic periphery especially near the diaphragm. This distinct localized upward bulging of the diaphragm into the right lower lung field may then be seen in the postero-anterior and lateral X-ray pictures. This bulging is accompanied by an elevation of the right diaphragm and an impairment of its mobility.

An abscess in the right lateral zone of the liver causes bulging of the lower portion of the chest and widening of the intercostal spaces. An abscess in the central or lower portion of the liver may be recognized only if it is very large, partly calcified or if the contrast-medium-filled gall bladder is displaced downward and laterally. If air is introduced into the abscess cavity, a fluid level will be seen in the liver shadow in the erect position and a round radiolucent area will be seen in the prone position.

Reduced mobility of the diaphragm may also be caused by acute liver or gall bladder inflammation such as cholecystitis, empyema of the gall bladder but in such conditions there is no marked elevation of the diaphragm unless a concurrent subphrenic process is present.

Roentgenography is also of value in differentiating amoebic infections of the liver and subphrenic space from those due to other causes. Most pyogenic infections of the subphrenic space result from an infection in the appendix and are located in the right postero-superior space. Amoebic infections on the other hand are located generally in the right lobe of the liver and near the dome somewhat more anteriorly than posteriorly. Accordingly, the X-ray picture shows in the antero-posterior view, a characteristic elevation of the medial portion of the right leaf of the diaphragm with obliteration of the cardio-phrenic angle. In the lateral view, the elevation is primarily anterior with a tendency toward obliteration of the anterior costo-phrenic angle. In pyogenic subphrenic infections, on the other hand, there is an elevation particularly of the lateral portion of the diaphragm in the antero-posterior X-ray picture and obliteration of the costo-phrenic angle with a tendency toward obliteration of the posterior costo-phrenic angle in the lateral view picture.

The value of roentgenography has been repeatedly demonstrated by many observers in hepatic amoebiasis. Positive findings are much more common in cases of abscess than in hepatitis.

4. The diagnosis of other conditions such as *mediastinal or pericardial tumours or cysts* especially hydatid cysts may be more difficult to establish by simple X-ray examination and

may require, special techniques including tomography and pneumoperitoneum for a final conclusion.

5. *Malignant tumours of the liver*:—Are not likely to protrude into the chest unless they develop in a pre-existing herniated portion of liver tissue. The same holds true for hydatid cysts.

In the case under report, the X-ray findings are important. In the more common type of partial eventration as in this case, which involves the antero-median part of the right diaphragm, the radiologic findings are essentially the following:—

On fluoroscopy, a semicircular, homogeneous, non-pulsating shadow of soft tissue density is seen in the right lung field, arising from the median portion of the diaphragm with a broad base. It is situated close to the right cardiac border and fills the cardio-phrenic angle. It becomes more prominent on deep inspiration when the lateral and dorsal portions of the diaphragm move downward while the convex segment moves upward. The mass is of grapefruit size and its lateral border is sloping and dips into the diaphragm at an angle.

In the right lateral view, the mass appears close to the anterior chest wall. From here the contour curves slightly upward and continues in a gentle slope posteriorly, merging gradually into the posterior portion of the diaphragm. Radiographic studies demonstrate the location of the mass, its homogeneous nature, the sharp convex outline and its continuity with the liver shadow.

A combination of the findings enumerated above is virtually diagnostic of partial eventration of the right diaphragm with herniation of the liver into the diaphragmatic pouch. Further confirmation, if required, may be obtained by an artificial pneumoperitoneum.

Intraperitoneal insufflation of 500 to 1000 cc. of air produces a separation of the diaphragm from the liver by a translucent zone of gas. The diaphragm stands out thick, with a clearly defined, thinner, semicircular pouch projecting upward from its right antero-median. The silhouette of the convex surface of the right lobe of the liver reveals a conspicuous protuberance which is dome-shaped, homogeneous, sharply circumscribed and smoothly outlined. This picture is significant and establishes the diagnosis beyond doubt.

Artificial pneumoperitoneum must not however, be considered a routine diagnostic procedure for this condition, since simple fluoroscopic and radiographic examinations will permit a reasonably definite diagnosis in most cases and a follow-up of these cases with simple conventional skiagrams at periodic intervals, on more than one occasion would clinch the diagnosis.

Even if artificial pneumoperitoneum is done for confirmation it is impossible in certain cases even if uncomplicated to separate the liver completely from the diaphragmatic sac by air-insufflation. This is easily explained when the portion of the liver which is attached to the falciform ligament is drawn into the pouch; this bare-area of the liver surface is extraperitoneal and therefore, cannot be detached from the inferior surface of the diaphragm by intraperitoneal air.

In our present case, the patient was not willing to undergo this procedure and so a follow-up aided by a repetition of the skiagrams established the diagnosis beyond doubt.

Pathology and pathogenesis.—In surgical autopsy reports of these cases, the affected portion of the diaphragm is described as "a thin and translucent, fibrous membranous or aponeurotic pouch, grossly free of muscle fibres and bulging into the thoracic cavity. It consists essentially of fused diaphragmatic pleura and peritoneum. The opening of the pouch is horse-shoe-shaped or crescentic and bound by a band of diaphragmatic muscle. The diaphragm is unaffected."

Microscopically, the wall of the sac reveals the two intact serosal layers with scant intervening connective tissue and a few scattered muscle fibres. There is no actual gap in the diaphragm.

The diaphragmatic sac is fully occupied by an accessory lobe of the liver which forms a hump on its upper surface, and consists of parenchyma identical with that of the rest of the organ. The base of this protuberance fits snugly into the ring-like opening of the diaphragmatic pouch. It is often broad and pedicle-like and constricted by the muscular ring formed by the surrounding normal diaphragm.

More or less similar findings were reported in newborn infants also. Identical findings in the newborn and adults suggest that the lesion is congenital and the basic pathologic disturbance is aplasia or hypoplasia of part of the musculature of the right diaphragm usually in the antero-medial, less often in the central portion, the stretching and bulging of the affected portion being due to its inability to resist the physiologic intra-abdominal pressure; the underlying portion of the liver prolapses into the diaphragmatic pouch as it develops and by moulding itself with the abnormal space, forms an accessory lobe which is intra-thoracic but remains sub-diaphragmatic; presumably, this development occurs during the intra-uterine period although the eventration conceivably may increase during post-natal life.

The presence of the lesion at birth and in infancy and the constancy of its location characterize it as a developmental anomaly. The clue to the origin of the more common antero-medial type of partial eventration is probably to be found in

the peculiarities of the early phase of the embryonic development of the diaphragm.

The partition of the continuous coelom of the foetus into a thoracic and an abdominal cavity beginning with the formation of the "septum transversum" a ventral shelf of mesodermal tissue. By the eighth week of foetal life the process of partition is completed by the development of paired pleuro-peritoneal folds which become the dorso-lateral parts of the future diaphragm and their fusion with the primitive mesentery centrally and the septum transversum anteriorly. The muscular component between the pleural and the peritoneal membrane develops later and independently. The comparison of a diagram of the primitive embryonic diaphragm and of a fully developed one, shows that the septum transversum represents the substrate for an approximately triangular ventral portion of the fully developed diaphragm comprising the area occupied by the diaphragmatic pericardium and a smaller adjacent area to the right of it, the latter, bordered by the heart and the anterior chest wall is the most common site of partial eventration of the diaphragm. (*vide* Fig. 1.)

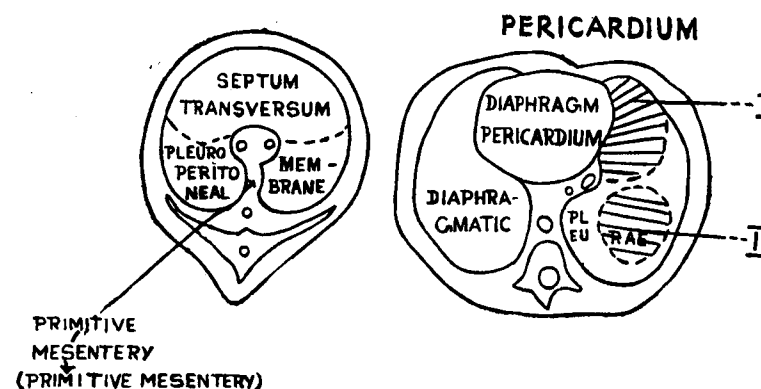


Fig. 1

Foetal and adult diaphragms indicating the relationship between the area of the embryonic septum transversum and the more common (antero-medial site of partial diaphragmatic eventration). It shows the site of central type of eventration.

The maldevelopment responsible for this anomaly could conceivably be either: (a) failure of the right pleuro-peritoneal folds to fuse solidly with the septum transversum; or (b) a failure of muscular tissue to develop in the septum transversum. The former non-fusion, theory appears unlikely because no actual defect is found in the pleural or peritoneal membranes; the latter possibility, (muscular aplasia of the two) appears the more plausible since the absence of *muscle* fibres in the diaphragmatic pouch has been established in the newborn as well as in the adult. The absence of such a muscular layer is apparently of no consequence in that part of the original septum transversum

which is buttressed by the overlying heart. The remaining unsupported segment to the right of the heart is however, obviously unable to withstand the intra-abdominal pressure, becomes stretched, bulges into the chest and forms the hernial sac which, as it expands, is occupied by the adjacent portion of the liver. This concept of the development of the antero-median type of partial eventration of the right diaphragm is offered as a hypothesis which fits in with the established facts and may represent a plausible explanation for the development of the anomaly.

TREATMENT:—No active treatment is necessary for a condition discovered accidentally during routine radiological examination of the chest and particularly so, when it does not cause any symptoms or signs referable to it.

Summary.—1. A case of congenital herniation of the liver is reported.

2. Amœbiasis of the liver (amœbic hepatitis and amœbic abscess of liver) is discussed in detail, since it is very common as compared with congenital herniation of the liver.

3. (i) Congenital herniation of the liver is remarkable for its virtually exclusive occurrence on the right side and its predilection for the antero-median portion of this hemi-diaphragm. (ii) Its radiologic picture is sufficiently characteristic to allow a correct diagnosis to be made with reasonable certainty from the appearance alone. (iii) It has been found in infants, children and as well as in adults.

This condition may present a puzzling problem to those unfamiliar with the entity and has often led to unnecessary anxiety and even needless surgical exploration.

It has often led to many diagnostic errors, as it can be confused either with a variety of tumours or cysts, intrathoracic (pulmonary, pleural, pericardial or mediastinal) diaphragmatic or subphrenic (especially hepatic) or with loculated pleural or pericardial effusions.

Only three cases are on record in which the herniated pleura of the liver became strangulated and gave rise to symptoms of intermittent incarceration.

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ANTIBACTERIAL PROPHYLAXIS

The existing evidence indicates that the prophylactic use of antibacterial agents is of value under the following conditions:

- (1) In contaminated wounds of violence, including burns.
- (2) In elective surgical procedures performed through, or in contaminated areas such as the gastrointestinal, respiratory, or genito-urinary tracts.
- (3) In patients with associated derangements of the urinary tract who undergo surgical operations.
- (4) In patients with indwelling catheters.
- (5) In persons with pre-existing valvular heart disease who sustain injuries or undergo operations of the oral or pharyngeal cavities.
- (6) In patients undergoing emergency surgery in the presence of associated but unrelated infections such as acute tonsillitis.
- (7) For preparation of the gastrointestinal tract.
- (8) For elderly people with chronic pulmonary disease who undergo surgical treatment.—(*Archives of Surgery*, July '55 via *Curr. Med. Dig.*, Feb. '57).

MILIARY PERITONEAL CARCINOMATOSIS

Simulating Miliary Tuberculosis

(With reports of 2 cases)

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Introduction.—Though peritoneal implantation of carcinoma is common, miliary spread with a clear straw-coloured fluid is less common. Such spread is difficult of diagnosis clinically, and at laparotomy may simulate miliary tuberculosis. The following cases are cited as illustrations.

CASE 1:—R.D., a woman of 62 years was admitted in the hospital on 24-6-'55 at 9-45 p.m. with the following complaints:—Abdominal pain; vomiting; absolute constipation; and slight fever, all of two days' duration.

History of the present illness:—The pain was insidious in its onset and was first felt in the region of the umbilicus, and then gradually spread all over the abdomen. It was of a dull aching character, and was associated with vomiting and absolute constipation. The abdomen, particularly the lower part, gradually became distended.

Past history, personal and family histories were not significant.

On examination:—The general condition was low; dehydration was present; the tongue was dry and coated. Anæmia was present but there was no jaundice. Oedema of legs was present and there was no abnormality seen in the heart. Lungs showed the presence of moist sounds at the bases. The abdomen showed marked distention particularly in the lower abdomen, and also tenderness; there was no rigidity, nor was any lump felt. It was tympanitic on percussion with dullness in the flanks. Shifting dullness and liver dullness were present; and peristaltic sounds were audible. P.R.—no positive finding.

A provisional diagnosis of carcinoma of the sigmoid colon with intestinal obstruction and ascites, was made because of her age.

Treatment was started with Fowler's position, continuous gastric suction, I.V. drip, transfusion and injection of penicillin and streptomycin. A compound enema produced no result.

She was operated next morning under gas and oxygen anaesthesia. The abdomen was opened by right paramedian incision. Distended transverse colon and some coils of the small intestine came out. The abdomen contained clear straw-coloured fluid. There were plenty of "tubercles" in the mesentery, transverse meso-colon and in the greater omentum, simulating miliary tuberculosis. There were little adhesions between coils

of the gut. No growth was felt in the entire gastro-intestinal tract, liver or pancreas, nor any definite cause of obstruction found. From the operative findings it was diagnosed as miliary tuberculosis. The "tubercles" were slightly bigger than true

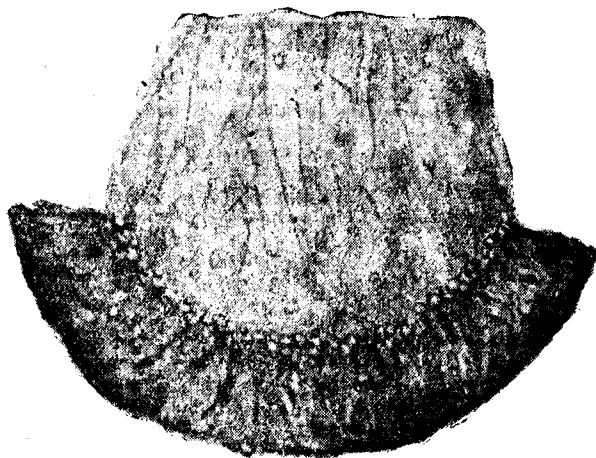


FIG. 1. Shows miliary carcinomatous deposits simulating miliary tuberculosis. The deposits are mostly aggregated at the attachment of the mesentery to the small intestine.

tubercles and were arranged parallel to the gut at its junction with the mesentery (Fig. 1). A piece of omentum containing "tubercles" was removed for biopsy. The colon was deflated and the abdomen was closed. Post-operative treatment was on the usual lines with continuous suction, blood, plasma and glucose transfusion, antibiotics, oxygen inhalation and Vitamin B₁ injection.

The distention persisted inspite of fair result with the enema given on alternate days. There was no improvement in the general condition. About 3 weeks after the operation, the general condition became low and the dressing was wet with a foul fishy smelling discharge. Removal of the dressing showed burst abdomen with adhesion of the intestines to the abdominal wall and among themselves. The burst abdomen was closed by sutures through the skin and subcutaneous tissue only.

The distention still persisted inspite of fair result after regular enemas. The general condition did not improve with treatment. She expired 7 weeks after the operation on 17-8-'55.

The biopsy report suggested adenocarcinoma; no primary was detected during the operation. The pathologist suggested it may be from the ovary which was not thought of during the operation and unfortunately not specially looked for.

CASE II:—A.M., male, aged 26 years, was admitted in the hospital on 11-10-'55 at 6-45 p.m. with abdominal pain and distention for 10 days and constipation for 7 days.

History of the present illness:—The onset was insidious. The pain started round the umbilicus which was griping in nature, and gradually became severe and was sometimes colicky. The abdomen became gradually distended. Bowels did not move for

the last 7 days and there was absolute constipation for the last 2 days. There was no vomiting.

Past history:—There was a history of the occasional passage of mucus and blood with the stools for the last 3 months and also a previous history of dysentery.

On examination:—The patient looked ill with a coated tongue; anæmia was present; P/R was 86/20; the heart showed no abnormality; and the lungs showed crepitations on both sides.

The abdomen was tensely distended, with no visible peristalsis; nor was any mass felt. Shifting dullness was well marked; the central abdomen was tympanitic and liver dullness was present in the mid-axillary line. There were exaggerated peristaltic sounds.

A clinical diagnosis of tuberculous peritonitis (combined adhesive and ascitic type) was made.

Treatment was started with Fowler's position, continuous gastric suction, glucose-saline transfusion, penicillin and streptomycin injections hourly, P/R charting and a compound enema which was not retained.

A digital examination of the rectum revealed a hard mass in the anterior wall of the rectum with a smooth surface. The lumen of the rectum was almost blocked. There was no ulceration of the mucous membrane in the palpable part of the mass as suggested by the absence of blood on the gloved finger. Flatus tube could not be passed.

A diagnosis of carcinoma of the rectum with intestinal obstruction and ascites was now made although the absence of any ulcerated surface was not accounted for.

Operation was done under general anæsthesia. The abdomen was opened by a low right paramedian incision. The peritoneal cavity contained a moderate quantity of straw-coloured fluid. Both the small and large guts were distended and their serous surface with the mesentery were studded with 'tubercles'. There were a few adhesions between the coils of the intestines. The hard mass in the rectum was palpated with the apparently intact serous coat. The liver was normal.

From the above findings, a diagnosis of miliary tuberculosis with a hyperplastic tuberculous mass in the upper rectum was made.

(I had previous experience of a case of hyperplastic tuberculosis in the recto-sigmoid junction).

A loop colostomy of the sigmoid colon was done through a separate oblique incision in the left iliac fossa. One of the appendices epiploicæ containing some "tubercles" was removed for biopsy. The abdomen was closed in layers with tension sutures.

Post-operatively, the patient had continuous gastric suction, transfusion of blood, Plasmosan and glucose-saline, intramuscular terramycin and streptomycin injections, and stimulants.

His general condition improved slightly and the distention became less. Enema was given through the colostomy opening, with fair result. From the 5th day after operation, his general condition again became unsatisfactory with increased abdominal distention and low urinary output for which he had intravenous isotonic Sodi sulph solution followed by plasma and glucose-saline transfusion, gastric suction and an enema and glucose-colostomy opening. There was no improvement and he died on the 8th day.

Biopsy of the tissue showed a picture of adenocarcinoma with mucoid change.

Discussion.—Peritoneal implantation of carcinoma is common from carcinomas of the gastro-intestinal tract, liver, gall-bladder, pancreas and ovary. The cancer cells escape into the peritoneum after bursting through the serous coat. Ewing (1940) states "The most frequent source of these peritoneal growths is the ovarian adenocarcinoma which at any period may rupture its covering and be disseminated through the cavity. Its cells readily become implanted on the peritoneum, producing many to ascites." Implantation from extra-abdominal sources, like the breast, is also common. The peritoneal implantations are often in the form of hard discrete nodules or a hard mass of conglomerated nodules, or both, which are often clinically palpable. The peritoneal implantation is often accompanied by hæmorrhagic ascites detected at laparotomy.

Misumi (1909) was the first to study the genesis and growth of peritoneal implants. These were subsequently confirmed and elaborated by Sampson (1931). Cancer cells deposited on a healthy area of the peritoneum cause toxic damage to the lining endothelium and stimulate an inflammatory reaction in the sub-serous tissues. This results in the exudation of coagulable lymph on the damaged area which forms a patch of fibrin in which the tumour cells are embedded. Organization of the fibrin takes place and proliferating blood vessels and fibroblasts from the sub-serous tissues extend into it. A true stroma is thus formed for the embedded tumour cells. These multiply and infiltrate the subjacent tissues forming a metastatic nodule.

The life history of peritoneal carcinomatous implants may therefore, be divided into three main stages (Sampson, 1931):—(1) The escape of cancer cells into the peritoneal cavity; (2) the transportation of these cells to their site of implantation; and (3) the reaction of the peritoneum injured by the cancer cells

lodging on its surface:—(a) Fixation of the cancer cells by fibrin; (b) organization of the fibrin; and (c) the organized implant and its subsequent behaviour.

The cells which escape into the peritoneal cavity often continue to multiply in the ascitic fluid like bacteria in a fluid culture medium. The ascitic fluid produced from the peritoneal irritation by escaping cancer cells is the most important factor in the transportation of these cells. The amount of fluid, gravity and the posture of the patient determine the situation of the fluid and the presence of its cellular contents. When the fluid is small in amount, most of it remains in the pelvic cavity. When the amount is large it reaches all parts of the abdominal cavity including the diaphragm in the recumbent posture. Therefore, the amount of fluid determines, in large measure, the distribution of the metastases.

Only occasionally do the cancer cells of an implant die. As a rule the implant grows though its cells may lie dormant for a long time. As a general rule, the peritoneal implant has the same potentialities of invasion and dissemination as a primary tumour. It may, therefore, give rise to secondary implants on the peritoneum.

Peritoneal implants are sometimes scattered widely and indiscriminately in the peritoneal cavity, but more commonly they show preference for certain situations:—

1. They are most common in the pelvic peritoneum, in the recto-vesical or recto-uterine pouch or on the pelvic organs. According to Rosenstrin (1910) the deposits occur first in the deepest part of the pouch. This deposit is due to the influence of gravity, as in the erect and semi-recumbent postures, pelvis is the most dependent part of the abdominal cavity.

2. The implants are also frequently deposited at the attachment of the mesentery to the small intestine, where they form a close line of nodules along a large part or whole of the bowel (see *Fig. 1*, p. 60). This distribution is probably due to the easy lodgment of tumour cells in the peritoneal crevices, where the mesenteric vessels enter the bowel wall.

3. Omentum and appendices epiploicae are also common sites of implant carcinomatosis. In the omentum, secondary growths by lymphatic extension also play some part.

4. Rarely, the process may involve hernial sacs.

These peritoneal nodules are usually much bigger than tubercles. Rarely they are small, nearing the size of tubercles. In the absence of a detectable frank primary growth in the abdomen or any hæmorrhagic effusion, the latter form when in plenty simulates miliary tuberculosis.

Hæmorrhagic ascites frequently accompanies peritoneal implantation. This is probably the result of vascular obstruction

in the sub-serous tissues; cancerous permeation of sub-serous lymphatics and occlusion or compression or damage of venules occur. There may be serous effusion before the venules are involved. Ascites may partly be due to an inflammatory exudate from the irritative effect of the toxic products of tumour cells.

Adhesions frequently result from peritoneal carcinoma due to the organization of the fibrinous exudate (resembling tuberculous adhesion) or to a direct tumour infiltration from tissue to tissue or confluence of opposed peritoneal implants. In some cases, adhesions are absent, inspite of widespread peritoneal carcinomatosis; the latter is probably due to pressure of abundant fluid effusion with constant movements of some viscera.

Tumour implants on the gut or its mesentery may cause impaired activity of the gut leading to intestinal paresis and obstruction. Miliary tuberculosis also behaves in the same way to produce intestinal symptoms.

Summary.—(1) Two cases of miliary peritoneal carcinomatosis are reported which, at operation, simulated miliary tuberculosis. (2) The mode of formation of peritoneal implants and their size and sites of preference are discussed. (3) The causes and nature of effusion and adhesion in such cases are discussed. (4) The correct diagnosis was established by biopsy in both the cases.

Acknowledgement.—My grateful thanks are due to Dr. M. N. Sarkar, Principal and Superintendent, Medical College and Hospitals, Calcutta, for according permission to me to publish the case reports.

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TOXIC URETHRITIS

In this paper from Groote Schuur Hospital, Cape Town, the author expresses the view that the non-specific urethritis is not a venereal disease, and that to associate the condition with sexual intercourse is both "misleading and retrogressive." Non-gonococcal urethritis, he considers, is almost always non-venereal in origin, the causative organisms and toxins being carried by the blood stream from distant foci of infection—for example, the upper respiratory tract and the bowel, to the prostate, seminal vesicles, and the glands of Cowper, whence infected secretions periodically invade the urethra.

Treatment, which may have to be supplemented by irrigation and urethral dilatations, consists in massaging the glands of Cowper or the prostate, antibiotics being given only when there is evidence of blood-stream infection or when massage is thought to have aggravated the patient's symptoms. The author considers that the demonstration of the presence of a toxin would be a greater advance in the study of the aetiology of non-specific urethritis than the identification of a putative specific organism.—(Purcell, F.W.F. (1956). *S. Afr. J. Lab. Clin. Med.* 2, 168 via *Brit. Jour. of Venereology*).

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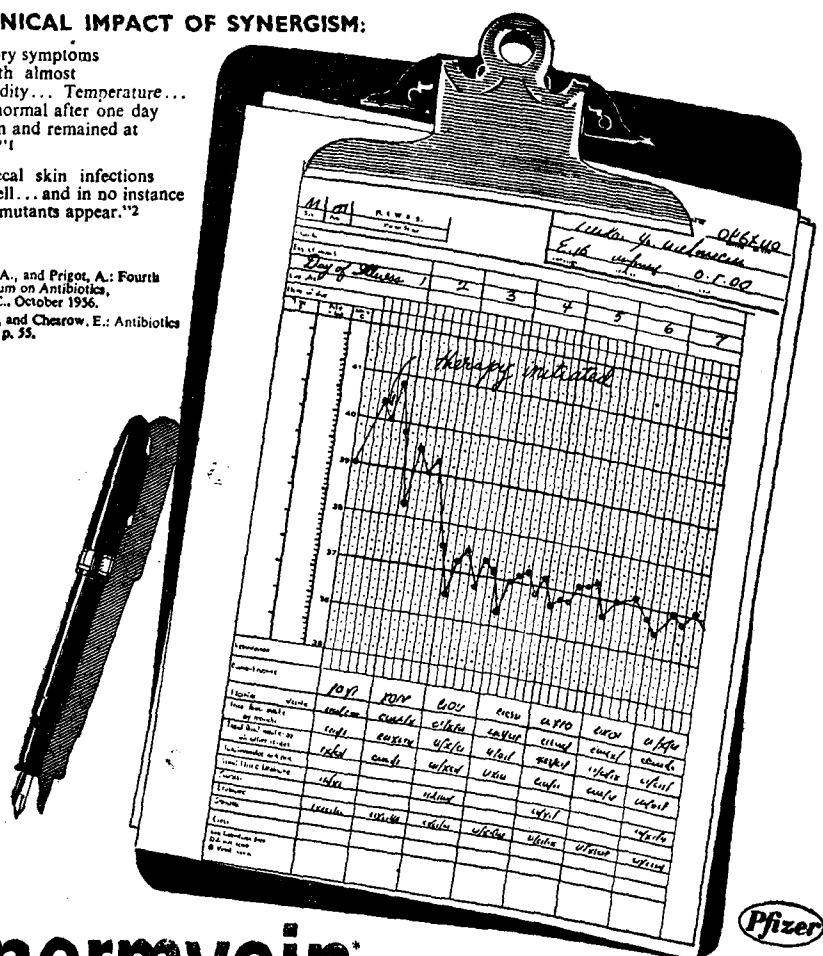
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Editorials

EVENTFUL FIFTY-SEVEN (1957)

ANOTHER year has passed by, during which have occurred very momentous world events in all spheres of human activity. With the advent of tremendous developments in science, there has been a tendency among the western nations to forget the old approaches in international affairs. We have not seen the end of the cold-war-freeze in respect of disarmament though we expected and hoped to have an atmosphere congenial to the universal acceptance of "Panch Shila" by the end of the year. "If disarmament does not come soon, the dangers threatening the world will be infinitely greater", as Prime Minister NEHRU told the Commonwealth Conference on the 10th of December last; "because of the nuclear weapons which are bound, in 10 or 15 years to be in the hands of many more countries, thereby making disarmament practically impossible." He rightly stressed that if Panch Shila, the five principles of peaceful co-existence, should be honestly adopted by all countries, it would banish or at all events, considerably minimize the tensions, fears and apprehensions, which threaten peace in the world.

This year's session of the NATO Conference which met in Paris under the presidency of President DWIGHT EISENHOWER and was attended by the Premiers of 15-member nations was indeed a high-power meeting, at which military and political matters of great international importance were discussed. The decision to dramatize the NATO talks this year and give them special importance is perhaps due to the evidence of the growing Russian power demonstrated to the whole world by their Earth Satellites (Sputniks). The Soviet leaders have made it clear that highly destructive modern weapons and missiles are being introduced into their armed forces. The attitude of Dr. ADENAUER,

the German Chancellor, at this Conference has given us hope that fresh negotiations will be launched between East and West Europe during the coming year. Another important decision of the Paris Conference was the move to integrate scientific research and pool technical information. If the Soviet Union refuses to participate in the work of the United Nations Disarmament Sub-Committee, we are told that a meeting at the Foreign Ministers' level will be welcomed for resolving the dead-lock.

It will be clear, even from the very brief summary of important world events recorded above, that peaceful and ordered progress in the direction of human welfare, particularly in the under-developed countries of the world, will receive a set-back, unless the deadlock is soon resolved. Our Prime Minister has been busy all the time negotiating with the Western Powers to bring about a complete stoppage of all nuclear tests and of the manufacture of atomic weapons, but so far without the desired end-result, though signs are not wanting that NEHRUJI's appeal has been well received in responsible circles.

In India, the second general elections based on universal adult franchise were held and the Congress party came into power again in all the States except Kerala where Communists were returned in a majority. The Second Five-Year Plan has had to be curtailed and amended owing to financial stringencies and the difficulty in raising the necessary funds from the world market. Though the Public Health Programme under this plan would necessarily share in the set-back, many of the urgent and important schemes are being put through, and we hope the more urgent among the principal objectives of the plan, will be implemented during the period. The control of communicable diseases like Malaria, Leprosy, Tuberculosis, Filariasis and Yaws, has progressed apace during the year, thanks to the aid from WHO and other international organizations, in the shape of men and money. The E.S.I. Scheme has been extended to include the families of the employees, and we believe that any kinks met with in the proper working of this scheme will ultimately be straightened out. The N.E.S. and Community Projects have been greatly expanded to cover many more centres and they are rendering very great help in bettering the living conditions of the rural population.

The outstanding events of the year which highlighted the field of Public Health in India were the holding of the WHO Rural Health Conference for South-East Asia (at which the importance of Family Planning work in Rural Health Development was stressed) and the Nineteenth International Red Cross Conference at which representatives of 84 nations were present—a record gathering in the history of the Red Cross Movement. Our Prime Minister's great love for children was responsible in a large

measure for the increasing attention that continued to be bestowed on the progress of child health programmes.

Before concluding we wish to convey to our readers, contributors and advertisers, our great appreciation of their hearty and willing cooperation, which has enabled us to report another year of useful work and steady progress. We send them our hearty felicitations and good wishes for a bright and prosperous New Year.

THE TWELFTH MADRAS STATE MEDICAL CONFERENCE

DELIVERING the presidential address at the Twelfth State Medical Conference held at Coimbatore on the 23rd November 1957, Dr. MATHURAM SANTHOSHAM sought to dispel the erroneous impression entertained in certain quarters that the Indian Medical Association was a trade union of doctors. Its true function was to bring under one banner all those who were ministering to the sick and to improve the medical service to the people. He would call the attention of the Central and State Governments, whose responsibility was to provide medical aid for the people, to the fact that a "disorganized medical profession could only function as scattered mercenary soldiers" in the war against disease. It is therefore, a matter for deep regret that the Government at the Centre and the States have consistently ignored the united voice of the profession and declined to accept the advice rendered by them through their Central Association. To cite an instance, in the matter of implementing the Employees' State Insurance Scheme, a scheme presumably designed for the benefit of the labourer and his family, the I.M.A. received a slap on its face when the Government declined to introduce the panel system recommended by the association as being the most suitable for our country. By rejecting this essentially sound plan "the Government," said Dr. SANTHOSHAM, "had trampled on the fundamental right of the worker, to choose his doctor when he was ill. Government betrayed thereby their ignorance of doctor-patient relationship."

The ANTISEPTIC has all along stoutly championed the cause of the I.M.A. and its rightful claim to function as the chief advisory body to Government (on the analogy of the British Medical Association) in all matters relating to medical and public health measures of legislation. The Central and State Governments really stand to gain a great deal in every way by giving official recognition to this status and so we strongly reiterate this plea and ask Government to realize that the I.M.A. is not a selfish belligerent group, and that its members are only actuated by one single and noble aim, viz., the relief of human suffering, at all levels.

Dr. SANTHOSHAM pleaded for the standardization of all indigenous medicines which have been found effective and useful in several maladies. He considered that the traditional practitioners of the Ayurveda, Siddha, Homœopathy and Unani systems should be promptly registered and people allowed to choose whatever system they elected to have. But he was not in favour of Governments recognizing and subsidizing these systems. We are however, afraid that it is now too late in the day to halt the progress being made in this direction by the Centre and State Governments in order to meet the insistent demands of the people.

Dr. K. N. WAGHRAY presiding over the Andhra Pradesh Medical Conference at about the same time in Hyderabad, also suggested the compilation of a register of all those practising medicine and the prohibition of future entrants unless they were qualified. The Finance Minister of Andhra Pradesh, Mr. B. GOPALA REDDI, holds that the M.B.B.S., must be the minimum qualification for a doctor and he looks forward to more and more persons undergoing post-graduate courses and then coming forward to man our medical colleges.

Referring to the recent import restrictions which have worked a great hardship to the ailing common man, Dr. SANTHOSHAM observed that "it is appalling to think that after the free availability of Chloromycetin till now, patients in Government hospitals suffering from enteric, should hereafter get treated by antiquarian methods because the Government will not buy the drug for the poor man who cannot afford to buy his own. If death through lack of food is considered a blot to efficient Government, certainly, death through lack of drugs also is equally a slur." There is no doubt that these import restrictions which affect very essential drugs is likely to produce alarming results. Articles of diet and life-saving drugs of a very essential nature which cannot be replaced by other equally good substitutes will not be available any more for our patients. We are not trying to be anti-national when we protest against this policy. Lives cannot be sacrificed to save dollars and pounds sterling. Government should immediately repeal the restrictions placed on life-saving remedies, diet articles and children's foods.

Dr. SANTHOSHAM's answer to the problem of rural medical relief is what we have ourselves often pointed out in this journal, viz., the proposed 'Health Assistant.' To every qualified rural doctor stationed in a taluk headquarters or medium-sized town, 6 to 12 health assistants stationed in villages might be attached, and the doctor could visit the station of every health assistant every sixth day in Government-owned jeeps. This scheme of health assistants should be implemented during this Five-Year Plan period.

We are in full agreement with Dr. SANTHOSHAM's criticism regarding the discrimination shown against independent practitioners and honoraries in the matter of certification.

The conference requested the Union and State Governments to retain English as the medium of instruction in high schools and colleges "in the interest of progress of national and international science and literature." It urged the State Government to ban the sale of antibiotics by chemists or other licence-holders, except on a prescription by a registered medical practitioner.

The conference was of the opinion that the proposed amendment to Rule No. 25 of the Drugs Rules published in the Gazette notification of September 1957, was "unnecessary as it will throw needless additional work on the already overworked medical practitioners and will further involve needless inspections by Government Officers, and if any such safeguard is required under the Drugs Rules the Indian Medical Association and the Madras Medical Council may be asked to suggest suitable measures."

It requested the Government to classify all practitioners of modern medicine of five years' standing and more as essential services on a par with Government medical officers.

The conference also suggested that the panel system should be preferred in implementing the Employees' State Insurance scheme and the medical practitioners in the area where the scheme was introduced be given preference for being employed in paid dispensaries under the E.S.I. Scheme.

THE NURSES IN INDIA

(The Nursing Council Act)

THERE was an animated debate in the Rajya Sabha on the 18th of November 1957, on the Nursing Council (Amendment) Bill seeking to increase the strength of the Council, to facilitate the registration of Indian citizens holding foreign qualifications and to maintain an All India Register of Nurses and to give greater representation to Nursing Colleges on the Council.

It will be recalled that the Bhore Committee in their report stressed on the need for the creation of a better standard of national health through development of an organized health service on modern lines, which included among several items a long and a short term programme relating to the training and recruitment of a large number of nurses, which should be increased from 7,000 (in 1947 the time of their report) to 80,000 in ten years eventually rising to one nurse for every 500 of the population, so that by 1971 there would be nearly two and a half lakhs of nurses in India. Much water has flown under the bridge since then; and in the ten and odd years that have elapsed, the progress made

towards the realization of those better standards has been inadequate and even halting; this is especially the case with regard to the nursing profession.

There has no doubt been an increasing awareness amongst the people of the need for more qualified nurses and of the position they should occupy, their importance and their duties. But the small progress made in the remedial measures to achieve the desired result was due to persistent agitation instead of being spontaneous. A charge was levelled in the Rajya Sabha during the debate by the former Union Health Minister, RAJKUMARI AMRIT KAUR, not without reasonable justification, to the effect that "if there is one profession where sweated labour can be said to exist, it is the nursing profession". The RAJKUMARI, during her term of office, had done her very best towards improving the lot of the nurses in India consistent with the resources and facilities she was able to get from the Government.

The Health Minister explained some of the proposed changes in the constitution of the Indian Nursing Council to increase the number of its members. One of the changes sought to increase the representation of M.Ps. from two to three.

The debate in the Rajya Sabha was characterized by a certain amount of wrangling over certain amendments, though there was an unanimous plea from all sections of the house, for improving the service conditions of nurses and for uniformity and a higher standard of training.

Replying to the debate, the Health Minister, Mr. D. P. KARMARKAR, assured the House that it had always been the attempt of the Government to bring the training of nurses to as high a level of efficiency as possible. The Government was also trying all it could to meet the need for more nurses in the country. He agreed, in principle to a suggestion for a short course in nursing for school and college girls. He was confident the Government and non-official agencies would be able to meet the country's increasing requirements in regard to nursing. There was no doubt that both in respect of the quality of education to nurses and of their services, the country was now in a much better position than ten years ago. His predecessor, RAJKUMARI AMRIT KAUR, had done quite a lot in this field and what she started would be carried through. Old prejudices against the nursing profession were disappearing and today it was a question not so much of inviting candidates into the profession, as of refusing admission into the training institutions.

In 1947 there were 7,000 nurses in the country and today there are 18,000. During the Second Five-Year Plan another 9,000 would be trained according to schedule. The suggestion put forward by some of the speakers that quality could be sacrificed to quantity in order to meet the increasing demands, will certainly be a retrograde step if accepted and we are glad

Mr. KARMARKAR rightly refused to accept it. At best there could be a compromise between the two as a temporary expedient just to tide over the present paucity of nurses. There should be, to our mind and way of thinking, a still greater public awareness and conscience which alone will bring about an early fruition of the plans for an adequate nursing service to meet the country's needs. Nurses are entitled to very great respect as they belong to a profession which is precious to the interests and welfare of the country. No sweated labour should be taken as Mr. KARMARKAR observed in replying to the debate, from student nurses by exploiting them as full time nurses though it was really good for the students to acquire as much experience as possible. We are glad that the Bill was eventually passed by the Parliament on the 29th of November last, and we hope the provisions of the Act will be implemented as soon as possible.

ACUTE IMMEDIATE REACTIONS TO PENICILLIN

Acute immediate reaction after injections of penicillins occurred in 12 patients from general practice. They were divided in 3 groups. The first group consisted of 2 physicians; 1 of them had a painful boil inside his nostril and was given an injection of 1 million units of crystalline penicillin followed immediately by one of 900,000 units of procaine penicillin in aqueous suspension. Nausea, swelling of the upper lip, and a greatly accelerated and irregular pulse rate developed 15 minutes after the injection and were followed by loss of consciousness for 2 hours. One week later large urticarial lesions occurred over the entire body. A similar reaction occurred in the other physician after an injection of procaine penicillin in aqueous suspension which he administered to himself. Both men had received many previous injections of penicillin, and it is suggested that the untoward reaction was due to intramuscular injection of penicillin in sensitized persons. Group 2 consisted of 6 patients, 3 men and 3 women between the ages of 34 and 60 years. Two of these patients received crystalline penicillin and 3, procaine penicillin, and the reactions in these were produced by accidental intravascular injection or back-seepage in slightly sensitized persons. The 6th patient had been given an injection of penicillinate hydriodide, and his reaction may have been due to the known toxicity of this compound, since subsequent injections of procaine penicillin were given without untoward reactions. The third group consisted of 4 patients, 2 men and 2 women between the ages of 21 and 56, in whom the reactions were caused by accidental rapid intravascular injection of procaine penicillin suspensions.

A scheme for minimizing the incidence and severity of these reactions is outlined. It includes reduction of incidence of sensitization by confining oral and parenteral administration of penicillin to cases with clear indications and by abandoning topical application of penicillin; careful history-taking; and dermal and intradermal tests with solutions of crystalline penicillin in allergic patients with previous mild reactions. The interval between individual injections of a course of penicillin should never exceed 10 days, the time required for sensitization to become established. Careful technique of injection should be used. All patients who once had an acute immediate reaction from the administration of penicillin should be given a card indicating this fact, and this card should be carried in the wallet or handbag. Suggestions are made for treatment.—(G. W. Lewis, *Brit. M. J.*, 1: 1153-1157, May 18, 1957 London via *J. of Am. Med. Assoc.*).

TREATMENT OF THE TOBACCO HABIT WITH LOBELINE

Dr. B. Ejrup (*Svenska lakartidningen*, Oct. 12, 1956) has explored the capacity of lobeline to break the tobacco-habit by giving injections of a synthetic preparation of lobeline hydrochloride to 133 persons anxious to rid themselves of this habit. Among the 101 who took a full course of injections were 16 women. The first 10 were treated as in-patients and the rest as outpatients. In 10 patients this treatment was given for cramps of vascular origin in the legs; in 13 for heart disease, in 30 for smoker's cough, in 17 for gastritis, in 12 for nervous disturbances, and in the rest for various other ailments. Fear of lung cancer was not a common incentive to combating the tobacco habit; but hygiene and the expense involved were. The drug was usually given subcutaneously, and its action was checked by the use of a placebo. A good effect (consumption of tobacco reduced to *nil* or 75% of the original consumption) was achieved in 73% of the patients receiving lobeline and in 50% of those receiving the placebo. If only those who gave up tobacco completely were considered, a good result could be claimed for 44% of the group treated with lobeline of 19% of the group given placebo. Lobeline seemed to induce a state of tobacco satiety, with the loss or diminution of a craving to smoke. Some patients said the cigarettes became tasteless, but while the treatment lasted there was no disagreeable taste in the mouth or other discomfort while smoking. Three patients noted a slight nausea about an hour after an injection. In view of the good results noted in some patients receiving only a placebo, Ejrup concluded that suggestion may play an important part in this treatment.—(*J.A.M.A.*, p. 301, 26-1-'57).

SYME'S AMPUTATION

R. I. Harris discusses the differences of opinion as to the use of Syme's amputation expressed by military surgeons in Canada, Great Britain and the United States of America. He refers back to Syme's original record published in 1843, twenty-three years before Joseph Lister's experiments in antiseptic surgery, and three years before the administration of the first ether anæsthetic at the Massachusetts General Hospital. Syme's concern was a simple and safe method, and his success indicated the safety of his method in an era when infection was most common. The author points to Syme's second consideration that the method provided "a stump seemly and useful for support and progressive motion." This allows for the important fundamental principles of end-bearing amputations. The lower extremity propulses and bears weight. Weight-bearing is best when the stump is end-bearing. Propulsion is best performed by lengthening normal functioning joint and muscles above the amputation. Essential requirements for end-bearing are: (1) A cross section as great as possible to give a broad area of support. (2) Ability of the whole cut surface of bone to bear weight; this is achieved with cancellous bone, or in the ankle by retaining subarticular cortical bone at the lower end of the tibia. (3) Appropriate skin and subcutaneous tissues. Only two areas meet this requirements—the lower end of the femur covered by prepatellar skin, and the expanded ends of tibia and fibula covered by a heel pad. The author lists the advantages of this method; the stump takes full weight, and this ability is retained to the end of the patient's life; the stump is of nearly normal length; the patient can stand for long periods, undertake heavy work, and walk even without a prosthesis. The author states that the main disability from this method is the broad base and the unsightly prosthesis. The position has been improved by the use of plastics.—(*J. Bone and Joint Surg.*, Aug. 1956 via *The Med. Journal of Australia*, 3-8-1957).

Special Feature

NEWSLETTER FROM THE UNITED STATES

Some of the newer diagnostic aids are proving simpler than the old established ones. The technique of "washing" for the detection of cancer has proved successful, but is not yet intended to be a substitute for other diagnostic tests. W. L. Watson, speaking at the annual Congress of the International College of Surgeons in Illinois, reports that oesophageal washings are now aiding in the diagnosis of cancer. The technique is particularly useful when other diagnostic methods are difficult to use. In this series of 192 patients with suspected cancer, 130 (or 67 per cent) showed evidence of cancer cells from oesophageal washings. In addition to corroborating other positive cancer tests, the washing technique also gave positive evidence of cancer in many patients on whom other tests were negative. There were no false positive diagnoses. E. Watson reports from the University of Michigan that diseases considered killers in the past, such as smallpox, diphtheria, whooping cough and scarlet fever, are being successfully controlled by immunization. He warns, however, that these diseases are still potentially dangerous and that in order to prevent them from ever reaching epidemic proportions again, immunization programmes should be adhered to Cervical smears obtained from women who have just given birth to a child often are suspicious of cancer, according to R. H. Kaufman and co-workers. Their findings, reported in the October 12 issue of the *Science Newsletter* (72: 233, 1957), show that cell changes in women after childbirth usually result from temporary infections or injuries and, in time, become normal. Breast feeding also may give rise to suspicious cervical smears since suppression of ovarian hormones causes the outer layer of the cervix to shed a large number of cells. Although this condition is probably not cervical cancer, women showing abnormal cells should be followed adequately until the irritating factors of pregnancy can be ruled out as a cause E. G. Knouf, speaking before the Fifth Annual Antibiotics Symposium in Washington, D. C., praised the effectiveness of Chloromycetin when used in conjunction with gamma-globulin. In his series, 10 patients, who did not respond to antibiotics alone, showed marked and rapid improvement when Chloromycetin was administered with gamma-globulin. The course of treatment, according to Dr. Knouf, was so short that only about one-third the usual amount of antibiotics was necessary to effect a cure Sludging of blood (or clumping of red blood cells) appears to be a reaction to physical or emotional strain. E. P. Fowler, a New York otolaryngologist, reports in the October issue of the *A. M. A. Archives of Otolaryngology* (66: 408, 1957) that several ear disorders are brought about by blood sludging caused by emotional difficulties. Dr. Fowler observed sludging in several types of deafness, in Meniere's disease, and in otosclerosis. He believes that sludging clogs blood vessels, prevents the normal flow of blood, eliminates the exchange of oxygen, and finally damages cells. Patients with otosclerosis who are found to have sludging, also gives histories of emotional instability. Meniere's disease and otosclerosis are both aggravated by seemingly trivial emotional problems. Treatment should include an attempt to resolve emotional difficulties and to help the patient adjust to his problems A new study undertaken by M. Greenberg and co-workers modifies the figures previously reported on the incidence of congenital malformation occurring in the off-spring of mothers who contracted German measles during the first three months of pregnancy. Their report, appearing in the October 12 issue of the *Journal of the American Medical Association* (165: 675, 1957), states that the percentage of malformations is about 9.7 per cent rather than previously reported rates of up to 100 per cent. Dr. Greenberg and co-workers based their study on 103 women who contracted German measles during their first three months of pregnancy, and deduced their percentages from investigation of how many of these women

produced live offspring who were defective. The excessively high percentages noted in previous reports resulted from failure to include children who were born normal. Instead of starting with the mothers and recording the number of defective offspring, the studies began with a number of malformed children and traced back to the mothers. . . . Rest is not the best remedy for all states of fatigue, according to T. G. Klumpp, reporting in the October 5 issue of the *Journal of the American Medical Association* (165: 605, 1957). Occasional fatigue is a normal condition and should be treated only if it changes noticeably or prevents the accomplishment of normal activities. Although fatigue is an expected accompaniment to old age, it can be minimized with the acquisition of new interests and an increased incentive for living. In the "push button" era of American life, there is a tendency to minimize the necessity for physical activity and there is increasing evidence that young persons are suffering from atrophy of disuse before their time. . . . A new surgical procedure improves paralytic foot-drop. G. D. Caldwell described the technique at the annual Congress of the International College of Surgeons in Illinois. Paralytic foot-drop is a condition in which the foot hangs limply because the muscle that raises the fore-part of the foot is not functioning. Dr. Caldwell reports that in 12 of 13 patients studied in his series, the only active muscle controlling the foot was the gastrosoleus. His technique consists of splitting this muscle and by transplanting half of it to the dorsum of the foot. Better results were obtained by transplanting the medial half of the muscle than were obtained by use of the lateral half.

RECENT ADVANCES IN OCULAR SURGERY

Cataract surgery:—Dr. Gipner reported as the most important recent advances: (1) The cosmetic and functional improvement resulting from round-pupil intracapsular extractions; (2) procedures which have increased safety, such as adequate sedation before operation, extraocular muscle immobilization and lid akinesia; (3) production of a soft eye by retrobulbar muscle cone injection and (4) use of corneoscleral sutures, which permit monocular dressing and early mobilization of the patient.

Dr. Scheie said that the introduction of Thorazine as a preoperative quieting drug is one of the most important recent advances.

Dr. Gipner reported that modern linear extractions for soft congenital cataract are replacing older operations, such as multiple needlings.

Glaucoma surgery:—Diagnosis of chronic simple glaucoma is no longer an indication of operation. Two prime indications are: tension fairly constant at 35 mm. Hg. or more; or loss of field. Recent review of glaucoma records revealed several cases of bilateral glaucoma of equal severity in both eyes in which only one eye had been operated on years previously. The eye that had been operated on was all too often lost, blind or with poor vision from cataractous changes, while the fellow eye that had been treated medically had suffered no loss of vision. It is advisable to operate only when true indications exist. Dr. Scheie's operation of choice is iridencleisis; trephinations on eyes with wide angles are sometimes done.

Early operation of juvenile glaucoma is advisable; in these cases the chance of preserving vision throughout life is slight.

Either goniotomy or goniopuncture can effectively control ocular tension in infantile glaucoma. Dr. Scheie often combines the two procedures, doing a goniopuncture after completing the sweep of the knife for the goniotomy.—(*Archives of Ophthalmology*, 57: p. 134, January 1957 via *Ophth. Reviews*, 1957).

GLEANINGS FROM THE MEDICAL PRESS

MEDICINE & THERAPEUTICS

Pulseless disease.—(*Am. J. Med.*, 22: 331, 1957 via *General Practitioner*).

Pulseless disease is characterized by the absence of pulsations in the carotid and radial arteries. The diagnosis of pulseless disease is primarily one of exclusion, according to Kinney. A similar pulseless state may be caused by syphilitic arteritis and somewhat less commonly by syphilitic aneurysm. It also occurs rarely in dissecting aneurysm and after injuries of the thorax. When these conditions have been excluded, there remains a group of patients consisting mainly of young and middle-aged women in whom the aetiology is unknown. "Pulseless disease" has been used to designate this group.

The symptomatology is predominantly that of occlusion of the internal carotid—headache, vertigo, convulsion, paresis and hemiplegia may occur. Hypersensitivity of the carotid sinus has complicated several cases. Usually there are no symptoms from the occlusion of the radial artery because the collateral circulation is adequate. Since the aetiology is unknown, treatment is unsatisfactory. Long-term anticoagulant therapy has been used. With further advances in arterial surgery, the surgical approach, although formidable, might be considered. In a case reported by the author, treatment was symptomatic, with papaverine being used during acute episodes and Priscoline for the long-term treatment.

Swimming as asthma treatment.—(*The Medical Officer*, 16-8-1957).

In our issue dated 28th December, 1956, we referred to a successful experiment in connection with asthmatic school children which was begun at the Hazelbury Day Open Air School Edmonton, in May, 1955. The essence of the treatment given was, and still is, breathing exercises and swimming lessons or more properly, as Dr. D. Regan, D.S.M.O., Middlesex, says in the

1956 annual report of Dr. A. C. T. Perkins, C.M.O.H. and P.S.M.O. "relaxation in the swimming baths." The success of this treatment during the first six months of the experiment was beyond question and it is very gratifying to learn from the report that the success was continued throughout last year, at the end of which 26 children had been treated. In 24 of those 26, we learn, attacks of asthma lessened, both in severity and in number. In several they ceased completely. Twenty four gained in weight, improved in general physique, in chest movements, or in correct method of breathing. It was found that swimming did not adversely affect the children in any way with two exceptions. One proved to be allergic to chlorine and treatment was abandoned, while the other, a boy, was apparently so scared of the water that he had an asthma attack each week-end. This fear he never conquered, says Dr. Regan, who is in charge of the scheme, and after he stopped swimming, his asthma lessened.

It is worth noting, in passing, that despite all that has been said and written against ultra-violet light therapy, 20 of the 26 children were given such courses and that all appeared to derive benefit therefrom.

OBSTETRICS & GYNÆCOLOGY

Lesions of the vulva and vagina.—(*The British Journal of Clinical Practice*, April 1957).

1. **Early leukoplakia:**—Appreciating the disinclination for destructive operations on the vulva, especially in younger women suffering from intractable pruritus vulvæ, there have been attempts this year to try the effect of surgical denervation of the vulva. Lateral incisions extending backwards from the mons towards the anus, are made in either labium majus, and these are undercut to a radius of 2 inches. This procedure is analogous to Ball's operation for pruritus and an operation which is still of value. Malignancy must be ruled

out by biopsy if necessary and all other discernible causes of pruritus eliminated. The results are often gratifying and at least enable vulvectomy to be deferred as long as marked skin changes are absent.

2. *Trichomonas vaginitis*:—It has recently been suggested that this troublesome infection, undoubtedly on the increase, is a systemic infection that requires parenteral therapy in both partners, combined with local therapy in the female as before. The need for a systemic approach being obvious, oral trichomonacides were hailed with some relief, but recent experience is disappointing. Even if negative swabs are obtained from the vagina the organism still lurks in Skene's glands or the urethra. Husbands may develop erythema multiforme under treatment by oral trichomonacides and other side-effects are becoming apparent, of which nausea, anorexia and discoloration of the urine are some. If coated pills in dosage of 2 per day are taken for 10 days reactions are minimal. Clearly, this form of therapy is much more rational, but it is tempting to speculate as to whether the post-war development of intestinal antibiotics is an aetiological factor since most gynaecologists of long experience will recall that this form of vaginitis seemed much rarer before World War II.

3. *Cancer of the vulva*:—Increasing experience is clearly showing that recurrences of cancer of the vulva seldom occur in the iliac and aortic glands. The recurrences are almost always local. This may have a bearing on the argument as to whether a high lymphadenectomy, going up above Poupart's ligament, is done, but it does stress the importance of the widest possible local excision.

The use of oxytocics in parturition.—(*Ned. Tij. V. Gen.*, 100: 25-2-'57 via *D.A.I.*).

Dr. Plate, Professor of Gynaecology and Obstetrics, Utrecht University, Holland, describes his method of inducing labour, especially when the woman is near term. First he administers one ounce (30 g.) ricinus oil

to increase the excitability of the uterine musculature. One and a half or two hours later an oral dose of 100 mg. (15 grains) quinine sulphate is given and an intramuscular injection of 2.5 U pituitrin, followed by quinine and pituitrin four times at hourly intervals, after which pituitrin alone is continued, four times at hourly intervals.

The action of quinine on the uterus has been known since 1872; it increases the resting tonus of the uterine muscle fibres, thereby increasing their excitability. Prof. Plate points out that four 100 mg. doses of quinine are quite innocuous to both mother and foetus, except in cases of allergy.

OPHTHALMOLOGY

Neisserian conjunctivitis.—(J. R. Huntzman, *California Medicine*, 84: p. 339, March '57 via *S.S. Review*, Summer '57).

The author feels that the use of penicillin solution topically was more effective than the intramuscular injection of the antibiotic or a combination of both injection and instillation of sulphanilamide solution and penicillin ointment in treating Neisserian conjunctivitis.

Different therapeutic regimens were used in a series of 45 cases. Seven patients received a combination of intramuscular penicillin and irrigation with a sulphanilamide solution. Two of these showed progressive disease after treatment. Sixteen other patients received penicillin intramuscularly and local instillation of penicillin solution. Every one of these showed favourable progress. One patient received penicillin intramuscularly plus penicillin ointment, but this therapy failed. Twenty-four others, including all those on whom other therapy had failed, received penicillin instillation and this group showed no failures on this specific therapy.

Even when only one eye was involved, treatment was initially given to both eyes; the unaffected eye was covered with a shield to prevent further infection. A solution of penicillin in saline, with addition

nephrene was used. For cleansing, a plain saline solution or other non-irritating irrigant is recommended.

No instances of sensitivity to penicillin were noted and no permanent defect after completed treatment.

Problems in the treatment of burns of the conjunctiva and cornea caused by chemical agents and heat.—(A. Pillat, *Eye Digest*, 1: p. 3, via *Sight Saving Review*, Summer 1957).

It is essential to start the treatment of chemical burns within the first moment after the accident, with copious irrigation of the eye. Solid corrosives, particularly lime, should then be removed from the conjunctival sac.

Second and third degree burns must be treated in hospital. The transplantation of mucosal membrane by Denig's method has been usual in these severe cases, and in the author's opinion should be performed immediately after the injury, if it is to be effective.

In the First Eye Clinic, Vienna, the treatment of choice is sympatol (oxyphenylmethylaminoethanol tartrate), synephrine, neosynephrine or corvasymptom. Sympatol, instilled every 15 minutes for six hours, and then at longer intervals, has proved so effective that for the last four years Denig's transplantation therapy has proved unnecessary. In most cases it has been possible to avoid symblepharon and destruction of the cornea and in lighter cases to achieve a slighter scar on the cornea than with other therapies. Evidently sympatol supplies protein to the injured tissue, and arrests the process of the burn.

SURGERY

The treatment of hæmorrhoids.—(C.A. Hinds Howell, M.D., M.B.O.P., *The Practitioner*, Feb. 1957, via *The Medical Review of Reviews*, May 1957).

Paramaceti, the modern name for which is spermaceti, is a wax derived from the head of the sperm whale. Its main ingredient is cetyl palmitate or cetaceum. This is the active principle in 'paramacetyl' tablets which also

include small amounts of ethyl hydroxyethyl cellulose and magnesium, to combat the constipation so often associated with piles. The 'inward bruise' referred above is probably internal piles and if so then there is historical precedent going back 360 years for the treatment described here. 25 cases of internal piles were given cetaceum in cachets and 25 cases were treated with 'paramacetyl tablets'. Treatment consisted of 3 cachets in the morning and 3 in the evening on the first day. Next day 2 tablets twice in the morning and evening and similarly on the third day. If this course was not effective within a week a second similar course was given. Alcohol and aperient were forbidden.

1st degree piles:—14 out of 23 cases were treated by the end of the first course. The other nine required 2 courses. 3 cases showed a delayed response—were cured at the end of two weeks after the treatment. 4 were failures all due to persistence of constipation.

2nd degree piles:—4 out of 7 cases were cured by one course. Others required 2 courses.

3rd degree piles:—Bleeding stopped easily but prolapsed piles tended to remain inflamed. In 8 out of 16 cases the condition completely subsided and in 3 the piles were reduced to 2nd degree prolapse. One patient relapsed after three weeks and again after 3 months responding each time to further treatment.

Medical treatment cannot cure a prolapsed pile. All third-degree and most second-degree piles require surgery. The aim of medical treatment is to give subjective relief, stop bleeding and to cause inflammation to subside. Within these limits cetaceum proved a successful form of therapy. Constipation must be corrected or medical treatment is doomed to failure.

Paramacetyl tablets are effective in most cases of 'acute piles'. Nearly all first-degree piles will respond to them. Bleeding in second and third degree piles is soon controlled. Subjective relief is remarkable.

REVIEWS OF BOOKS

The Voice and its Disorders—By MARGARET C. L. GREENS, L.C.S.T., Speech Therapist Stoke Mandeville Hospital, 1957, 224 pages. (Pitman Medical Publishing Co., Ltd.). Price 45,- net.

The purpose of this book is to provide a guide to doctors, laryngologists and speech therapists for the treatment of voice disorder. This book describes the anatomy, physiology and physics of normal voice production and attempts to correlate normal structures and function with pathological conditions and their treatment. The author, describes first the many types of voice orders which may occur in individuals and then gives an account of the aetiology, symptoms and treatment. Many cases are cited and the problems are described and discussed in a simple and practical manner. The book is full of good illustrations and diagrams and has a good bibliography. The printing and general get-up are good.

Aids to Clinical Examination—By J. NICHANI, M.D., Formerly Chief Medical Officer, Manipur and Principal Medical Officer, Sirohi State. 1953. 206 pages. (Kothari Book Depot, King Edward Road, Parel, Bombay 12). Price Rs. 6/-

This little hand book gives a good plan for methodical clinical examination of the patients. It contains chapters on Taking Medical History, Examination of the patient, Examination of the Cardiovascular System, Gastro-intestinal system, Dermatological Examination, Examination of Surgical and Gynaecological patients, description of some laboratory tests, Examination of sputum, stools, urine etc. It also contains an appendix giving some favourite prescriptions. This book is intended to serve as a bedside handbook for clinical investigation of the common ailments. We are sure the book will be interesting and instructive to students and general practitioners.

Physiology of the Nervous System—By E. G. WALSH, M.A., M.D., M.R.C.P. 1957. Illustrated, 563 pages. (M/s. Orient Longmans Private Ltd., 36A, Mount Road, Madras 2). Price 50 sh. net.

The purpose of this book is to place before those interested in clinical neurology an account of the physiology of the nervous system. On reading the book it will be found that an understanding of the common clinical problems can be achieved only by thinking in neurophysiological terms. It contains chapters on Nerve and Muscle, Somatic sensibility, "Applied Physiology of Pain," The Spinal Cord, The Labyrinth, The Cerebellum, The Cerebral Cortex, The Auditory System and the Temporal Lobes, The Visual System, The Cortical Control of Movement, The Sensory Pathway and Hypothalamus, Rhinencephalon and Frontal Lobes. It contains very useful material for the students of physiology and for those appearing for the higher Post-graduate courses. The book is profusely illustrated and very well got-up.

Lymphatics, Lymph and Lymphoid Tissue—By JOSEPH MENDEL YOFFEY, D.Sc., M.D., F.R.C.S., Professor of Anatomy, University of Bristol, and FREDERIO COLON COURTICE, M.A., D.Phil., D.Sc., F.R.A.C.S., Director Kanematsu Memorial Institute of Pathology, Sydney Hospital, Sydney. 1956. 510 pages, profusely illustrated. Edward Arnold (Publishers) Ltd., London and M/s. Orient Longmans (Private) Ltd., 36-A, Mount Road, Madras 2. Price 60 sh.

The functions of lymph and of the lymphatic system have been of great interest ever since they were first discovered. It is now believed that the main purpose of the lymphatics is to return to the blood stream the large protein molecules which slowly but continuously leak through the pores of the capillaries. The role of the proteins in maintaining the volume of

the circulating plasma and the function of the lymphatic vessels in returning extravascular protein to the blood stream form the thesis throughout this monograph. Closely associated with the lymph and blood streams are the tissues which we designate as 'lymphoid'. These are composed of several different kinds of cells, which are intermingled in various proportions and in which the most numerous elements are lymphocytes.

Beginning with a chapter on General Management and Organization of the Lymphatic System, the author proceeds to discuss the formation of lymph and the physiological significance of regional lymphatics. There are chapters on lymph flow, biological significance of lymphoid tissue and the lymphocyte. The last chapter is devoted to a detailed description of some of the disorders of function involving lymphatics. The whole book deals with the difficult subject in a thorough manner. The first edition of this book appeared in 1939 and many

of the advances in our knowledge of the lymphatic system since then have been incorporated in the present edition. The book is profusely illustrated and each chapter has a very exhaustive bibliography of references. There is also a very comprehensive index at the end. The printing and the get up of the book are very good.

BOOKS RECEIVED

Freedom of the Individual in the USSR—Published by the Information Department of the USSR Embassy in India, New Delhi. Pp. 63. [Price 20 nP.

The Standard of Living in the USSR—Published by the Information Department of USSR Embassy in India, New Delhi. Pp. 102. [Price 20 nP.

Adhunik Chikitsa : Telugu—By Dr. Y. Suryanarayana Rao, L.I.M. (Indian Medicine House, Governorpet, Vijayawada). Pp. 400. [Price Rs. 5/-

PREPARATIONS AND INVENTIONS

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—(Dr. A. P. Norman, M.D.)

NEWS AND NOTES

W.H.O. Consultant's Tour

Mr. R. F. Farr, Deputy Chief Hospital Physicist at the Christie Hospital and Holt Radium Institute, Manchester is touring India and visiting various radiological centres in India with the purpose of giving lectures at centres of radiology and advising doctors on radiation protection in the diagnostic and therapeutic applications of X-rays and radium therapy. Dr. Farr is WHO consultant on hospital physics.

Trachoma as a cause of Blindness in India

Inaugurating the three-week National Seminar on Communicable Eye Diseases at the Institute of Ophthalmology and Gandhi Eye Hospital, Aligarh, Dr. C. G. Pandit, Director of the Indian Council of Medical Research, described trachoma as a major single cause of blindness in India. He laid stress on the vastness of the problem and the need for evolving techniques and procedures and training of personnel for a mass control programme. A pilot project in Aligarh has been established with the active co-operation of the Government of India and the WHO.

Several other eminent medical men like Dr. C. Mani, WHO Regional Director for South East Asia, Dr. T.R. Tewari, Assistant Director General of Health Services, Government of India, Dr. M. Radovanovic, Senior WHO Officer at the Trachoma Pilot Project took part in the seminar.

New Vice-President of Merck, Sharp and Dohme International

The Board of Director of Merck & Co. have elected Huskel Ekaireb a Vice-president of Merck, Sharp and Dohme International with responsibilities for the firm's operation in the Far East and South Africa. Born in Malaya and educated in India, Mr. Ekaireb joined the company's foreign organization in 1949. In 1955 he was named General Manager for the Far East and South Africa. His headquarters will be in New York.

New I.C.I. Research Laboratories

In October, a new Pharmaceutical Laboratory of Imperial Chemical Industries was opened in U.K. by Lord Waverly, a former Chancellor of the Exchequer, costing about two crores of rupees it is claimed to be the most advanced of its kind in the world and is equipped with every modern research aid. An interesting feature of the laboratory is an isolated animal house which cost over Rs. 32 lakhs. Here animals are bred free from natural disease.

The New Mysore Medical and Pharmaceutical Directory, 1958

It has been decided to publish a new Mysore Medical and Pharmaceutical Directory. It will deal with details in the fields of medical, dental and pharmaceutical progress in the new Mysore State and will be ready early in 1958. Details of this publication may be had from the New Mysore Publishers, Dharwar.

Buchanan Medal Awarded for Antimalaria Work

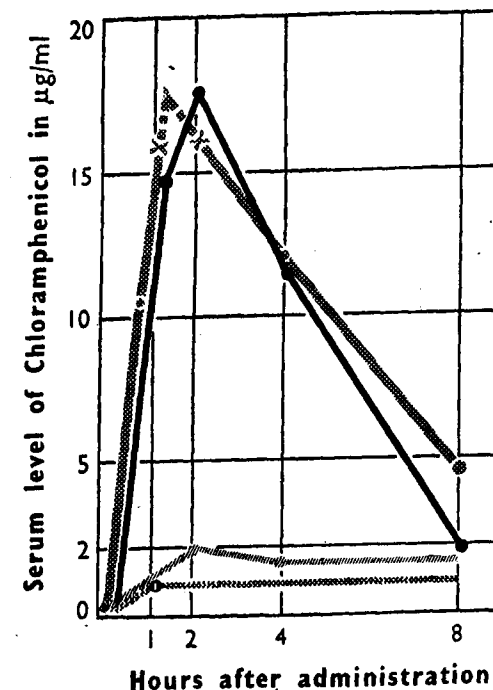
A former Tata Professor of Tropical Medicine at Bombay University, Australian-born Sir Neil Hamilton Fairley has been awarded the Royal Society's Buchanan Medal for his distinguished contributions to the control of malaria. Sir Neil is now 66 years, and has had a very distinguished career in medicine. He was President of the Royal Society of Tropical Medicine and Hygiene from 1951 to 1953 and Wellcome Professor of Tropical Medicine at the London University from 1946 to 1949. He holds degrees from the Universities of Melbourne, Adelaide, Edinburgh and London.

Diabetic Association of India

The Diabetic Association of India is having its third Diabetes Detection Drive in the first fortnight of February 1958. This campaign is intended to encourage the detection of Diabetes at an early stage. Further information can be had from:—The Secretaries and Treasurers, Diabetic Association of India, Maneckji Wadia Bldg., 1st Floor, Mahatma Gandhi Road, Bombay-1.

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do " 20 lac RIT ...	1-75
do in oil 30 lac. SEPBA ...	1-30
do do 100 vials lot. ...	1-25
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Ephdr. Hydrochl. 1/2gr 1000s Tab. Ld., ...	4-50
Calci. Gluc. 7 1/2gr. 1000s " ...	5-75
Calci. Lactas 5 gr. 1000s " ...	3-50
Aspirin 5 gr. 1000s " ...	6-50
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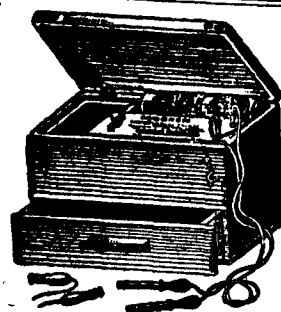
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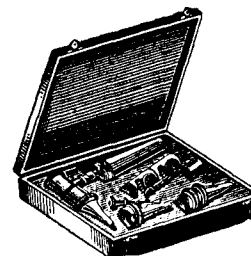
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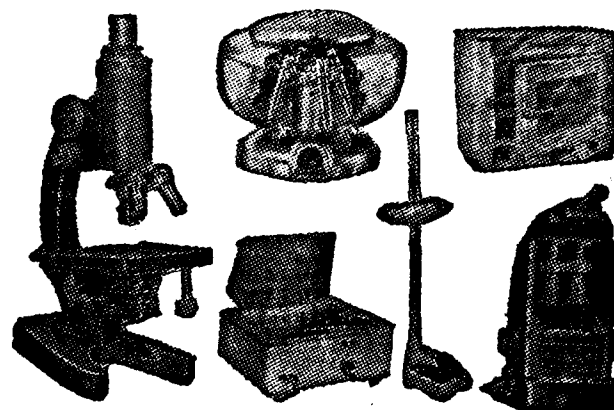
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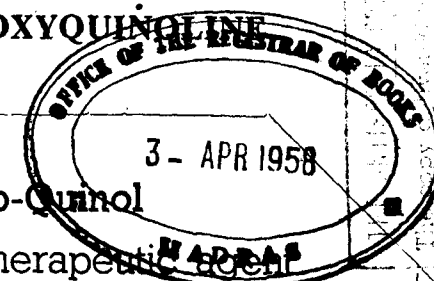
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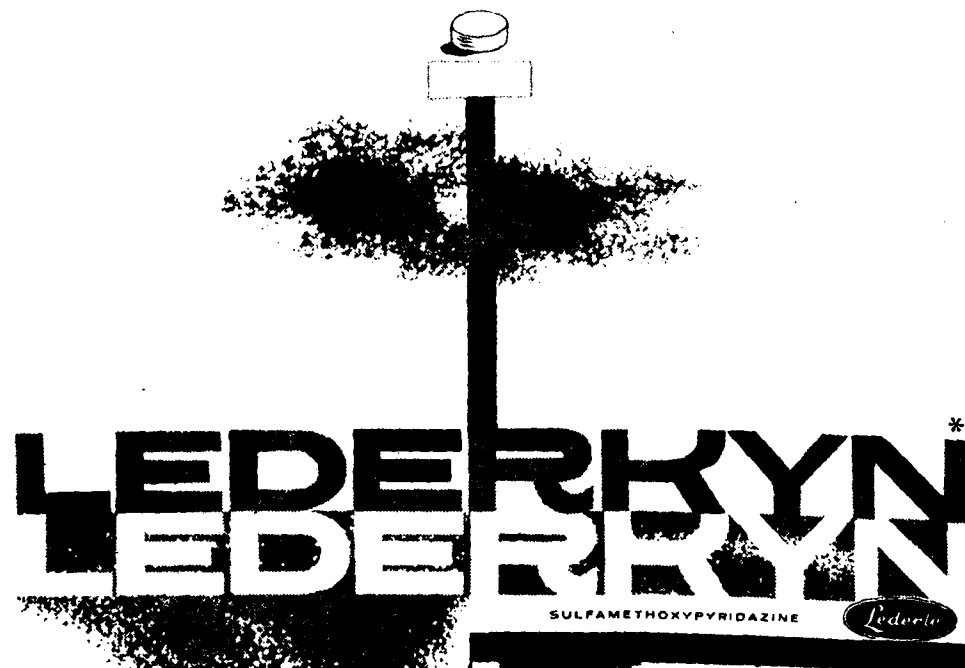
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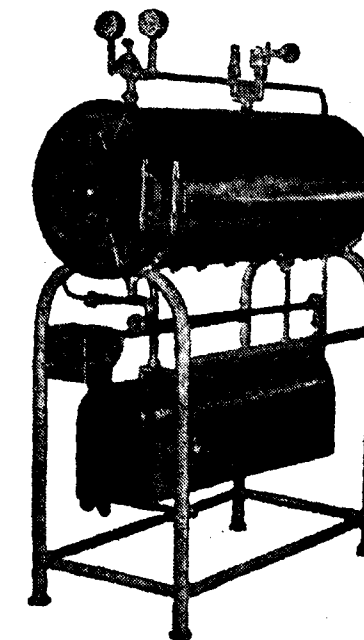
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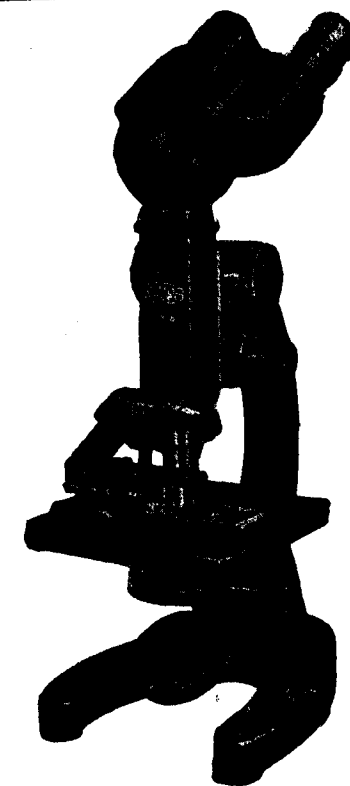
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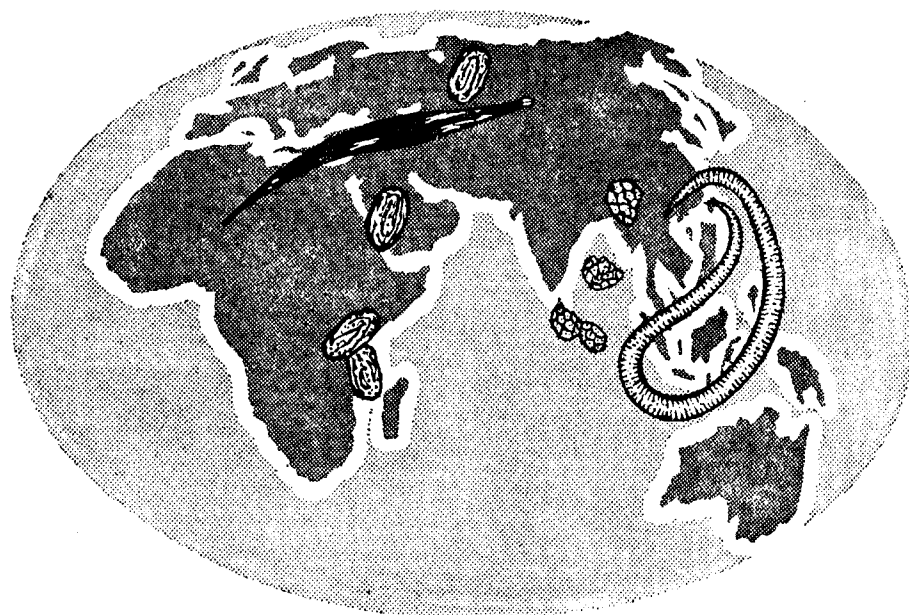
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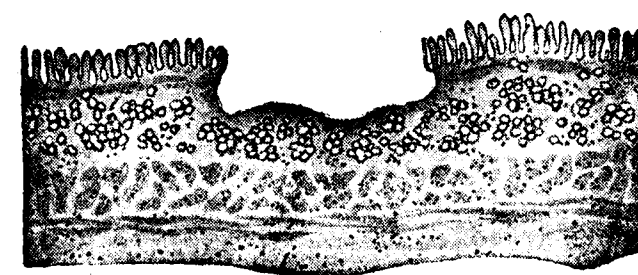


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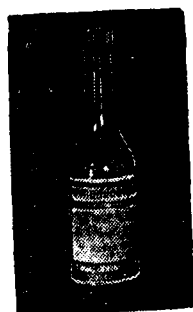
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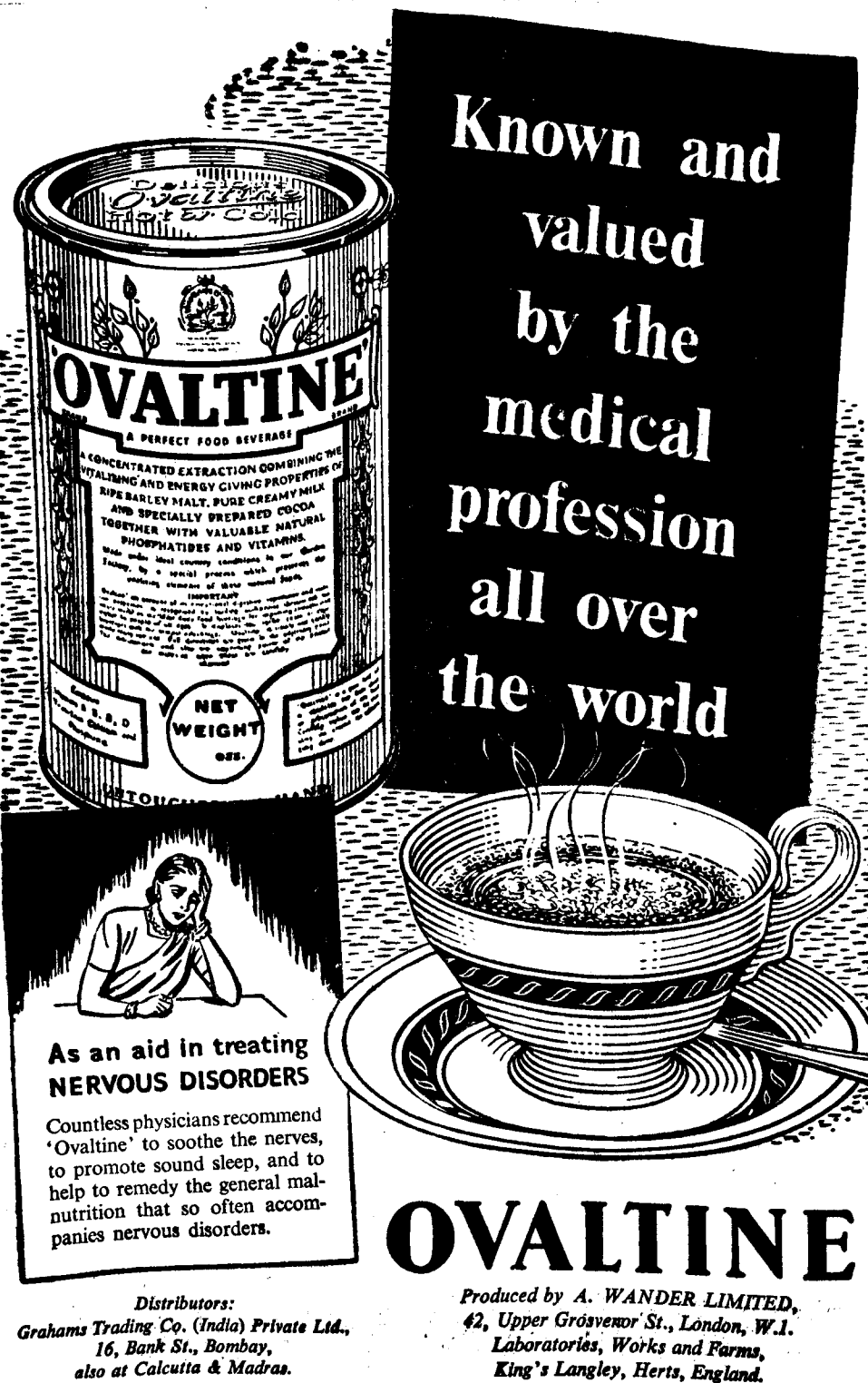
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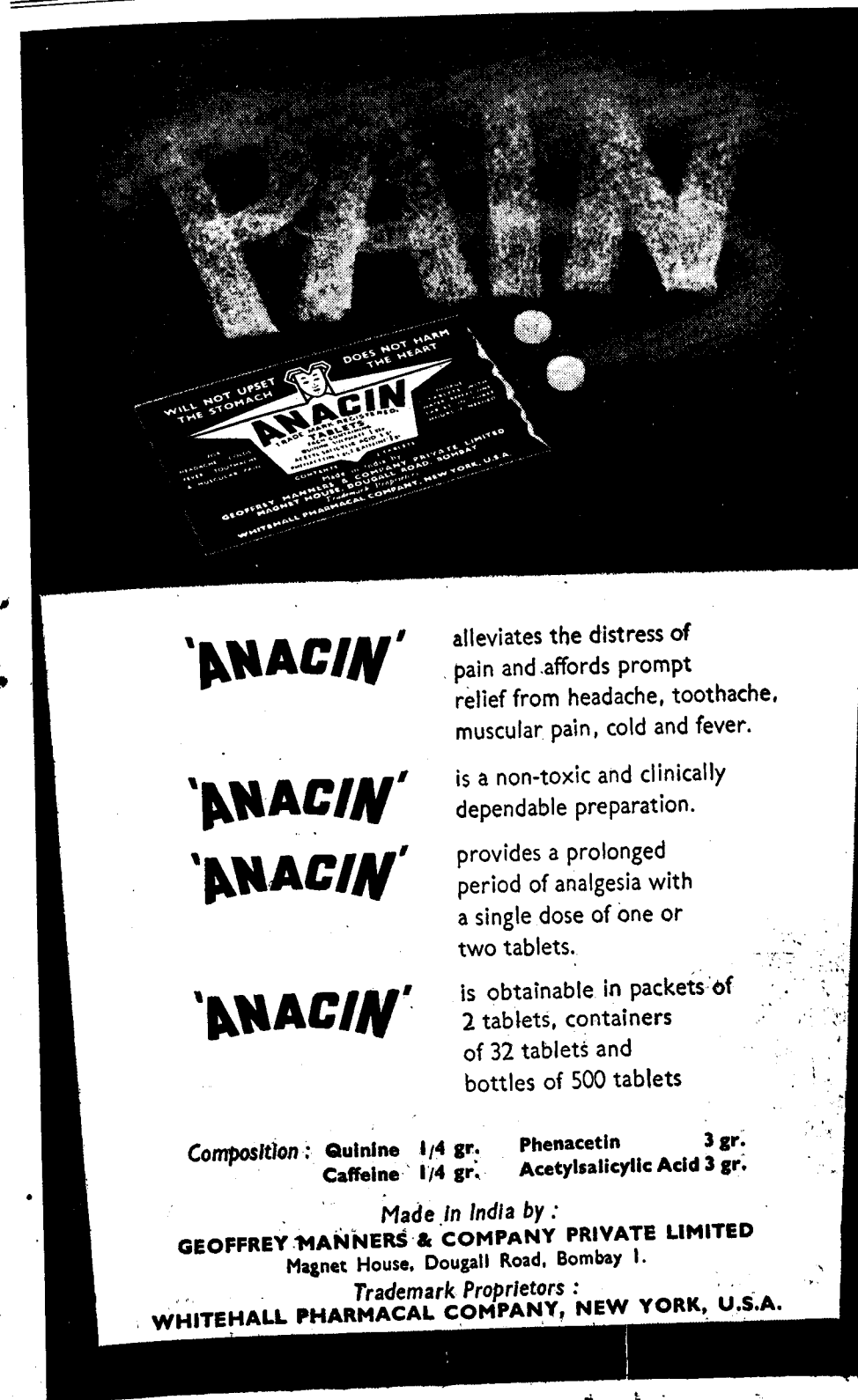
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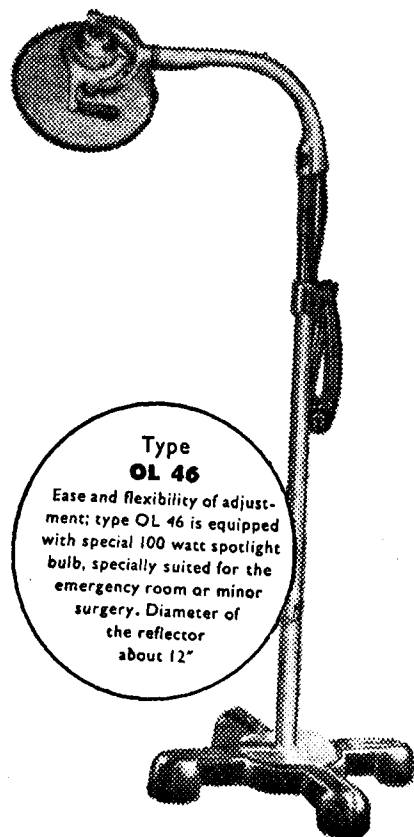


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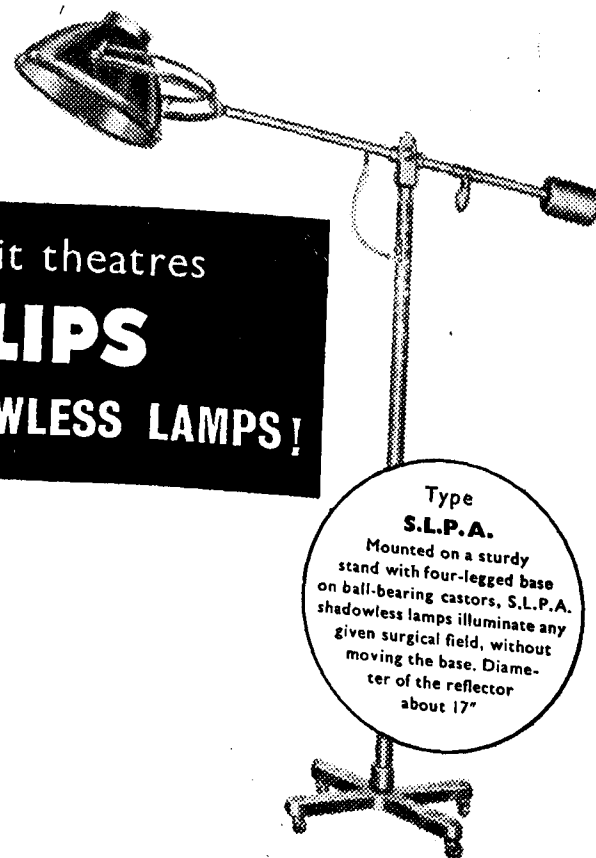


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PHILIPS mobile shadowless lamps give colour-corrected, heat-filtered, glare-free light. Built on heavy, cast-metal, four-legged bases, with ball-bearing castors, Philips operating lamps are ideally suited for all types of surgery work.

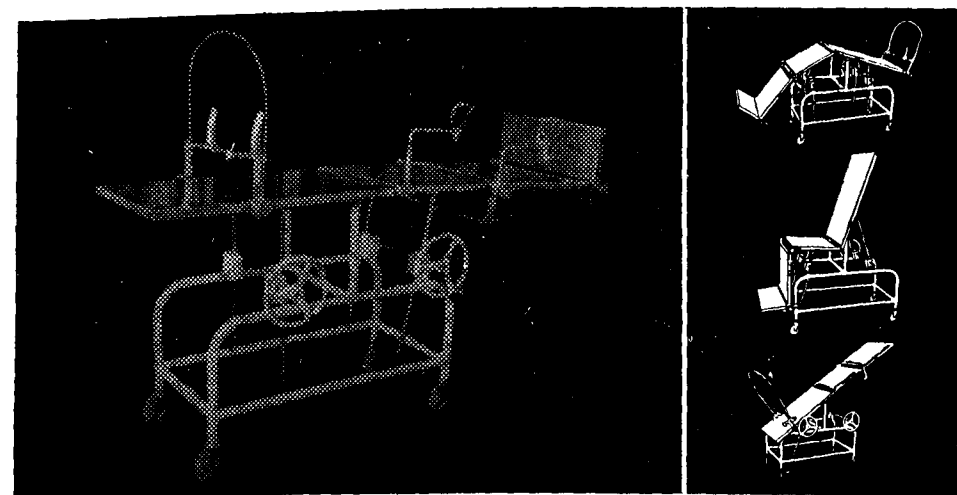
PHILIPS INDIA LIMITED



Type
S.L.P.A.

Mounted on a sturdy stand with four-legged base on ball-bearing castors, S.L.P.A. shadowless lamps illuminate any given surgical field, without moving the base. Diameter of the reflector about 17"

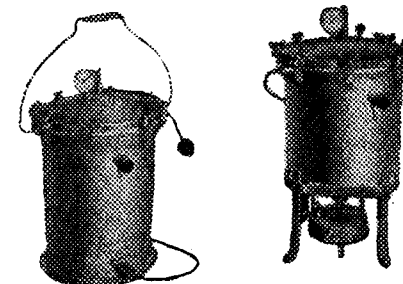
Designed to provide required positions—
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PORTABLE HIGH PRESSURE STERILIZERS



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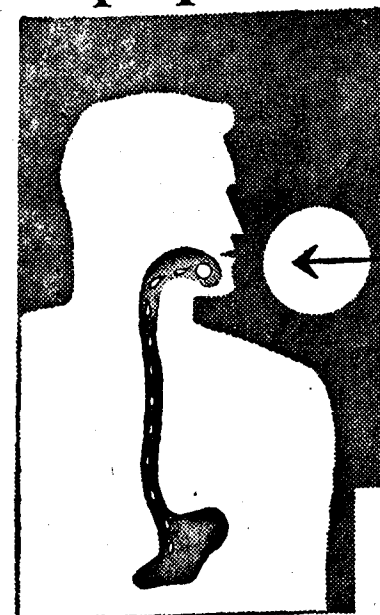
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INJECTABLE &
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Multiple vitamins in pleasant tasting liquid and painless Injectable. Vimix Liquid provides Vitamin B12 and Folic Acid also for the first time in a multivitamin preparation.

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The key to successful peptic ulcer therapy



WHENEVER continuous neutralization of gastric acidity is required—in active and quiescent peptic ulcer, gastritis, hyperacidity—NULACIN TABLETS are indicated.

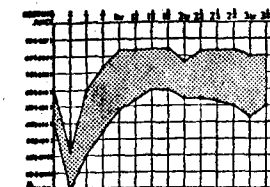
The successful clinical behaviour of NULACIN TABLETS is accounted for by their composition and unique manner of use.

Dosage

Beginning half-an-hour after food a NULACIN TABLET should be placed in the mouth and allowed to dissolve slowly.

During the stage of ulcer activity up to three tablets an hour may be required. For follow-up treatment the suggested dosage is one or two tablets between meals.

NULACIN TABLETS are not advertised to the public and there is no B.P. equivalent. NULACIN TABLETS are available in dispensing units of 12 & 25 tablets.



Gastric Analysis

Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.



Gastric Analysis

Same patients as in Fig. 1 two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.



NULACIN

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CALCUTTA

REFERENCES

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- Management of Peptic Ulceration in General Practice, Med. World, Dec., 1954, 2: 591

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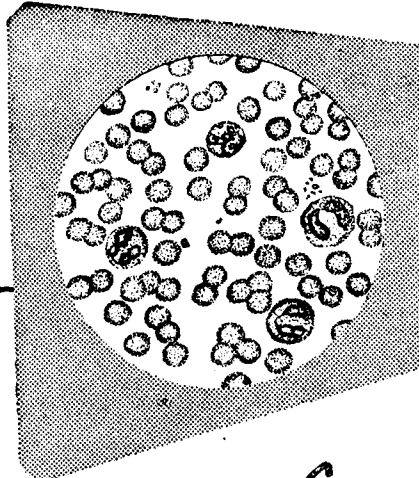
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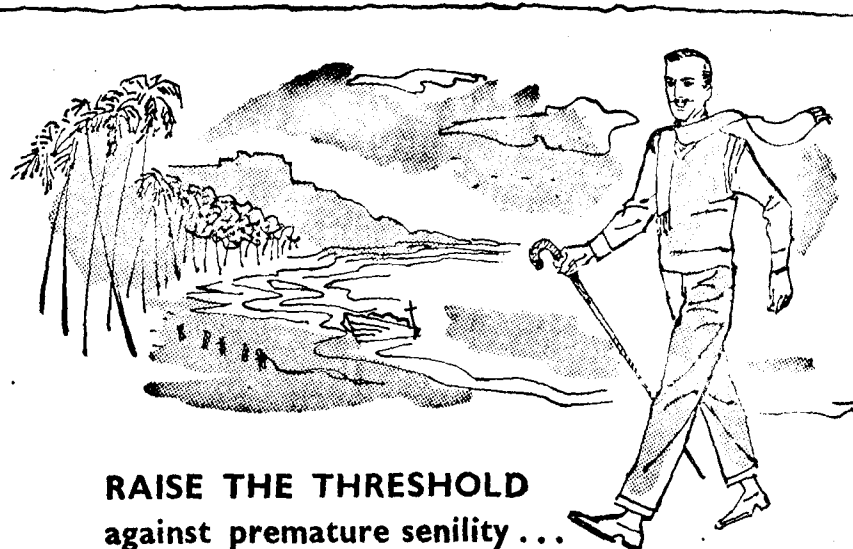
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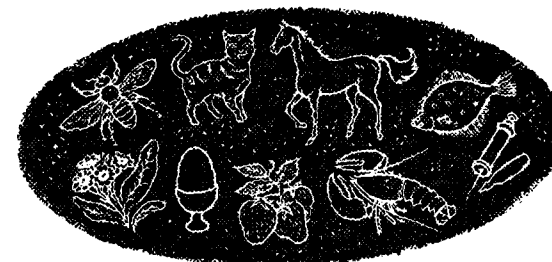
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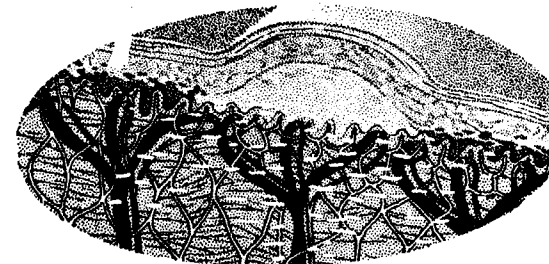
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Diez Rivas, F. et al: *Ann. Intern. Med.* 36. 1076. 1952.
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Dosage Schedule:
Threadworms and whipworms:— 1 tablet (or ¼ teaspoonful) per year of age per day up to the age of 6 years. Over 6 years of age 2 tablets (or 1 teaspoonful) three times a day. The dosage should be given from 3 to 7 days.
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worms: 2 ¼ tablets (or 1 ¼ teaspoonfuls) per year of age up to the age of 6 years. For adults and children over 6 years, give a total dosage of 15 tablets (or 7 ¼ teaspoonfuls). The dosage should be given in a single dose or in four divided amounts during one day.

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DOCTORS, DIET AND DALDA

A BUSY PRACTITIONER is often faced with the problem not only of curing his patients' ailments, but of advising them how to prevent the occurrence of such diseases. With the development of modern social medicine, the emphasis is being shifted from cure to prevention. The most effective way of preventing diseases—whether infective, deficiency or degenerative—is to maintain a well-nourished body, which alone means positive health.

A balanced diet is one which supplies enough energy for the type of life that a man leads and protects him from the various deficiencies and inadequacies of the dietary essentials. It should include adequate quantities of proteins, fats, carbohydrates, minerals, vitamins and water.

The recommended nutritional minimum of oil and fat consumption in India, according to the Nutrition Advisory Committee of the Indian Council of Medical Research, is two ounces per head per day, while what is actually available is only half an ounce. Fats, like butter and ghee, are good, but their supply is far short of requirements, and they are too expensive for the everyday use of most people. Our President, Dr. Rajendra Prasad, in one of his speeches, remarked: "Improvement in the milk field is a tremendous task, and is bound to be a slow process." Further, milk consumed as such is better than its products, like ghee and butter, because it provides, in addition to fat, animal protein as well as calcium and vitamins.

According to the most authoritative scientific evidence available from research studies in Europe and the USA, the energy and food value of hydrogenated oils as used in "shortening" and vanaspati are the same as those of the original oil from which they are prepared and, as a source of fat, as good as ghee or butter fat. H. J. Deuel of the University of Southern California has shown that with regard to the promotion of growth, fertility, lactation, and in general nutritive value, hydrogenated oils used in margarines and vanaspati are equal to natural oils and butter fat, and in certain directions, they are even superior. Dr. Aykroyd, the former Director of the Nutrition Research Laboratories, Coonoor, remarked: "Vanaspati is a wholesome food, and there is no objection from the nutritional standpoint to an increase in its consumption." This is in line with

the opinion of the US Council on Foods and Nutrition.

Fat is included in our diet, not only because of its energy value, but also because it acts as a carrier for the valuable fat-soluble Vitamins A and D. According to Health Bulletin No. 23 (1951), issued by the Nutrition Research Laboratories, Coonoor, Vitamin A deficiency is the major factor responsible for a large number of nutritional deficiency diseases.

DALDA Vanaspati is a cooking fat made from pure vegetable oils according to strict Government specifications, and enriched with 700 I.U. of Vitamin A per ounce and 56 I.U. of Vitamin D per ounce. Dr. Aykroyd has said, "If we compare ghee as actually sold and consumed with vanaspati in respect of Vitamin A content, it cannot be claimed that such ghee has any remarkable advantage over vanaspati." Besides, bazaar ghee when used for frying loses its Vitamin A more than vanaspati does. The Council of Scientific and Industrial Research, New Delhi, reports in its Literature Review on Oils and Fats 1955, "De and Kshirsagar observed that during cooking of vanaspati 8 to 50 per cent. Vitamin A is lost. The presence of moisture reduces this loss. Ghee lost 74 per cent. of Vitamin A during frying."

Vanaspati has a higher calorific value than butter, since the latter contains varying amounts of water in addition to the fat. Each ounce of DALDA yields 250 calories—over twice as much as an ounce of wheat or rice. In addition to being a fat enriched with two essential vitamins, DALDA is easily digested and utilised by the body on account of its low melting point. In the USA, H. J. Deuel has found that margarine fat and "shortening" composed entirely of hydrogenated oils are absorbed to the same extent as butter fat and lard. Langworthy in the USA has proved that digestibility coefficients of vegetable oils hardened up to a melting point as high as 45° are as good as those of butter fat and liquid vegetable oils.

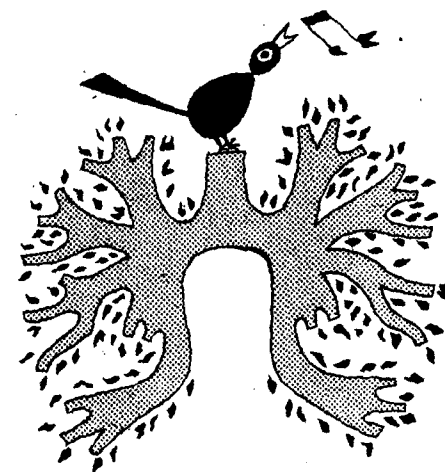
To sum up: DALDA is hygienically prepared and yet palatable, highly nutritive and yet reasonably priced, and therefore it makes a valuable contribution to the middle class diet which is so often lacking in such essential nutrients as fats and vitamins.

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prevents further insult...

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Meonine, 1-3 tablets twice daily (1-3 Gm.), supplies the same amount of methionine as 1-3 quarts of milk. Best results are noted when given with a high protein diet enriched with the vitamin B complex.

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Meonine has been successfully prescribed in cases characterised by low serum protein, jaundice, ascites, hepatic enlargement, or other signs of liver injury.

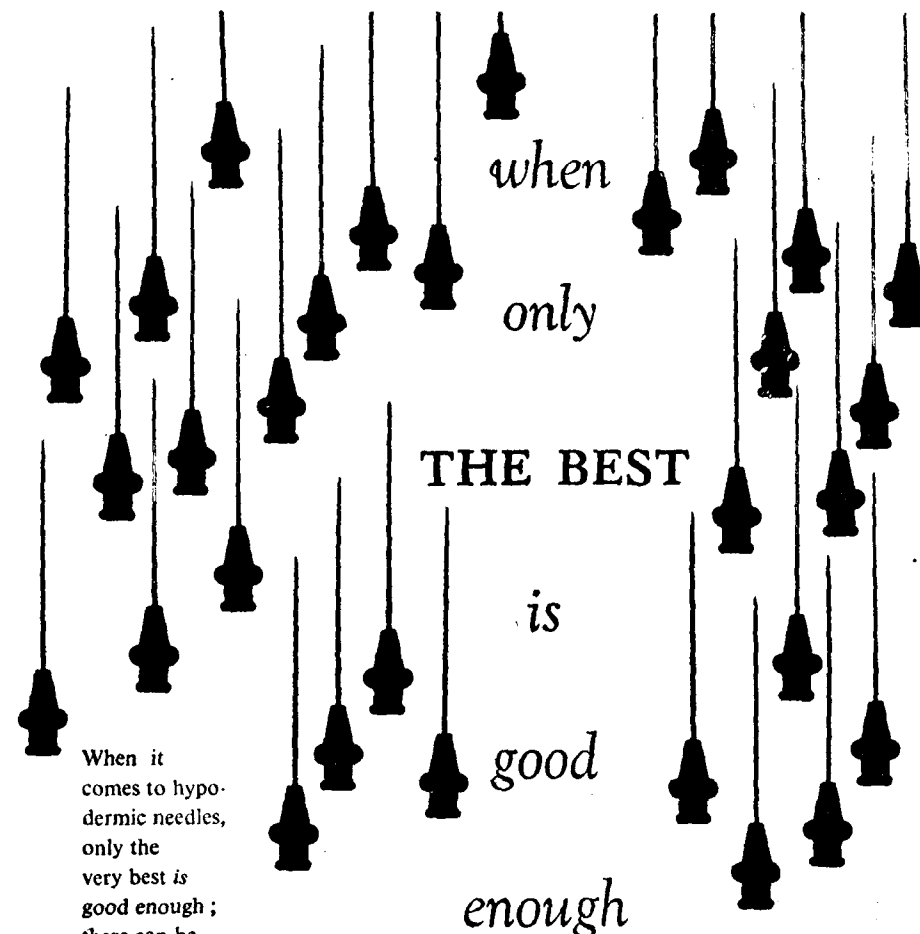
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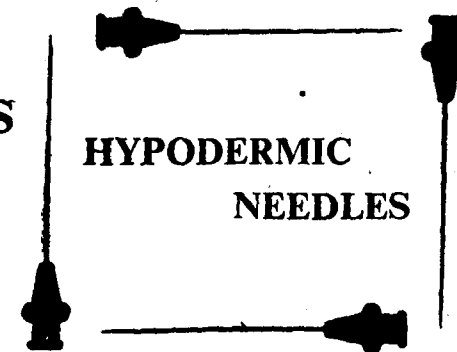
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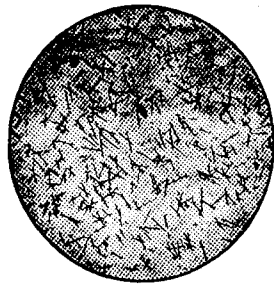
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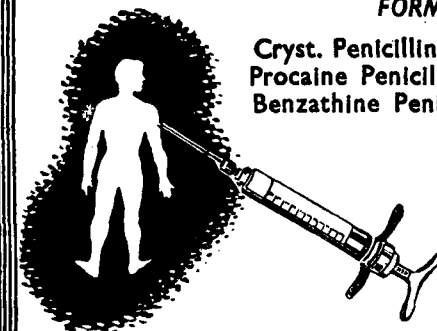
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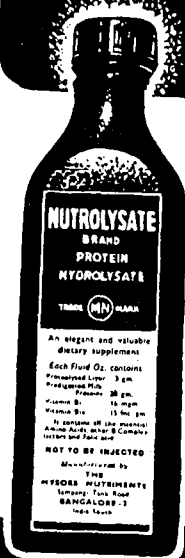
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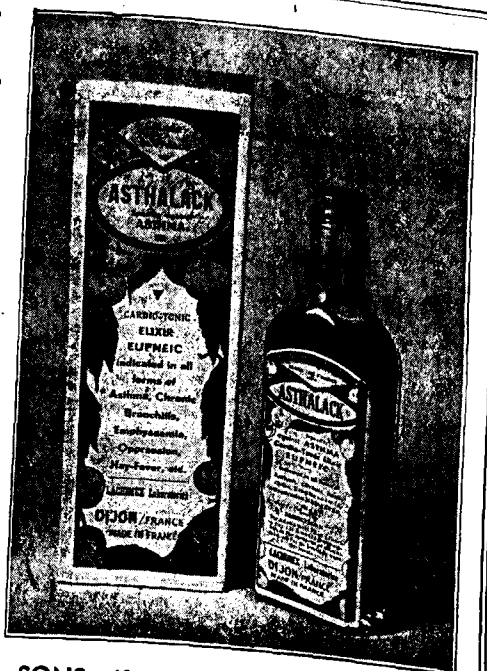
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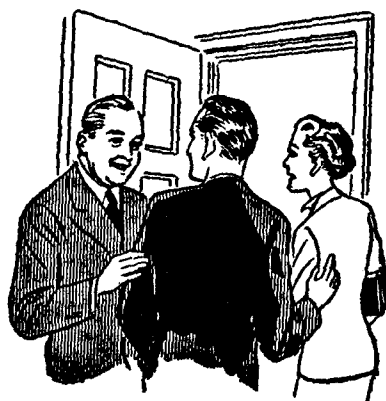


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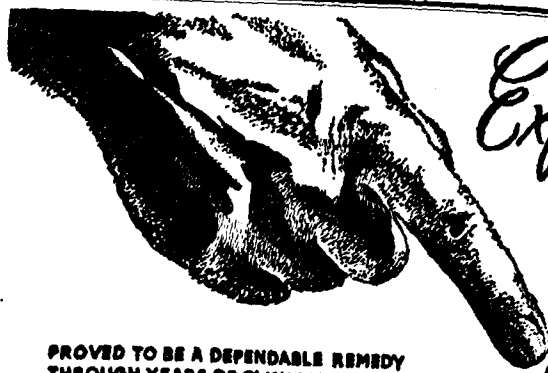
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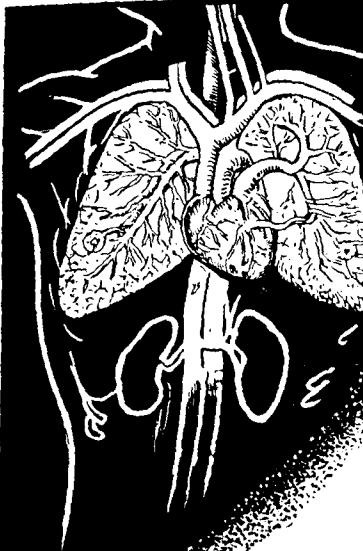
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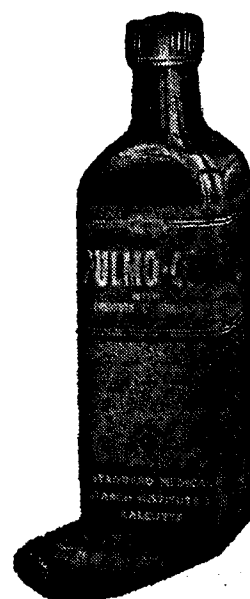
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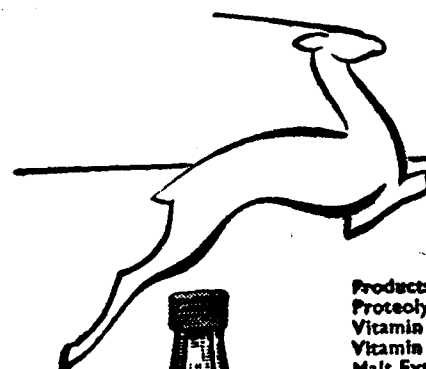
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Calcium Hypophosphite	150 mg.
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Syrup of Wild Cherry	1.5 c.c.
Tincture Gentian Co.	0.75 c.c.
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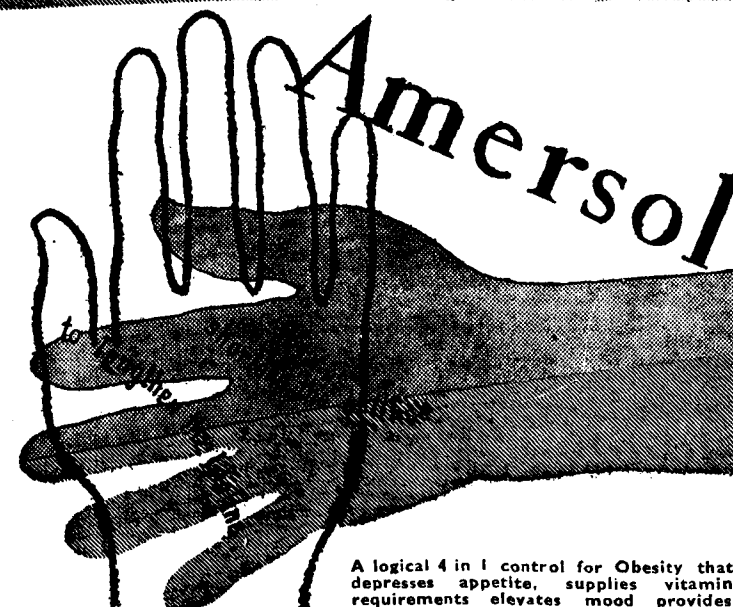
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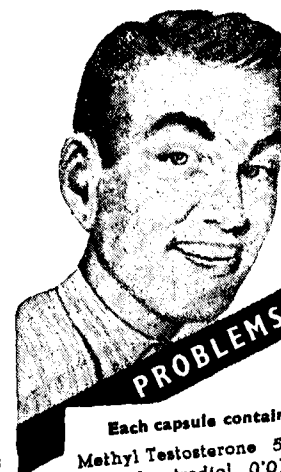
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DOSE : 1 to 2 capsules a day or as directed by Physician.

PRESENTATION : Bottle of 30 Capsules.

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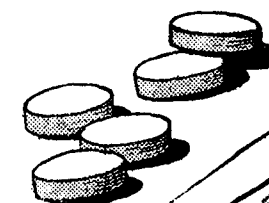
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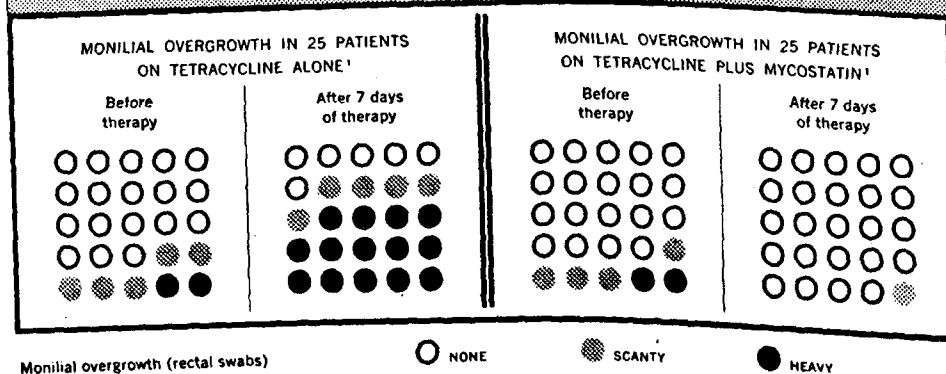
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1. Childs, A. J.: British M. J. 1:660 (March) 1956.

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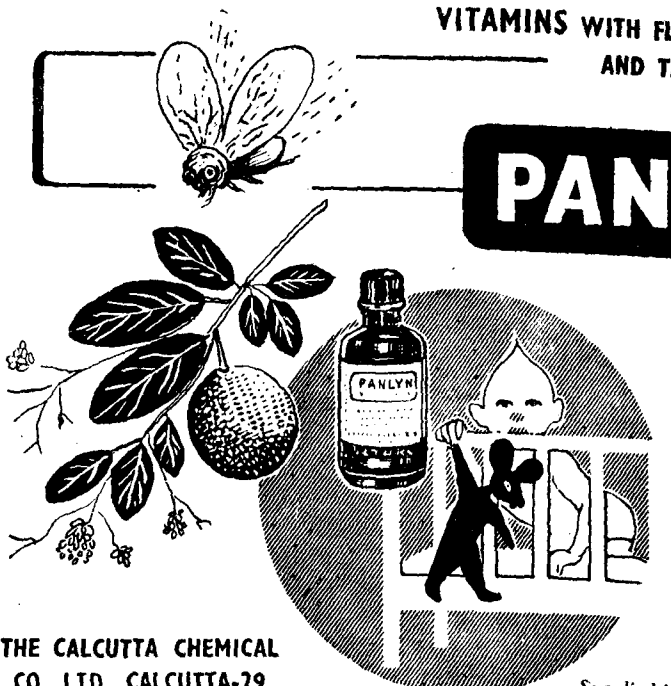
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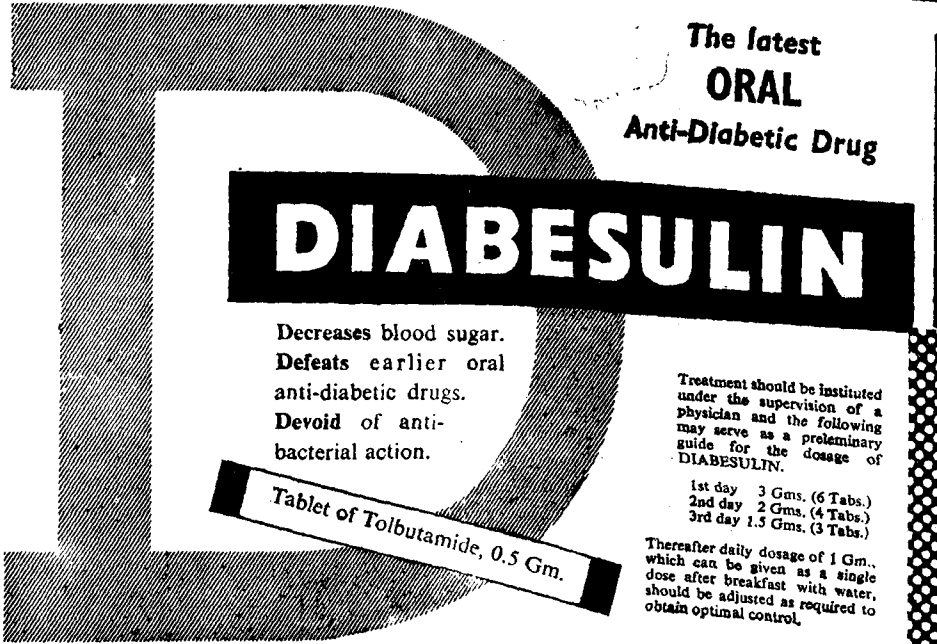
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Vol. 55

MARCH, 1958

No. 3

Original Articles

THE CLINICAL SIGNIFICANCE OF BLOOD-SUGAR*

PRATUL GOSWAMI, M.B., B.S.,

Department of Biochemistry, Assam Medical College, Dibrugarh

DERSEN and CULLEN (1775) were the first to note the presence of sugar in the blood. In 1831 Tiedemann and Gmelin showed the presence of sugar in the blood by using the method of fermentation. Fririch improved the method of detecting sugar in the blood; he used the Tremmer's reduction test and found a positive result in a sample of blood collected from the jugular vein; later Magendie (1847) got also a positive reduction in a specimen of blood collected from the hepatic vein. Till then the presence of sugar in the general circulation had not been demonstrated but Figuier (1855) observed the presence of sugar in the general circulation; his finding was not however, accepted in the medical world, for when Claude Bernard failed to detect the presence of sugar in the general circulation, the finding of Figuier, a comparatively less well-known scientist was naturally deemed unreliable. Later Figuier's findings were confirmed by Tieffenbach, Bock and Hoffman, Abeles, Von Mering, Pavy and the Master Claude Bernard himself.

Chauveau (1856) using the Barreswill's reduction method for the identification of sugar in the blood observed that:—(1) Arterial and venous blood both contained sugar, the former is larger amount than the latter; (2) the sugar content of the blood was the same on both sides of the heart; (3) the lymph also contained sugar; and (4) the concentration of sugar in the blood had no relation to the diet but was constant and persisted even after prolonged starvation.

* Specially contributed to the ANTISEPTIC.

[161]

Bang (1913) in Germany and Benedict both published their reports on the utility and widespread application of blood-sugar estimations, simultaneously but independently. Blood-sugar determination has since assumed very great importance in clinical practice.

The normal blood-sugar level varies with the method employed. In addition to the sugar there are in the blood other reducing substances which give a higher value for the blood-sugar level than the actual amount of sugar present and these substances are also responsible for the different blood-sugar levels obtained for the same individual using different methods. The non-glucose reducing substances are termed as "Glucid X" (Fontes and Thivolle, 1929-1930). The amount of Glucid X in the determination of the blood-sugar level by the method of Folin and Wu is near about 20 mg. of glucose per 100 cc. of blood and hence if the blood-sugar level is 80 mg. per 100 cc. of blood the true glucose per cent present in the blood comes to 60 mg. Best termed these non-glucose reducing substances as "residual reduction" and found that the blood-sugar level in the fasting human-being varied between 47 and 82 mg.% and 19 to 31 mg.% of glucose is due to those "residual reduction" which are not fermented by the pure yeast culture. He has noted that the non-glucose reducing substances amounted to between 10 and 30 mg.% of sugar in the usual routine methods for the determination of blood-sugar. In the Benedict's modification of Lewis and Benedict's method there is another factor called "Y-reduction," which ranges from 14 to 68 mg. with an average of 40.4 mg. p.c. (Pickard) and hence the value of blood-sugar determined by this method is naturally higher than that determined by the Folin and Wu method. This "Glucid X" factor is normal in nephritic cases (Pickard, Pierce, Marsden, Tanaka and Townsend, 1932) but the "Y reduction" is increased in the nephritic cases (Pickard and Godwin). In severe cases of diabetes with persistent high blood-sugar level both the "Glucid X" and "Y reduction" are increased (Somogy and Krammer (1928), Pickard and Godwin) but in moderate diabetes the "Glucid X" may be normal (Folin and Svedberg (1929), and Pickard and Godwin). Out of the many non-sugar reducing substances, the glutathione is the most important one and it raises the blood-sugar level by 10 to 20 mg. p.c. in Folin and Wu method (Benedict and Newton, 1928-'29) and this glutathione of the R.B.C. is responsible for the "Y-reduction" (Pickard, 1932). But the validity of this statement is later questioned by Benedict himself and also by Fashena (1933) as they believed that the power of reduction being low the glutathione may raise the true blood-sugar level by 1 to 2 mg. p.c. to give the *apparent* blood-sugar level. The normal amount of glutathione in the

blood determined by the method of Somogyi is about 30 to 50 mg. per 100 cc. (Menon and Rao, 1934-'35). In the Folin and Wu method the "Glucid X" factor is the lowest one, and hence the blood-sugar determined by this method is correct for all clinical purposes.

In addition to these non-glucose reducing substances, the blood-sugar level may vary according to the source from which the blood is collected. The sugar content of blood in the capillaries and arteries is identical (Foste) but the arteriovenous difference in glucose content in blood is found to vary from about 1.5 to 8 mg. p.c. in the post-absorptive stage (Somogyi) but the difference is increased after the administration of glucose when the blood-sugar level is raised or after the administration of insulin and the difference becomes less in such conditions where the power of utilization of the carbohydrate is decreased as in diabetes.

The variation of blood-sugar depends mainly upon the extent of intestinal absorption and hence after a meal when the power of absorption is increased the blood-sugar level is raised and the value of blood-sugar level is minimum on the empty stomach, *i.e.* in the post-absorptive stage.

The normal value of fasting blood-sugar determined by the Folin and Wu method is 80 to 120 mg. per 100 cc. of blood. For the Indian this value may not be corroborating and Kumar *et al* estimated the fasting blood-sugar level among Punjabi young men and found it to be 70 to 100 mg. per 100 cc. of blood when the blood was collected from the vein and the value for G.S.H. was between 22.30 mg. and to 51.28 mg.%. The mean value for fasting blood-sugar level according to them is $85.55 = 7.78$ mg.%. The value for blood-sugar and also for G.S.H. are below European standards. (Normal value for blood G.S.H. between 35 and 45 mg. (Tunncliffe); and 32 and 52 mg. (Arnovljevitich, 1931 determined by the Tunncliffe method). Brahmachari *et al* also determined the blood-sugar level by Maclean's volumetric method among young Bengali medical students. Their observations showed that: (1) the fasting blood-sugar level ranged between 0.075% to 0.135% after 10 hours' starvation; (2) the original level was reached after 1½ hours in 29 of the 47 students, after 2 hours in 12 and 10.0% were found to be practically diabetic; (3) the renal threshold value in these young healthy Bengali students was $\frac{0.182 - 0.169}{2} = 0.175\%$.

The criteria for the ideal normal G.T. curve according to Tallerman (1923) are:—(a) The fasting blood-sugar should not exceed 0.135% nor show a rise of 30 mg. above the initial fasting level; (b) the raised blood-sugar level should come to normal

after 1½ to 2 hours and should not persist at the raised level beyond that period.

In the regulation of blood-sugar levels, the liver plays the most important part:—(a) the glycogen stored in the liver is converted to glucose whenever the blood-sugar level tends to fall down, thus enabling an almost constant level to be maintained. As the blood-glucose level rises, the output of glucose by the liver is decreased (Soskin *et al.*). Muscle glycogen can be converted to glucose in some abnormal conditions through the lactic acid cycle; (b) when the body is deprived of carbohydrates the liver forms glucose from other sources, like protein and fats by the process of neoglucogenesis and thus the supply of sugar to the well conserved.

The part played by the kidneys is almost negligible though it has been shown that the kidneys are able to form glucose from the intermediary product of carbohydrate metabolism and also from the amino-acids; but the capacity of the kidneys in glucogenesis is very small.

In addition to the pathological lesions in these organs, other physiological factors have also to be considered in explaining variations in the blood-sugar; some of them are:—

(1) *Age*:—The blood-sugar level in infancy is slightly higher and on an average has been found to be 117 mg. per 100 cc. of blood (Lindberg); after 12 hours of fasting the level comes down to 94 mg. p.c.; after 24 hours of fasting the blood-sugar level goes further down to 74 mg. p.c. and remains at the level for a fasting period of 28 to 60 hours. Brown observed that the blood-sugar level is slightly below the normal for an adult during the first two weeks of life. Allen observed the higher value for the infant; but Punschel and Spence found that in old age there was a tendency for a higher blood-sugar level with a low sugar tolerance test.

(2) *Race and sex*:—Race and sex do not ordinarily play any part in causing varieties in the blood-sugar levels but a higher blood-sugar level is observed in women during menstruation (Allen); perhaps the increase is due to the endocrinal disturbances that occur during that period; but during pregnancy hyperglycæmia is not an uncommon finding (Schi Rokhuer).

The normal blood-sugar level in the Indian is slightly lower than that in the average European. Recently Banerjee and Laskar however, found a higher value.

(3) *Altitude and climate*:—The blood-sugar level is raised and tends to reach a hyperglycæmic state at sea level (Hall and Warefie), while at higher altitudes and in colder climates the blood-sugar level in the same individual is definitely lowered. Increased temperature raises the blood-sugar level but not

sufficiently high to cause glycosuria (Senator). By applying external heat to raise the body temperature even upto 41°C the alteration of blood-sugar is insignificant (Lepine and Boulud).

(4) *Emotion and shock*:—Emotion and shock greatly affect the blood-sugar level (Boehm and Hoffman 1878). It has been observed experimentally that fright caused hyperglycæmia (Cannon, Shoht and Wright) and also the stimulation of the crural, sciatic, and vagus nerves raised the blood-sugar level. The stimulation of these nerves and also emotions and shock produces an excessive amount of secretion of adrenaline and so the blood-sugar level is raised.

(5) *Exercise*:—During strenuous exercise, carbohydrate utilization is increased several-fold and so for an hour and a half after such strenuous exercise the hyperglycæmic state due to the ingestion of carbohydrate is decreased (Staub 1922) but if the exercise is done before the intake of the carbohydrate the hyperglycæmia tends to increase. It has been observed that after a brisk one-mile walk early in the morning, the blood-sugar level goes upto 145 mg. per 100 cc. (Hale and White and Paying). Blood-sugar in runners who have just completed a run in the Marathon race is below normal range (Burgess and Derick) most probably due to the fact that the runners take glucose just before starting in the race; and another possible explanation is based on the observation of Rakestraw, who found that short and severe exercise tends to increase the fasting blood-sugar levels while prolonged exercise lowers the blood-sugar level.

(6) *Diet*:—The type of diet taken previous to the determination of the blood-sugar level may alter the type of the G.T. curve (Sweeney) and it has been observed that the individual on carbohydrate alone for 48 hours before the actual test shows a low curve; but if the same individual is given a diet exclusively of protein, a higher and sustained curve is obtained. It is not that there is a greater secretion of insulin when an exclusively carbohydrate diet is given, though such a belief was formerly held. The liver in such cases actually decreases the output of blood-sugar.

The part played by the endocrine system in the regulation of the blood-sugar is a well-known fact. The normal level of the blood-sugar is maintained due to the equilibrium between the rate of sugar formation and the rate of sugar utilization in the tissues (Claude Bernard). Whether the liver inhabits the formation of blood-sugar or accelerates the rate of formation of the blood-sugar depends upon the balance action of the endocrine secretion; the deficiency of insulin causes hyperglycæmia just opposite to the action of the anterior pituitary. If the secretion of the anterior pituitary is less (*i.e.*, hypopituitarism) the individual will suffer from hypoglycæmia; but if the individual suffers from

hyperpituitarism there will be hyperglycæmia. The adrenal cortex and the thyroid also behave more or less in the same way as the anterior pituitary and hence the liver fails either to inhibit or stimulate the formation of blood-sugar irrespective of whether the blood-glucose level is in a hyper or a hypo-condition.

Considering all the physiological factors, Variyar (1948) formulates a general formula for both male and female for the determination of the blood-sugar level :—

$$Y = -14.120 + 70.500 x_1 + 0.841 x_2 \text{ (For male)}$$

$$Y = +45.443 + 15.456 x_1 + 0.696 x_2 \text{ (For female)}$$

Where

Y = Fasting blood-sugar is mg. per cent.

X₁ = Body surface area in Sq. metres.

X₂ = Age in years.

The co-efficient 15.456 + 0.696 and not significant at the usual 5 per cent level (Fisher).

"t" values are 0.999 + 0.964 (Fisher).

There is considerable variation in different individuals but even then "the fasting blood-glucose values so calculated could be exceeded by the actual test" by mere chance.

The disorder of any of these physiological factors in the regulation of the blood-sugar level may show an abnormal result and an abnormal behaviour of the G.T. test. Ohler studied 160 cases of different diseases and found that in 103 of them there was no glucosuria at all and in the remaining 57 cases there was trace of sugar present in the urine. Out of these 103 cases 60% included gall-bladder diseases, cirrhosis of liver, bronchial asthma, arteriosclerosis, carcinoma, obesity, endocrine disturbances, chronic nephritis, chronic arthritis with abnormal sugar-tolerance test. Gray also studied the glucose-tolerance test in different abnormal conditions in groups and his findings were as shown in Table I, see p. 167.

Hughes and Malik using the method of Mclean determined the blood-sugar level in 49 persons suffering from different diseases like chronic amoebiasis, bacillary dysentery, atrophic cirrhosis of the liver, ankylostomiasis, sciatica, polyarthritis, gonococcal neuralgia, tuberculosis, pleurisy, facial paralysis, tabes mesenterica, tubercular enteritis, pulmonary tuberculosis, chronic malaria, chronic nephritis, myeloid-leukæmia, idiopathic oedema, epilepsy, enteric fever, renal colic, chronic myocarditis, irregularity of the heart-rate, trauma of the chest and observed an abnormal G.T. curve—the reasons attributed being :—(1) defective storage in the liver ; (2) defective circulation in the muscles (Pemberton, Cajori and Crouter 1926) ; (3) abnormal nervous influences ; and (4) a predominantly vegetarian diet.

TABLE I
Showing the Blood-sugar level in conditions neither normal nor diabetes mellitus

Condition	No. of cases	Blood-sugar, average per cent.				
		Fasting	½ hour	1 hour	2 hours	3 hours
Hypertension with nephritis	29	0.11	0.19	0.18	0.16	0.13
Nephritis without hypertension	11	0.14	0.19	0.23	0.20	0.24
Renal glycosuria without nephritis	70	0.09	0.13	0.12	0.11	0.09
Pregnancy with blood sugar 0.11% or less	51	0.09	0.14	0.14	0.12	0.13
Hypothyroidism, cretinism, myxoedema	8	0.10	0.16	0.15	0.12	0.11
Hyperthyroidism with fasting blood sugar 0.12 or more	9	0.13	0.17	0.18	0.18	0.11
Hyperthyroidism with fasting blood sugar 0.11 or less	58	0.09	0.16	0.16	0.14	0.11
After operation	4	0.08	0.12	0.12	0.09	0.09
Hepatic diseases (a) obstructive jaundice	7	0.13	—	0.22	0.23	—
(b) Cardiac cirrhosis	6	0.14	—	0.18	0.21	—
(c) Alcoholic or syphilitic cirrhosis	28	0.10	0.15	0.17	0.17	0.18
(d) Catarrhal jaundice	10	0.10	—	0.15	—	—
Bailey's case	1	0.12	0.32	0.37	0.34	0.27
Hypopituitarism or dyspituitarism	4	0.11	0.17	0.17	0.14	0.12
Acromegaly or hyperpituitarism	11	0.09	0.13	0.17	0.15	0.11

(After Gray)

As the liver is the major factor in the determination of the type of the G.T. curve let us turn to the conditions where the liver is affected. As G.T. test is one of the liver function tests it is expected that in conditions where the liver is affected and damaged partially or totally, the behaviour of the G.T. test will also be different from the normal one. Peters and Van Slyke have also noted an "excessive alimentary hyperglycæmia" in diseases of the gall-bladder and other pathological conditions of the liver. Pezzali has so far been convinced that he does not hesitate to recommend this test as an aid in the diagnosis of

liver diseases, but the usefulness of the G.T. test is doubtful specially when the findings of different workers vary. Lichtman has definitely stated that the G.T. test has no specific diagnostic value; Hetenyl quoted by the same author, has given more diagnostic importance to the hyperglycæmic patient which is the proportion between a single blood-sugar value fifty minutes after the ingestion of glucose and the fasting value.

The level of blood-sugar in cirrhosis of the liver is a debatable question, as Hegler got a value above the maximum normal but Rao (1934) found the fasting blood-sugar level to be "much below the lower limit of the normal." Chauffard, Brodia and Zizine (1921) and also Rathery and Froment (1926) found an increased fasting blood-sugar level in cirrhosis but Tamalet (1926), Bossi (1927) and Puxeddu (1927) noted normal values for fasting blood-sugar levels. The explanation for Hegler's finding a higher value might be that (1) all his cases were clearly people whose blood-sugar levels were higher than the normal adult, (2) or more probably his cases were all latent diabetics. The level of the blood-sugar also depends upon the stage at which the blood is collected for study. The non-glucose reducing substances are not at all responsible for the higher values, as the "Glucid X" and "Y-reduction" are both the same in cirrhotic and in normal people (Menon and Rao, 1934). In cirrhosis of the liver the functions of the liver are impaired. The impairment of the liver functions might lie: (i) in defective storage of glucose after absorption from the intestine; (ii) defective conversion of the liver glycogen to blood sugar; (iii) defect both in the storage and in the conversion, or (iv) partial or total failure of the formation of glucose from sources other than carbohydrates; if this were so, the blood-sugar level in cirrhosis of the liver is expected to be lower than normal.

In some other diseases like kala-azar, malaria etc. where the liver is damaged to some extent, the level of blood-sugar is stated to vary according to different authors. In Leishmaniasis there is hyperglycæmia (Auricchio) and there might even be associated glycosuria (Greig and Kundu) but others (Banerjee and Saha, 1924-'25) got a low value for the blood-sugar level. The case of kala-azar reported by Greig and Kundu with hyperglycæmia and glycosuria (blood-sugar 0.461% and sugar in the urine 38.4 grains per oz.) may not have been a simple case of kala-azar alone as the hyperglycæmia and glycosuria were controlled by insulin. Had it been a simple case, the hyperglycæmia and glycosuria would have been controlled by the administration of the specific drugs for kala-azar. The reason attributed for the hyperglycæmia and glycosuria, is the sudden damage of the beta-cells of the Langerhans and to prevent

further damage of the beta-cells the patient was put under a regime of insulin. If the destruction of the beta-cells was due to L.D. bodies as explained by the authors the further damage would have been better controlled by the administration of anti-kala-azar drugs like urea-stibamine etc., that would have destroyed the L.D. bodies. Brahmachari quoted by the same authors claimed to have seen two more cases of kala-azar with glycosuria but did not furnish details of the two cases.

Harrison (1921), Castellani and Willmore (1924) recorded glycosuria of malarial origin and the glycosuria was controlled by the anti-malarial drugs. This type of glycosuria may precipitate true diabetes at any time.

In infective hepatitis and acute yellow atrophy of the liver there is hypoglycæmia due to the impaired function of the liver in storing glycogen and in such cases the G.T. curve becomes a typical one with a low fasting blood-sugar level but later on assumes the nature of a true diabetic curve.

In Von-Gierke's disease on the other hand, there is abundant storage of the liver glycogen leading to hypoglycæmia and ketosis and such patients are extremely sensitive to insulin.

In eclampsia and in normal pregnancy where the liver undergoes much strain the blood-sugar level is found to be raised. In the first month of pregnancy the raised blood-sugar level is that of the renal type (Schirokauer); Peters and Van-Sylke got a normal blood-sugar level in common toxæmias of pregnancy and also in normal pregnancy; but Killian and Sherwin quoted by Peters and Van-Slyke got a high blood-sugar level in 2 out of 5 cases of normal pregnancy. In Gray's series of 51 cases of pregnancy the blood-sugar level remained at a higher level than the fasting one even after 3 hours.

In uncomplicated heart diseases the blood-sugar level is expected to be a normal one. The high blood-sugar level in such cases might be due to: (a) advancing age of the patient or (b) latent associated diabetes mellitus. In the latter case the blood sugar is to be controlled by insulin or with restricted diet at a higher level than the usual one; otherwise considerable risk from angina pectoris, coronary thrombosis etc., may occur at any time (Strouse, Seskin, Katz Rubin). In a case of diabetes mellitus with associated heart complications a liberal carbohydrate diet is advocated (Smith, Gibson, Ross) in order to avoid the above hazards. In such cases a mild hypoglycæmia may lead to "weakness, attack of anginal pain, peripheral or cerebral thrombosis or even coronary occlusion with sudden death (West). The blood-sugar in such patients is to be maintained with the general formula:—Age of the patient + 100 = mg. of glucose per 100 cc. of blood.

The next important factor that may cause disorder of the blood-sugar level is the endocrinal disorder. In fact hyperglycæmia and glycosuria are more often met in the disorder of the endocrinal system than in any other condition and the clinicians give more significance to the blood-sugar level than any other conditions. Diabetes mellitus is the most common pathological condition of all hyperglycæmic and glycosuric conditions which have already been discussed. A detailed discussion of diabetes mellitus is beyond the scope of this paper. In diabetes the pancreas does not secrete insulin, resulting in non-utilization of the blood-sugar by the tissues and also in non-formation of liver glycogen. The blood-sugar level goes up. The highest value of blood-sugar level so far recorded in non-fatal diabetic coma is 1850 mg. per 100 cc. of blood (Dillen and Dyer) and in a fatal case it is 2060 mg.% (Lawrence). The plasma contains a higher amount of sugar than the whole blood (Hogler and Ueberrack); even then "no serious error is involved in the use of whole blood for analysis" (Folin and Berglund). This is true both for diabetic and non-diabetic people. The action of insulin over the erythrocytes in lowering the blood-sugar value does not tally with the lowering of the blood-sugar in the whole blood (Foshay); but Trimble and Maddick do not agree with it. Hyperglycæmia is a condition where there is "an increase of the total amount of the blood-sugar over the normal and not merely an increase in the concentration or percentage" (Epstein), and hence the determination of the blood-volume is essential, in diabetes (Epstein and Baehr) especially in a case of diabetic coma where there is hæmoconcentration (Peters *et al*, Chang and Harrop and Schaub) and hence a simple determination of the blood-sugar percentage does not give a true picture of the total blood-sugar in such conditions. The determination of the blood-sugar level in an untreated case of diabetes mellitus and in diabetic coma is of less significance than the determination of the blood lipids in such cases but in the cases treated with insulin the severity is better understood by the determination of the blood sugar as insulin lowers the blood lipids markedly. In diabetes mellitus the glucose is removed at a much slower rate and also the utilization of the glucose by the tissues greatly inhibited but the total amount of glucose that is poured into the tissues is not reduced at all.

The next common disorder of the endocrinal system is thyrotoxicosis. In thyrotoxicosis and hyperthyroidism there is increased B.M.R. leading to a rapid absorption of the carbohydrate and the blood-sugar level is thus raised to a higher level. The fasting blood-sugar level might also be normal in such cases but the blood-sugar level is raised to a considerable extent after the ingestion of the glucose and the raised level of

blood-sugar sustains for a longer period. In hypothyroidism on the other hand, the fasting blood-sugar is either normal or below the normal level. Administration of thyroid extract causes a high blood-sugar level. Hugh and Maclean (1932) reported a case of glycosuria with marked disturbance of sugar tolerance and on enquiry the patient admitted that "to feel young and rejuvenate" he was taking thyroid extract 2 to 3 tablets daily; when the thyroid extract was stopped the glycosuria and hyperglycæmia disappeared.

In other rare conditions like acromegaly the blood-sugar level is raised giving a perfect picture of a mild or severe diabetes mellitus and may even lead to ketosis and coma. It is not necessary that all the cases of acromegaly should show a high blood-sugar level, especially cases of acromegaly in the hypopituitary state when the blood-sugar level is much below normal. Berg reported 6 cases of acromegaly without hyperglycæmia or glycosuria and he then administered 0.067 units of insulin per kilogram of body-weight and observed that in 3 out of these 6 cases the blood-sugar level came down to 40 to 60 mg. after 20 minutes but in the rest 3 there was no alteration in the blood-sugar level even after the administration of a higher dose. The injection of the plasma of an acromegalic patient to a rabbit caused hyperglycæmia (Elmer, Giedosz and Scheps). There are different theories regarding the hyperglycæmia and glycosuria in acromegaly but the most convincing one is that is normal and also in the early stages of acromegaly the diabetogenic and pancreatotrophic hormones are in equilibrium but in the later stage of acromegaly due to constant and over-stimulation the pancreatotrophic hormone is not secreted causing hyperglycæmia and glycosuria.

In hypopituitarism there is usually hypoglycæmia with a flat sugar curve after a test meal (Cushing, 1912) but cases of hypopituitarism are on record with as high as 434 mg. of sugar per 100 cc. of blood (Beck and Buter, 1937); Sexton and Neuhoff (1936) reported another case of pituitary dwarfism with a fasting blood-sugar level 182 mg. per cent.

In normal individuals epinephrine or adrenaline accelerates the break-down of liver glycogen to glucose and hence the administration of the adrenaline or epinephrine causes a rise in the blood-sugar level. The cortin is related to the formation and utilization of glucose and also regulates gluconeogenesis from the amino-acids in the liver and the administration of cortin also produces hyperglycæmia. In Addison's disease the secretion of adrenaline is inhibited or becomes *nil* and hence the fasting blood-sugar level is below the normal level.

In the metabolism of carbohydrate and also in the regulation of the blood-sugar level the part played by the kidney is almost

negligible and hence in the lesions of the kidneys it is expected that the blood-sugar level will not be much disturbed and in actual practice it has been found that in subacute nephritis the blood-sugar level is normal but in chronic nephritis the blood-sugar level is raised with or without hypertension (*vide* Gray's Table on p. 167). Hyperglycæmia is not associated with glycosuria. The cachetic nephritic cases without hypertension show a tendency for hypoglycæmia (Lepine) but the blood-sugar level with hypertension in such cases is found to be a high one. Stiling did not get hyperglycæmia stage in his investigation. In nephritis the non-glucose reducing substances are increased but this is not the whole explanation for a high blood-sugar value.

In mental disorders like schizophrenia, general paralysis, subdural hæmorrhage, and puncture of the 4th ventricle, the glucose tolerance curve is found to be an abnormal one. That abnormality might be either in the hyperglycæmic or in the hypoglycæmic state. The varying findings of the G.T. curve in the same individual at different stages depends upon the emotional stress or a quiet and calm mood. The hyperglycæmic index = $\frac{\text{two hours sugar level} - \text{fasting sugar}}{\text{maximum sugar level} - \text{fasting sugar}}$ during emotional train is high, but low in calm and quiet conditions (Mc Cowan and Quastel); but it has been observed that "there are not as yet, however, sufficient data to determine whether the psychoneuromatic individual will exhibit a significantly different glucose curve when subjected to the same or similar emotional stress as a normal individual." In encephalitis the blood-sugar level is often increased (Thalhimer and Updegraff, Cohen) due to some damage in the hypothalamic region. In brain tumours and apoplexy whether the lesion is capsular, meningeal or even cortical the blood-sugar level is found to be often raised.

In some of the infections there may be high blood-sugar level with glycosuria, the common examples of such infections being furunculosis and carbuncles. In pulmonary tuberculosis the fasting blood-sugar level is often higher than normals and the G.T. curve resembles that of alimentary G.T. curve. In pneumonia the blood-sugar level may be raised but not to a very considerable extent and there is no glycosuria. In diphtheria there might be reduced carbohydrates tolerance (Elkeles and Heimann). Hyperglycæmia is produced by the administration of killed suspensions of *B. coli*, *B. proteus vulgaris*, *B. paratyphosus* but not with *Streptococci hæmolyticus*, *Streptococci viridans*, *Staphylo-aureus*, *B. pyocyaneus* and *Bacillus typhosus*. Diabetes mellitus can be precipitated at any moment with cellulitis, gangrene, carbuncles or even common cold.

In arthritis the blood-sugar level is found to be abnormally high and remains at the higher level for a long period after glucose

feeding (Pemberton and Foste. It is suggested that any interference with the general circulation in the limbs causes hyperglycæmia and hence if the circulation can be maintained or can be restarted the blood-sugar level is expected to be normal. Helsti has observed that in arthritis cases where the infection and inflammation have been controlled, the blood-sugar level or the G.I. curve gets back to the original one.

In other conditions like Myasthenia gravis (Williams and Dyre, Payne and Hale-White), pernicious anæmia, syphilitic aortitis, non-endocrinal obesity (Gold-Blatt, Forrest Smith and Garainer 1928) the blood-sugar level is found to be at a higher level than the normal. In thiamine deficiency due to lack of thiamine-pyrophosphate, a co-enzyme to oxidize the pyruvic acid the blood-sugar level is raised and the G.T. curve is a sustained one at a higher level. In experimental animal the blood-sugar level is found to be raised after hæmorrhage (Robertson, 1935) and more so in a fed one (Long *et al*, 1943). The rise of blood-sugar is directly proportional to the loss of blood and in later stage of hæmorrhage the blood-sugar level may be in a hypoglycæmic state. In severe hæmorrhage there is a greater secretion of epinephrine which is most probably responsible for the higher value of the blood sugar.

The blood-sugar level is low in progressive muscular dystrophy (Mc Crudden and Sargent) and other well-known causes of spontaneous hypoglycæmia like the growth of the islet of the Langerhans, functional hyperinsulinism, diseases of the suprarenals, pluriglandular deficiency, carcinoma of the liver, acute yellow atrophy of the liver, muscular diseases or wasting, lowered renal threshold, lactation, hypoglycæmia in a nursing mother on a restricted diet of fat and vegetables, alimentary hypoglycæmia due to starvation etc. In starvation the blood-sugar level falls down after about 2 days of starvation and reaches the minimum level (50 mg. per cent or still less according to Lennex. (O'Connor, Bellinger, 1926) within 4 to 6 days but during the 2nd week of starvation the blood-sugar level rises approximately to the normal level due to a decreased secretion of insulin, thyroxine and "consequent decrease in the utilization of glucose, and increased adreno-cortical activity and consequent increased glucogenesis." Clinically the hypoglycæmia symptoms may be manifested in 3 different stages *viz.*:—(1) Premonitory stage when there is fatigue, "lassitude and reluctance to physical and mental effort," lowered B.P.; (2) when there is restoration of B.P., pallor, flushing, cold, clammy perspiration, palpitation of the heart, tremor of hands, sensation of hunger and thirst, and fear are the prominent subjective symptoms; and (3) when the senses become clouded, dull and confused, with indistinct speech, hallucination etc.

Hale and White (1927) attributed the diagnostic value of the G.T. test only in diabetes but different authors working on different diseases found abnormal behaviour of the G.T. curve. Friendenwald and Grove, later supported by others also, gave some importance to an excessive alimentary glycaemic reaction as an aid in the diagnosis of carcinoma of the stomach. The purpose of this paper is to turn the eyes of the clinician to the significance and importance of the determination of blood-sugar levels in different diseases and to see if the blood-sugar level is really of help in the diagnosis of the different conditions.

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HYPOTHERMIA IN THE MANAGEMENT OF THE POOR RISK PATIENT UNDERGOING MAJOR SURGERY

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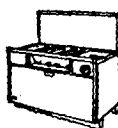
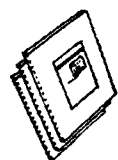
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ANKYLOSTOMIASIS*

(A Review)

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Introduction.—Ankylostomiasis is a very interesting clinical condition; a "symptom-complex" of hookworm disease produced by a small worm measuring about 10 to 14 mm. in length and 4 to 6 mm. in thickness. It lives in the small intestine of man. An infected person may carry the infection without having any symptoms; these are mild cases known as "carriers" of the disease. The disease affects rich and poor, males and females alike; all the members in a family may be infected. Children are more susceptible because of the thinness of their skin. There is some epidemiological evidence to show that a previous attack of hook-worm infection confers some degree of protection against re-infection. The disease may not progress in well-nourished individuals.

Man is the main reservoir of infection. The presence of one or more infected persons (carriers) in a locality is enough to cause an epidemic; for transmission takes place from man to man by faecal contamination under optimal conditions of temperature and humidity.

In chronic cases the disease manifests itself by a variety of symptoms like:—(1) gastro-intestinal derangement *e.g.*, gastric pain, anorexia etc.; (2) circulatory disturbances; and (3) nervous disturbances. The illness causes no pain nor fever but the victim becomes listless, lethargic and lazy and is disinclined to move about or engage in his normal activities with the result that his economic condition deteriorates. In chronic cases the progress of the disease is slow and insidious; the face shows a characteristic appearance known as "Hookworm-facies" in which the forehead, cheeks and nose appear pale and dry. The face on the whole is slightly puffy. Children suffer from stunted growth with mental retardation.

Abortion and impaired lactation have also been reported in pregnant mothers.

The loss of physical efficiency and sometimes also sterility are not uncommon in chronic cases.

The worm is reported to have been in existence in 1550 B.C., and was known to ancient Egypt under the name of Heltu as mentioned in the medical literature of Ebers Papyrus.

After its discovery in 1838–1843 by Dubini in Italy who named it as *Agchylostoma duodenalis*, the parasite was studied by various authors between 1845 and 1911 with regard to its

*Specially contributed to the ANTISEPTIC

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parasitology, epidemiology, pathogenesis, symptomatology, prevention and treatment.

Distribution.—Leiper discovered the wide distribution of *Necator americanus* in India.

Summons *et al* (1944) estimated that about 210 million people in undivided India suffered from the infection with a frequency varying from 40 to 70 or even 80%. The Rockefeller Commission estimated that there were about 9,00,000,000 cases in the world.

Hookworm disease is widespread in India being found in the tea gardens of Assam; in Bengal; in the tea and coffee estates of Coorg; in Travancore and South Kanara; also moderately endemic in Behar; the eastern districts of U. P. (Tarai) and in some parts of the Madras State.

Robert Heilig detected its prevalence in Mysore and in Rajasthan and Devi Chand (1949) found the prevalence of the disease in Himachal Pradesh.

Hookworm disease in Uttar Pradesh.—This State is one of the biggest units in the country comprising 51 districts with a population of 7 crores. No attempt has been made to collect figures from the dispensaries and District hospitals relating to the incidence of the disease. Tarai districts are no doubt heavily infected but other districts are not entirely free from it.

Khare (1951) recorded the highest annual figure as 57 cases of ankylostomiasis in 1949 among 3316 patients representing 1.6% of all admissions in K. G. Medical College, Lucknow. Arora and Sharma subsequently collected 726 cases from the hospital records for the last 20 years and found the district-wise incidence to be :—

TABLE I

District	No. of cases	District	No. of cases
1. Lucknow	140	11. Lakhimpur	15
2. Gonda	72	12. Mirzapur	10
3. Sitapur	71	13. Raibarely	10
4. Barabanki	60	14. Banda	10
5. Basti	45	15. Kanpur	6
6. Azamgrah	35	16. Agra	5
7. Gorakhpur	35	17. Sultanpur	5
8. Faizabad	30	18. Allahabad	4
9. Hardwar	3	19. Bareilly	2
10. Etah	20	20. Shahjahanpur	1

I found about 60 cases in the 5 months from 1-5-'51 to 30-9-'51 from the Medical Wards of Balrampur Hospital in my clinical study and the distribution was as follows :—

TABLE II

District	No. of cases	District	No. of cases
1. Lucknow	18	7. Hardoi	2
2. Gonda	4	8. Jaunpur	3
3. Barabanki	8	9. Basti	2
4. Raibarely	6	10. Bahraich	2
5. Gorakhpur	4	11. Faizabad	4
6. Sitapur	5	12. Sultanpur	2

It is surprising that inspite of the large amount of work being done on various aspects of the disease, particularly its incidence in various regions of the country by workers like Rogers, Megaw, Chandler, Gupta, Khare and others, there are still zones of heavy incidence where the infection has remained undetected and the infestation persists. This is further supported by the finding that the percentage of positive stools for the ova of *Ankylostomes* is between 5 and 6% as observed from the number of stools examined in the Pathology Department of the Balrampur Hospital at Lucknow.

Year	Total No. of stools examined	Stools positive for ova of hookworm	Percentage
1951	2559	173	6.7 %
1952	2919	110	3.7 "
1953	3152	173	5.4 "
1954	3231	201	6.2 "
1955	3843	173	4.5 "

These figures do not however, adequately portray the really heavy incidence in the State. The reason is quite simple. *Firstly* the villagers coming to our hospital represent only a fraction of those who are actually suffering because they are mostly treated in the dispensaries and district hospitals which are within easy reach. They only go to big institutions when they are in some serious condition. Moreover some take treatment from private medical practitioners. *Secondly* the mild cases remain undetected and undiagnosed for want of any symptoms. These patients are ambulant being a constant source of infection in the community. Therefore, the real extent of the incidence is difficult to assess. Ankylostomiasis is therefore a condition which is diagnosed only when one thinks of it. A mass survey of the total population of any locality using the concentration method of stool examination will alone furnish a correct estimate of the true incidence.

Mode of infection.—Looss worked out the life history of the parasite in 1912. Adult worms both male and female live in the small intestine of the normal human host. The female lays from 10,000 to 30,000 eggs per day. An infected individual usually defaecates in the field or near a tank or other water source.

1. *Infection through the skin*:—If the eggs do not find a suitable medium for development they perish; in a septic tank they get destroyed within 40 days; the larvæ survive in the soil up to 15 weeks if suitable moisture and temperature conditions are available; they die, if the temperature falls below 50°F or if the ground became excessively dry.

The stools get mixed up with the surface layer of the earth due to the moisture from the soil, the ablution water or by rain. Within 48 hours the larvæ emerge and migrate. On a sandy soil many burrow down to about a foot or more. Again when they come out to the surface (now, they are infective to man) they crawl up and stick themselves to blades of grass or other plants. From here they pass on to the feet of passers-by and start burrowing into the skin on the sides of the feet, on the dorsum or between the toes.

Laboratory workers are often infected through their hands. Bathers in contaminated water are liable to be infected through any site in their skins.

The larvæ can penetrate normal skin through the hair follicles or through any crack in the epidermis and reach the blood vessels in the dermis—enter the venules in the blood stream and go to the right side of the heart to pulmones; penetrate the wall of an alveolus and migrate *via* the bronchioles and trachea travel up to the epiglottis and descend down the œsophagus into the stomach (escape the acidity) and enter the small intestines, attach themselves to the mucous membrane and there develop into the male or female adult worm.

Not all the larvæ that start from the skin reach the intestines, some evidently die in this long and strenuous journey.

From the entry of the larvæ to the passing of the ova in the stool it usually takes about 42 days.

It is estimated that 70% of adult worms disappear from the intestines within a year, and nearly all of them within 3 years. Rarely may they last for 9 years.

Dogs, pigs and jackals eat human fæces. Some of the larvæ are destroyed in their intestines but many survive so that these animals may act as disseminators of the infection from place to place.

2. *Through the mouth*:—The larvæ may also gain entrance to the mouth, through contaminated water, food and soiled fingers. Since the discovery by Looss of the percutaneous route, infection through the mouth has been considered to be only of secondary importance, though, *this mode of transmission of the parasite is more common than is generally believed*, (Stiles). This requires further confirmation.

We cannot be certain when a patient acquired the infection. The history of 'ground itch' at the site of larval penetration into

the skin or of cough at the time when the larvæ enter the bronchial tree can never be elicited.

3. *Can infection take place by the ingestion of eggs?*—In order to find out if infection can take place, just as in the case of *ascaris lumbricoides* or *oxyuris vermicularis*, I carried out an experiment on a monkey.

Ova of hook-worm were collected from the under-surface of the slide used for stool examination by the concentration method; concentrated sugar solution was used for diluting the fæcal matter; and a stool examination of the monkey was first carried out to exclude any pre-existing helminthic infection.

On 4-7-'53—A monkey was fed with the sugar solution containing the eggs *not* larvæ.

On 5-7-'53—Actively moving larvæ of hook-worm were seen in the stools of the monkey.

On 4-8-'53—Besides larvæ, ova containing larvæ were also detected.

On 4-9-'53—The findings were as on 4-8-'53; examinations at periodic intervals during this period gave the same findings.

On 4-10-'53—Complete hook-worm ova with 4 to 8 nuclear mass were detected and this continued to be the case over a long time.

Postmortem observation to find out if any full-grown worms could be found in the intestines of the monkey could not be carried out.

The experiment repeated a second time to produce similar infection in another monkey, proved a failure.

(These experiments will be repeated again and again to confirm this mode of infection).

PATHOGENESIS:—The parasite usually inhabits the jejunum but in cases of severe infestation it may be found also in ileum.

In one patient (Case No. 16) who died in the Balrampur Hospital an autopsy was done within 6 hours after death. The whole alimentary tract from the cardiac end of the stomach to the pelvic colon was taken out. 86 worms were found in all, a few crawling about mixed up with the intestinal contents and mostly sticking to the mucosa of the small intestine, quite a few were collected in the act of copulation. Red streaks of blood could be seen in nearly all the specimens. None were found in the stomach or duodenum, the maximum number being confined to the first part of the jejunum. The number gradually diminished in the lower parts. None were found in the cæcum, colon or appendix.

The presence of the parasite gives rise to certain morbid conditions such as:—(a) an ulcerated area in the mucous lining

of the intestines with a chronic inflammation leading ultimately to macrocytic anæmia; (b) a liability to the absorption of toxic substances into the system through the ulcerated areas; (c) a mechanical blood-sucking action by the parasite, the bitten spots in the intestinal mucosa remaining as bleeding spots; and (d) the potential risk of secondary bacterial infection.

Both male and female worms suck blood, much more than what is required for their own nutrition. It has been estimated that a single *Ankylostomum duodenale* draws about 0.67 cc. about 12 minims of blood in a day. Further it has been observed to be more pathogenic than *Necator americanus*.

The larvæ of *Ankylostoma duodenale* cause less ulceration and pain at the site of penetration and hence the chances of finding the typical creeping-eruptions are fewer.

After penetration, the larvæ may remain in the epidermis for weeks or even months. Some do not immediately find their way into the venules of the skin. They are likely to be phagocytosed in the tissues. Acute general symptoms, like fever continue like typhoid with eosinophilia; leucocytosis may follow.

When the skin symptoms subside, other symptoms like cough, a sensation of throat obstruction, dysphagia and aphonia may appear. Gastro-intestinal symptoms, like colicky pain and dysentery are usually pronounced in the acute stage. Therefore the diagnosis of *Ankylostomiasis* can be established only when one thinks of it and confirms it by stool examination by the concentration method.

When the adult worms settle down in their places, all symptoms tend to subside. Mild cases move about like healthy persons but are carriers who are only accidentally diagnosed as such. If treated in time, they do good to themselves and also to the community at large. Several cases, owing to malnutrition develop further complications and chronic manifestations e.g., anæmia and toxic conditions of the system.

Anæmia is perhaps the most striking morbid change. The degree of anæmia can easily be estimated by the tests for hæmoglobin, total R.B.C. and the hæmatocrit values.

The type of anæmia in these cases is nearly always hypochromic and microcytic.

The serum protein is slightly decreased while the calcium, and cholesterol levels remain unaffected.

It is now well-established that it is a true secondary anæmia due to the adult worms continuously sucking large quantities of blood from the circulation into the lumen of the intestinal canal.

Researches by Leo Loeb and Allen J. Smith have demonstrated that the secretion of the worm, probably coming from cephalic glands, contains a substance an anti-

comparable to the "hirudine" extracted from the head of leeches. This substance by preventing the coagulation of blood that flows from the ulcers in the intestines, favours constant bleeding from the area resulting in anæmia. *Dimorphic anaemia* showing a macrocytic hypochromic blood-picture with a high M.C.V. and low M.C.H.C. was seen in my cases; this was also reported by Chatterji and Das Gupta in 1953.

Macrocytic anæmia is due to a deficiency in the absorption of the hemopoietic principle from the gastro-intestinal tract and to a depression of the bone-marrow affecting the hemopoietic principle.

The majority of these cases respond to heavy doses of iron with a good protein diet or even iron alone. There are a few exceptions in which the blood level cannot be regained unless deworming is effectively done. Some authors consider that worms may introduce some toxin or allergin that depresses the hemopoietic function. Napier, Das Gupta and Majumdar (1941) failed to obtain any evidence of the repressive effect on the marrow of the hypothetical toxin, by carrying out a large number of blood examinations and sternal punctures.

Heiling and Visveswar (1943) carried out a number of examinations on the frog's heart to know whether a 'Hookworm Toxin' existed or not, but without attaining definite results of value. However the depressive effect of the hookworm patient's serum was observed so long as deworming was not done. These results did not however, prove the existence or the action of a hookworm toxin.

Clinical findings.—It is difficult to diagnose an acute infection of *Ankylostomiasis* because of the mild symptoms of cough, skin-irritation and gastro-intestinal disorders etc., which are very common in daily life. One can never ascertain when and where the infection took place, how often he was exposed to infection. Therefore it is futile to determine the incubation period which may be years.

I have studied 25 severe cases of chronic *ankylostomiasis* and tabulated the findings in a statement. (See Table III, on pp. 182 and 183).

It will be seen that:—(1) The hookworm infection produces a strictly "iron-deficiency anæmia" (I.D.A.) which responds well to full doses of iron. (Napier *et al*, 1941 and Heiling, 1941). The patient responds to large doses of iron better after deworming than before deworming. (2) Infection and reinfection render the I.D.A. to become iron refractory by: (a) reducing iron absorption; (b) diminishing the iron-binding capacity of the serum; (c) diminishing the saturation percentage of iron-binding protein and (d) obstructing hæmoglobin synthesis. (Robson and

TABLE III. Clinical Findings in

No.	Name	Age	Total R.B.C. in mill per c.mm.	Hb. % in gram	Total W.B.C. per c.mm.	P %	L %	E %	E.S.R. correct-ed mm. 1st hr.	P.C.V. %	M.C.V. Cu. μ
1	S.P.	25	2.3	5.0	16600	62	13	25	22	25	125
2	M.D.	30	1.6	4.25	6100	51	39	10	18	18	113
3	P.D.S.	35	2.9	3.5	12300	63	24	13	16	20	66.6
4	S.K.	53	1.6	5.00	7050	68	20	12	13	24	150
5	V.R.	7	1.3	3.25	10000	47	20	33	13	16	123
6	K.N.	125	.70	2.0	5000	56	15	27	1	8	114
7	S.S.	50	2.0	4.50	7600	53	14	33	12	20	100
8	S.D.	30	2.0	4.25	9150	63	22	15	25	21	105
9	H.K.	12	2.3	4.5	11600	33	27	40	15	24	100
10	M.C.	19	2.6	3.0	7200	54	24	12	9	17.5	70
11	S.N.S.	25	2.2	3.5	5800	57	23	20	10	18	81
12	D.B.	27	2.0	2.75	4150	62	31	7	1	14	70
13	G.	50	.8	3.0	13800	93	7	—	7	12	150
14	G.N.	9	2.2	5.0	8150	67	32	1	11	19	89
15	G.N.	26	2.1	4.5	4300	51	31	18	9	21.8	103
16	M.	32	1.0	3.0	3200	77	17	6	0	10	100
17	R.S.	30	1.7	4.0	600	60	26	14	1	13	76
18	M.A.	12	1.1	2.0	10000	54	33	16	0	8.7	79
19	R.A.	50	1.6	2.5	14000	89	10	1	0	8	50
20	M.Y.	22	3.0	5.5	8400	59	19	22	15	25	83.3
21	R.H.	10	2.1	3.0	10550	70	13	15	11	16.3	74.2
22	M.H.	40	.89	2.25	5300	80	8	12	11	13	144
23	U.L.	35	1.7	5	5500	72	22	6	9	15	88
24	R.A.	35	.8	2.5	7000	78	13	9	11	14	175
25	B.	35	1.8	4.5	10000	86	14	0	16	20	110

Mac=Macrocytic
Hypo=Hypochromic

Hyposat=Hyposaturation
Hyper=Hyperchromic

Intravenous iron therapy has decidedly been very effective in such cases. (3) Liver extract, Vit. B complex combinations did not show any effect on the blood-picture before de-worming. (4) In severe cases, even blood-transfusion may not be as

25 Cases of Ankylostomiasis

M.C.M. m.m.g.	M.C. H.C. %	Type of anæmia	Ova per gram	Occult blood	Total protein G%	V. B R E A	Skin eruption	G.A.
25	20	Mac Hypo	9500	+	7.9	—	—	Ach
27.8	23.4	Mac Hyposat Normch	3000	+	5.7	—	—	—
11.6	17.5	Mic Hyposat Hypo	13700	+	6.58	—	—	N
31	20.0	Mac Hyper	7000	+	5.76	—	—	—
25	20.0	Mac Hyposat Hypo	9000	+	6.84	—	—	—
28	25	Mac Hyposat Normo	17600	+	5.0	—	—	N
22.5	22.5	Mac Norsat Hypo	8000	+	6.48	—	—	N
21	20.0	Mac Hyposat Hypo	23000	+	7.56	—	—	Ach
18	180	Mac Hyposat Hypo	10500	+	7.9	—	—	—
12	17	Mic Hyposat Hypo	4200	+	7.5	—	—	Ach
16	19	Mic Hyposat Hypo	25000	+	5.7	—	—	N
13.7	19.6	Mic Hyposat Hypo	23400	+	6.4	—	—	N
37.6	25	Mac Norsat Hypo	6000	+	6.4	—	—	—
22.7	25.5	Mic Norsat Hypo	18000	+	7.2	—	—	N
21	20	Mac Hyposat Hypo	20000	+	6.2	—	—	—
30	30	Mac Hypersat Hypo	8000	+	7.2	—	—	L.N.
23	30	Mic Hypersat Hypo	8500	+	7.9	—	—	Ach
18	22.9	Mic Hyposat Hypo	6000	+	5.6	—	—	L.N.
15.6	31	Mic Hypo	10000	+	7.56	—	—	N
18.3	22	Mic Hyposat Hypo	8000	+	8.2	—	—	—
15	18	Mic Hyposat Hypo	10400	+	5.6	—	—	H.N.
25	17.3	Mac Hyposat Hypo	9600	+	5.0	—	—	L.N.
29.4	33.3	Mic Hypersat Hypo	8600	+	5.09	—	—	N
31.2	17.8	Mac Hyposat Hypo	8700	+	4.8	—	—	Ach
25.0	22.5	Mac Hyposat						

Norsat=Normosaturation
Mic=Microcytic

Ach=Achlorhydria
N=Normal limit

L.N.=Low Normal
H.N.=High Normal

effective before de-worming as large doses of iron after de-worming. (5) A gradual increase in hæmoglobin and an improvement in the blood-picture have been observed with good diet, only after de-worming, without any additional iron administration.

(The improvement was of course slow). (6) Macrocytic and dimorphic types of anæmia are also common in chronic ankylostomiasis, probably due to dietetic deficiencies. The macrocytic type constituted, about 42% only. (7) Bone-marrow picture in severe cases did not show any great variations from normal. (8) There is no correlation between the severity and type of anæmia and the intensity of the infestation. (9) Occult blood-test of the stool in all cases was positive and it became gradually negative sometime after deworming. (10) Erythrocytic sedimentation rate after the 1st hour (corrected for anæmia) in every case was within normal limits. (11) Vanden Bergh reaction was negative in all cases and the icteric index was below 10 units. (12) The eosinophilia count ranged from 0 to 40 per cent. (13) No signs of 'ground itch' or any history of skin eruption could be found on the hands or feet in any of my cases. (14) The infesting parasite in all cases was 'Ankylostomum duodenale'. (15) The gastric activity had no relation to the severity of infection. It was near the low normal level. Achlorhydria was present in both types of anæmia (microcytic and macrocytic). (16) Tetrachlorethylene was found much more effective than thymol. (17) All cases included in this study were from vegetarians, only a few were however occasional meat-eaters.

PREVENTION:—The prevention and control of the disease require to be tackled from different angles and an accurate assessment of the requirements should include: (1) the detection and treatment of infected persons after a controlled survey of a given locality and (2) the protection of the people against infection and reinfection.

TREATMENT:—(1) *Oil of chenopodium* has been in use since 1951. It is good in mixed infections of hookworm and round-worm.

(2) *Thymol* was introduced into the field by Bozzolo, as being undoubtedly the best drug. Three courses are usually required to reduce the hookworm load to a negligible figure. Unpleasant side-effects, are usually found to follow its use. (3) Of the newer drugs, Carbon-tetrachloride is considered to be the best and a specific against ankylostomes.

In order to avoid the resistance-phenomenon, carbon-tetrachloride is combined with oil of chenopodium. This has been the practice for some years.

Recently three new drugs have been introduced and found to be active against ankylostomes: (a) Hexylresorcinol; (b) tetrachlorethylene; (c) essential oil of chenopodium or hydroxylene. A complete radical cure is claimed for these drugs. Tetrachlor-ethylene is the drug of choice, and is best given in the form of a suspension or in a capsule (Tetracap) 1 cc. and 2 cc. It is non-toxic and is not contraindicated in any condition except fevers.

MODE OF ADMINISTRATION:—(*Adults*)—The patient is given a light supper at night, and early on the next morning 4 cc. of the medicine is shaken up with Soda sulph or Mag sulph. solution.

Water is given to the patient to drink. The bowels move after about 2 hours.

If there is no motion, repeat the Mag. sulph. and do not give any food till the bowels have moved.

Children:—4 minims per year of age, given in the same way or more conveniently mixed with some syrup. Give Soda sulph afterwards. Worms are passed in the next 4 days. The criterion for a cure is that there should be no ova in the stool. If ova are seen, another course must be given.

II. Prevention of infection.—In India our villages are usually surrounded by agricultural lands and cesspools at a slightly low level. Water in these pools is extremely muddy and contaminated with faecal matter derived from men and animals. The soil is humic because of decaying vegetables and leaves. In the presence of moisture and contaminated soil, infectivity increases. Therefore, it is essential to estimate the infectivity of the soil in order to render it unfit for the development of larvæ. The technique described by Craig and Faust (1943) is as follows:—“The soil sample is placed in a little basket made of 1 mm. mesh bronze-screening lined with cheese cloth. A glass filter funnel is taken and put in a round ring stand. At its lower end a small rubber tube is fitted with a pinch-cock. The funnel is filled with lukewarm water. The basket of soil is so placed on the funnel that the lower surface of the soil touches the upper surface of water in the funnel.

Within 10 to 15 minutes nematode larvæ if present in the soil migrate down to the stem of the funnel. After an hour, 25 to 30 cc. of water is drained off. The suspension is centrifugalized and the sediment examined for larvæ:—

The infectivity of the soil can be estimated in this way and people warned against going to such places bare-footed. Infected soil so detected is rendered non-infective by salting them, as larvæ do not develop in water-logged, clayey or salted surfaces. Prevention of soil-pollution remains the only measure which can be relied upon to achieve the eradication of hookworm disease.

The following steps will help to protect people from infection: (a) Educating the people not to defæcate in the open fields and maidans frequented by people, as infected soil will spread the disease. (b) Advising people to use *chappals* or shoes always and not walk bare-footed. (c) In the absence of latrines and privies in rural areas, the setting apart of a special open area adjoining the village, suitably fenced or walled for use by the

people in answering Nature's calls. (d) Wherever possible the provision of trenches or borehole latrines for the purpose. (e) Cautioning people against using vegetables cultivated in infected soil from which microscopic larvæ may get on to the vegetables ready to infect the careless user, who omits to wash the vegetables in clean good water thoroughly before use. (f) Ensuring the hearty and willing co-operation of the people in all preventive methods by educating them in the potential risks that may befall them due to neglect. (g) Fighting the bane of malnutrition which is affecting the majority of our people by providing adequate, healthy, nutritious and cheap food to all and (h) by doing incessant propaganda among the rural population.

The eradication of Hookworm disease in our country can be achieved only if proper and strict control measures for early detection, suitable prompt treatment and follow-up are instituted and preventive work on the lines indicated is carried out in all the States.

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SUDDEN DEAFNESS AND ITS RELATION TO ATHEROSCLEROSIS

A study by Dr. Hallberg of Rochester of 178 cases of sudden deafness of obscure origin led to the classification of 89 cases as having probably a vascular explanation. Of the 89 cases, 30% were in the 20 to 30 year age-group; since less than 4% of all cases of angina pectoris fall within this group these two conditions differ markedly in their age distribution. More intensive study of the 27 patients in this group revealed that 3 had vascular accidents in other parts of the body. Four whose blood was tested for cholesterol, fatty acids, and total lipids gave high-normal or supernormal values strongly suggesting atherosclerosis. Two cases histories given in detail illustrate the evidence that the sudden deafness was probably caused by vascular accidents involving the blood supply to the internal ear. Patients with sudden deafness of obscure origin should therefore, be examined with the possibility of atherosclerosis in mind, so that appropriate treatment can be instituted. (J.A.M.A., 165 : 13, November 30, 1957).

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IS DERMATOLOGY AN INTERESTING SUBJECT?

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THERE are many doctors and nurses who do not give a pride of place to dermatology. The skin being the outer covering of the body, many internal organs reflect disease by external manifestation on the skin and *vice-versa*. Many skin diseases are complicated by involvement of the internal organs. Hence an adequate knowledge of general medicine and dermatology is necessary for physicians and nurses and a dermatologist must be a good physician.

An adequate knowledge of the anatomy, physiology and pathology of the skin is essential for a proper understanding of dermatology.

Anatomy and histology of the skin.—The skin is one of the essential organs of the body performing vital functions. It is a sensitive organ varying in colour under different conditions of climate, age, sex, health and race.

The skin has three general layers:—(a) the epidermis or cuticle; (b) the dermis or corium and (c) the hypodermis or subcutaneous tissue.

Several structures are found in the skin, *viz.*, sweat glands; sebaceous glands, hair follicles, pigment layer of the skin, blood vessels, lymph vessels, muscles and nerves.

The epidermis has five layers:—(a) the stratum corneum; (b) the stratum lucidum; (c) the stratum granulosum; (d) the stratum malphigi, and (e) the stratum basale containing the pigment-producing cells.

The dermis contains the nerves, blood vessels, lymphatics, small muscle fibres, hairs, sweat glands and sebaceous glands. Non-medullated and medullated nerve fibres are found in the skin. The non-medullated nerve fibres reach up to the epidermis and connections have been reported with the prickle cell layer. They are also connected to the hairs and sweat glands. The medullated nerve fibres pass into the papillary and sub-papillary regions and are connected with the pacinian and tactile corpuscles. The precise function of the pacinian corpuscle is not known. Its connection is probably with tactile cells. Dr. Krause is of opinion that they help in the appreciation of pressure and traction. The tactile corpuscles of Meisner are touch receptors, and are ellipsoidal in shape. A basket-like ending of tactile corpuscles round the hair follicles is also described, concerned with perception of the mechanical displacement of hairs. The end bulbs of Krause are concerned with cold, and a similar

* Specially contributed to the *Annals*.

organ, Golgi with warmth. The sub-epidermal plexus of nerves serve as pain receptors.

Muscles:—The arrector pili are concerned with hair follicles and sebaceous glands. Contractions aid in the expulsion of the sebaceous secretion. When the skin is exposed to cold they are responsible for the cutis anserina or goose-flesh.

Pigmentation:—The normal colour of the skin is influenced by the vascularity of the skin and the thickness of the epidermis. The pigment melanine is formed in special cells in the deeper layers of the epidermis in relation to the basal cell layer. These melanine-forming cells are similar to the cells of the central nervous system and send out dendritic processes which end in a button-like end cup. Melanine is formed in the cytoplasm of these cells and secreted via the end buttons and ingested by the basal cells. Some of the pigment is transferred from the dermis to the connective tissue cells which act as carriers. These cells are called chromatophores or melanophores.

Theory relating to melanine formation:—Melanine is formed from Tyrosine. A melanocytic stimulating-hormone from the anterior pituitary controls melanine formation.

Sweat glands:—These are supplied by cholinergic fibres present in the sympathetic nerve fibres. There are two types of sweat glands. (1) Eccrine which are distributed over the body and face and secrete a dilute solution. They are dense on the palms and soles. (2) Apocrine glands which are distributed mainly in the axillæ, around the nipples and in the female in the labia majora and mons pubis. They form a secretion of varying composition and a characteristic odour.

Triple response of the skin:—When the skin of a normal person is given a firm blow with a pointed instrument a triple response is produced:—red lines, flare and wheal. The red lines develop in 3 to 15 seconds and are produced by a capillary dilatation. The flare or spreading flesh takes up a few seconds and is produced by arteriolar dilatation. The wheal or local oedema is produced in 1 to 3 minutes due to transudation of fluid from the capillaries. This triple response is produced by histamine-like substances from the epidermal cells.

Diagnosis in dermatology and the dermatological alphabet:—The first requisite is to get a correct history from the patient regarding his chief complaint, the type, location and duration of the lesion, mode of onset, tendency to regression or spread, family history, and past history of allergy, constitutional disturbance and drugs. Special tests are used both for diagnosis and management.

They are:—(a) *Skin biopsy*:—A scalpel usually suffices for this. But a dermal punch if available will be more useful. Under local anæsthesia small sections of skin can be removed without much inconvenience to patients. They are collected in 10% formalin, labelled and then sent to the pathologist.

(b) *Diagnosis and differential diagnosis of fungi*:—The material from suspected lesions is collected in 10% potassium hydroxide and examined under a microscope. Only in special cases cultural examination is required.

(c) *Patch tests*:—These are helpful to find out the suspected allergen.

(d) *Intradermal tests*:—In certain cases these steps are employed namely Tuberculin, Tricophytin, Sporotrycine.

(e) *Dioscopy*:—Pressure on lesion with a microscopic slide reveals the appearance of the lesion after the blood has been driven out of the capillarized and superficial venules. In lupus vulgaris the so-called apple-jelly nodules are seen.

(f) *Hand microscope with two hundred magnifications* helps in studying the details of the lesion.

(g) A Wood's light helps in the study of fungus infection of the scalp.

(h) L.E. cell demonstration with sternal marrow biopsies is an important diagnostic sign of lupus erythematosus.

Dermatological alphabet.—(a) a *macule* is a spot without elevation of skin e.g., measles; (b) a *papule* is a solid elevated lesion less than 5 mm. in diameter e.g., furuncle; (c) a *nodule* is a solid elevated lesion over 5 mm. in diameter e.g., fibroma; (d) a *vesicle* is an elevated fluid-containing bleb, 1 to 5 mm. in diameter e.g., chicken-pox; (e) a *bullæ* is an elevated fluid-containing lesion which is over 5 mm. in diameter e.g., pemphigus; (f) a *pustule* is an elevated skin lesion containing pus; (g) a *wheal* is an evanescent solid elevation e.g., urticaria; (h) a *comedo* is a plug of secretion in a hair follicle e.g., acne vulgaris; (i) a *burrow* is a characteristic lesion in scabies; (j) a *scale* is fine powdery matter caused by scraping lesions e.g., tinea versicolor; (k) a *fissure* is a crack in the skin; (l) a *crust* is a dried exudate; (m) an *excoriation* is linear lesion usually self-produced; (n) an *ulcer* is a break through the epidermis; (o) *melanoderma* is a black pigmentation of the skin; (p) *leucoderma* is a loss of pigmentation in the skin and (q) *lichen* denotes an aggregation of papules.

General principles in the local management of skin diseases.—The external applications used in dermatology are:—

Baths.—(a) *Saline baths* are useful in extensive sepsis or extensive dermatitis; (b) *bran or starch bath* is useful in intense itching. For the bran bath, 2 lbs. of bran (for a 30 gallon

bath) should be tied loose in a muslin bag. The bag is squeezed at intervals. No useful purpose is served by putting the bran direct into the bath. For the starch-bath, one lb. of starch powder is added to 30 gallons of hot water; (c) *alkaline bath*:—2% of sodium bicarbonate is helpful in the removal of crusts; (d) *tar bath*:—Liquor picis carbonis is applied first to the skin which is then immersed in warm water for 15 minutes and later dried and dusted with some inert powder or covered with lanoline. This treatment is useful in psoriasis. Some advise the addition of half an ounce of liquor picis carbonis to a tub of hot water.

Soaps.—Midgley's medicated soap No. 3 has been found useful in Acne vulgaris to remove excess of sebum. Soft soap is useful in psoriasis, sulphur soap or Tetmsol soap in scabies, spirit-soap is used as shampoo in seborrhœa capitis. Soaps are contraindicated in eczema.

Powders are used to dry the skin and to prevent friction between opposing surfaces. A fungicidal powder containing undecylenic acid and propionic acid is useful in the management of dermatophytosis of the hands and feet. Cooling anti-pruritic powders contain menthol in talcum.

Lotions are aqueous suspensions of powders, and are more efficient when applied with a paint brush. They exert an anti-pruritic and astringent action. Calamine lotion is the one most frequently used.

Creams.—Creams and liniments like Zinc cream and Calamine liniment are useful preparations for use in the inflamed stage of the skin.

Ointments contain a greasy base and are widely used for external application. Ointments may be fungicidal e.g., white-field; *antibiotic* e.g., aureomycin; *anti-pruritic* e.g., antihistamines and *anti-parasitic* e.g., sulphur ointment.

Pastes are preparations in which solid ingredients and greasy bases are present in equal proportions. They are less-heating than ointments. They do not cause the same degree of maceration of the epidermis and form a protective covering. They are helpful in the sub-acute stage of eczema.

Plasters.—Plasters containing salicylic acid are used in reducing horny thickenings. The type of preparation and the drug used depend on the skin condition.

Physical methods of treatment in dermatology are:—

(1) Carbon dioxide snow and galvano-cautery both useful in the removal of warts; (2) superficial X-ray therapy—in chronic eczema and (3) the application of U.V.R. in leucoderma.

Diseases of the skin due to animal parasites are scabies and pediculosis.

I. Scabies.—This is a most common contagious disorder of the skin caused by the itch-mite. The female parasite is a minute white organism, oval in shape with 4 legs in front terminating in suckers and four behind terminating in spines. The male is half the size of the female. The impregnated female burrows into the horny layer of the dermis advancing at the rate of 0.5 mm. per day and leaving a trail of eggs which hatch in four days producing 6 legged larvæ, then the 8 legged nymphs and finally the adults.

SYMPTOMS:—The characteristic lesion is a cunicular burrow or gallery. With this lesion vesicles commonly develop. The itching produces pustules, crusts, excoriations and pigmentation. The commonest sites are the webs of the fingers, the ulnar border of the hands, the anterior axillary folds, the buttocks and the pubic regions.

Norwegian scabies:—It was first described by Boeck in a leper. The disease is characterized by extensive crusting composed of dry pus and scales riddled with galleries containing numerous parasites. Destruction of the nails is not uncommon. The commonest complication is nephritis.

TREATMENT:—Depends on whether the condition is infective or non-infective. In the non-infective stage sulphur ointment is the drug *par excellence*. Before application, a thorough bath is given with warm water, rubber-brush scrubbing and soap in order to lay open the burrows. The disease is contagious. Hence every member of the family is to be examined and treated. The clothes worn must be sterilized by boiling in water. The ointments used are:—(1) Danish ointment; (2) 5 grains of Betanaphthol to one ounce of vaseline; (3) 25% Benzyl benzoate emulsion; (4) Eurax ointment; (5) Unguentum potassium polysulphuris and (6) Tetmosol.

During the infective stage, plain zinc cream is applied externally and a course of antibiotics is given to control the infection.

II. Pediculosis.—Three varieties of lice infest the human body:—(a) The head louse; (b) the body louse; and (c) the crab louse. Pediculosis capitis is infection by the head louse. The head louse has three pairs of legs and attaches its eggs to the hairs of the head. The egg is contained in a cup-shaped receptor cell-unit. Pediculosis capitis induces scratching and secondary infection.

TREATMENT:—Consists in clipping the hair short and applying 7% D.D.T. in Xylol, ether and liquid petrolatum.

Pediculosis is produced by the body louse. The violent scratching causes thickening and pigmentation of the skin which is called *Vagabond's disease*. The body louse also transmits

relapsing and typhus fevers. Prophylaxis consists in the destruction of the lice in clothes, by applying to the clothes dry or moist heat and 10% D.D.T.

Pediculosis pubis is caused by the *pubic louse* or *crab louse* the nits are attached to the pubic region and the bite inflicted by the *Pediculus* causes irritation. Treatment is similar to that for *Pediculosis capitis*.

Diseases due to plant parasites:—*Fungus diseases* of the skin caused by plant-parasites fall into three groups:—(1) Superficial mycosis which includes ring worms; (2) Intermediate mycosis which includes moniliasis, chromoblastomycosis and Madura mycosis and (3) Systemic mycosis which includes: (a) Actinomycosis, (b) Blastomycosis, (c) Coccidiomycosis, and (d) Histoplasmosis.

Superficial mycosis.—Is limited to the superficial layer of the skin and certain of the appendages. The following will come under this group: (1) *Tinea circinata* or ring-worm of the skin which is a more or less circular lesion spreading out peripherally forming rings. The peripheral margins may show minute vesicles; (2) *Tinea cruris* or Dhobi's itch found in the groins and natal clefts; (3) *Tinea* of the hands and feet, which includes *Tinea pedis* or Athlete's foot; (4) Dermatophytosis of the hands is known as Housewife's disease. Four principal types of *Tinea* of the hands and feet may be described: (a) the sodden white skin between and underneath the toes; (b) scaling of the hands (palms) and the feet; (c) vesicular lesions; (d) hyper-keratotic lesions; (5) *Tinea unguium* or ringworm of the nails; and (6) *Tinea barbæ* the fungus infection appearing in the beard or moustache area, which is of 2 main types: (a) the dry or ringworm of the scalp occurring in children. Four clinical types may be described.

TYPE I is a great patch ringworm of the scalp occurring in schools and orphanages. The most important feature is a lack of inflammatory response.

TYPE II produces lesions which are multiple and more inflammatory. The hair is broken and stumps of hair may be jutting out.

TYPE III is caused by virulent fungi producing a severe inflammatory reaction. The lesion appears as a single soggy, indurated deeply inflamed area with crusting and scaling. This is called Kerion celsi and resembles an abscess.

TYPE IV is called the black dot ringworm and produces breaking of the shafts of hairs, atrophy, scarring and alopecia.

(7) *Tinea versicolor*: (*ჭაშაშა*) appears as *cafe au lait* patches on the upper part of the trunk and is most common in those

who sweat profusely; (8) *Tinea favosa* is a chronic fungus infection involving the scalp and glabrous skin. The characteristic features are the yellowish cup-shaped crusts or scutula and a peculiar moist odour.

Mycology in superficial mycosis.—Various types of fungi are responsible, viz.: (1) Epidermophytosis, which is commonly found in dhobi's itch and *Tinea pedis*, *Tinea barbæ* and *Tinea unguium*.

TREATMENT:—The following fungicidal ointments are useful:—(1) Whitefield's ointment, (2) 2% Dithrinol, (3) 8% Chrysarobin, (4) 2% Silver nitrate, (5) Propionic acid, and (6) Undecylenic acid. Five and 6 are useful in fungus infection of the hands and feet. Chrysarobin should be used for patches below the neck and for small areas only.

Tinea versicolor.—Usually responds to the application of 3% Tartaric acid followed by 20% Sodium hyposulphite and scrubbing with a rubber brush.

Intermediate mycosis.—These are not strictly superficial lesions consisting of herpetic vesicles surrounded by a red areola. They occur in the groins, beneath the breasts and in the axillæ. The mucous membranes may be involved. Vitamin deficiency and antibiotics predispose to this condition. Systemic moniliasis has also been described involving the gastrointestinal and pulmonary tracts. The treatment of moniliasis is: (a) by the local application of 2% gentian violet; (b) the prevention of occurrence of moniliasis (when antibiotics are used) by the combined administration of antifungal agents like Nystatin, and (c) the treatment of demonstrable vitamin deficiencies.

Mycetoma or Madura foot.—Is an endemic disease caused by *Maduramyces*. The lesions are papules, fixed nodules, indurated areas surrounded by vesicles, abscesses and fistulæ. The disease is progressive.

Treatment is by the application of sulphonamides, X-ray therapy and amputation.

Deep-seated mycosis.—Actinomycosis produces localized and generalized mycosis. The lesions occur on the face producing lumpy jaw. The disease may involve the cæcum and also the lungs.

TREATMENT FOR ACTINOMYCOSIS:—Isoniazid may be useful in a daily dosage of 10 to 18 mg. per kg. of body-weight, over a period of about 10 weeks.

Pyodermas are infections of the skin by pus-forming micro-organisms, producing diverse clinical pictures. The variations are due to the species and virulence of the infecting organism.

Pyogenic infections may complicate skin disease. Chemotherapeutic drugs and antibiotics, are used locally and given systemically for not more than 7 days; for in my experience they produce allergic hypersensitivity when used longer.

The drugs found useful are:—(i) Sulphamezathine tablets and cream. (ii) Penicillin (crystalline) and penicillin cream. (iii) Tetracycline group: Chlortetracyclin (Aureomycin), Oxytetracyclin (Terramycin), and Tetracyclin proper, applied locally and given systemically. (iv) Chloromycetin cream externally. (v) Erythromycin systemically and externally; Ilo-tycin has less risk of hypersensitivity. (vi) Other helpful antibiotics are Bacitracin and Neomycin only externally, as their internal administration produces toxic symptoms.

Pyodermas may be classified as follows:—1. *Superficial glabrous infections*:—(a) Impetigo contagiosa; (b) Ecthyma; (c) Dermatitis repens; (d) Acne varioliformis. 2. *Hair follicles and sweat gland infections*:—(a) Folliculitis of Bockhart; (b) Sycosis vulgaris; (c) Furunculosis, and (d) Hydradenitis suppurativa. 3. *Invasive lesions*:—(a) Acute paronychia, and (b) Erysipeloids.

1. *Superficial glabrous lesions*.—(a) *Impetigo contagiosa* is a contagious disease of the skin characterized by vesicles, pustules and superficial crusts. The crusts are yellowish and appear to be stuck on the skin. The disease is caused by the streptococcus; staphylococci are found in the crusts. The cocci penetrate the skin from without and form a vesicle directly under the horny layer. The stratum granulosum remains intact and forms the base. The infection produces reflex irritation of the cutis and dilatation of the capillaries and extravasation of leucocytes. The vesicles rupture and crusting occurs. The disease is auto-inoculable. Treatment consists in the removal of the crusts by starch-poultice or 2% Soda bicarb solution and the application of a 2% watery solution of Gentian-violet. Antibiotics locally and systematically are helpful.

(b) *Ecthyma*:—Is a pustular infection similar to impetigo but lies deeper. The disease is common in the lower extremities below the knees. The stages are vesiculopustule, crust-formation and ulcer. The treatment is the same as for impetigo. Diphtheria and diphtheroid infections. The clinical features simulate an ecthyma with the appearance of membrane. Anti-diphtheritic serum and Erythromycin are used to treat this condition.

(c) *Dermatitis repens*:—Acrodermatitis pustulosa perstans and Dermatitis repens are similar conditions. The disease usually begins in the finger at the base of the nails and spreads over the palms. New areas of infection spread to the other

fingers. The feet are less involved, The lesion consists of vesicles, bullæ and pustules. Crust-formation also takes place. The causative organism is probably the staphylococcus (albus or aureus). The individual susceptibility is difficult to explain. Histopathologically there are micro-abscesses, parakeratosis, acanthosis and papillamatoses.

TREATMENT:—*External*:—Warm bath with 10% Potassium permanganate and then the application of Silver nitrate solution 3i to 3i, or a solution containing Salicylic acid 15 grains; and tannic acid 60 grains in 2.5 drachms of alcohol.

Other measures are Erythromycin systemically and Bacitracin locally.

(d) *Acne-varioliformis necrotica* is a recurrent pustular eruption which leaves a scar. The lesions are papulo-pustules occurring on the scalp and forehead. Crust formation and scarring eventually take place. Good results are obtained by Ung. hyd. ammoniata and Antibiotics.

2. *Hair follicle and sweat gland infections*.—(a) *Bockhart's folliculitis*:—This is a superficial pustular folliculitis which may occur on any hairy area. The causative organisms are:—Staphylococcus epidermidis albus, producing the mild type and Staphylococcus pyogenes causing the severe type. The commonest site is the front of the leg. Histologically the disease causes a sub-corneal pustule in the opening of the hair-follicle.

TREATMENT:—Consists in applying a 0.5% quinoline emulsion or 1% brilliant-green in 25% spirit. Antibiotics help in this condition.

(b) *Sycosis vulgaris* is a purulent folliculitis over the beard and moustache area caused by Staphylococcus aureus. Red follicular papules occur which later present yellow pustules.

Histologically the essential causes are an indolent type of folliculitis, and perifolliculitis.

TREATMENT:—Consists in avoiding shaving; hairs are clipped away. External application of Vioform cream or any of the Antibiotic creams externally and Erythromycin (Ilotycin) internally are useful.

(c) *Furunculosis*:—Is a crop of boils. A boil is an infection of the pylosebaceous follicle destroying the hair and the sebaceous glands and producing a mass of polymorpho-leucocytes, and a few lymphocytes. Diabetes, debility and focal sepsis predispose to this disease. The lesion will occur alone or in crops, and is hard with central suppuration. The skin over it is dusky red.

TREATMENT:—Consists in tackling the predisposing factors and giving a course of Antibiotics.

Externally the following paste is found to do good :—

R Acid Carbolic	... m x
Ext. Ergotæ liq.	... 3 ii
Amylum	... 3 ii
Zinc oxide	... 3 ii
Vaseline	... 3 iv
Ft. pasta.	

(d) *Hydradenitis suppurativa*:—This is an abscess of the apocrine glands, the commonest site is the axilla though the genitalia may also be involved. Several varieties of Streptococci and Staphylococci are responsible for this condition. The early lesions consist of tender nodules which later fluctuate and discharge pus. The infection is in the subcutis in the apocrine gland and the neighbouring glands are involved by way of the lymphatics. The upper part of the cutis and epidermis become involved only after extensive destruction has taken place.

TREATMENT:—Fomentation; surgery is resorted to when fluctuation is present. The newer antibiotics like Oleandomycin and Erythromycin are useful.

3. Invasive lesions.—Erysipeloid (of Rosenbach) may occur in 3 forms:—(a) mild localized infections occurring in circinate erythema on the fingers and hands which may be accompanied by arthritic symptoms; (b) a diffuse eruption with constitutional symptoms but negative blood-culture and (c) a septicæmic type with endocarditis and positive blood culture. The infection occurs in fishermen who handle live-fish. Dr. Rosenbach isolated a micro-organism called *Claudothrix*. There are different strains accounting for different types. Histologically there is an acute inflammatory process involving the skin and subcutaneous tissues. The epidermis is oedematous.

TREATMENT:—A local soothing application e.g., Calamine or Zinc cream, massive doses of penicillin or broad-spectrum antibiotics are treatments of choice.

(To be continued).

ELECTROCARDIOGRAM OF EARLY AND MILD CORONARY OCCLUSION

Where there is severe and prolonged coronary pain associated with fall in blood pressure, leucocytosis, and pyrexia, the diagnosis becomes sufficiently certain to make excessive searching for electrocardiographic confirmation superfluous. On the other hand, the mild coronary occlusion requires to be distinguished from acute coronary insufficiency and its diagnosis may be established by resort to the right electrocardiographic leads at the right time. To condemn electrocardiography on the grounds that absence of anticipated change means little is as senseless and harmful as the opposite error of reassuring a patient that he has not coronary occlusion on the basis of an ECG taken within a few hours of his attack. Both extremes must be avoided, confirmation of the clinical diagnosis sought with care, and the possibility of an intermediate stage of acute coronary insufficiency or a premonitory condition must be borne in mind.—(*Current Medical Digest*, October 1957).

SQUINT SURGERY*

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SQUINT may be due to a developmental defect of the extra-ocular muscles of the eye, which may become apparent at birth or after a few years. In some there may be a history of mild fever or a slight trauma before the squint becomes apparent. Gross defective vision in one eye can cause the squint. Refractive errors of high degree is responsible for the squint in some cases. Apart from these causes, squint due to paralysis of the nerves supplying the muscles, i.e., III, IV, and VIth cranial nerves is quite common among adults or elderly people. It may be due to general causes like diabetes or intracranial complications like tumours, meningitis etc.

Whatever may be the cause, squint affects the patient in two ways:—(a) Cosmetically it disfigures; and (b) these people do not have binocular vision. Squint is a disqualification for employment in many trades at present. Where people have to



FIG. 1.
Before correction



FIG. 2.
After correction by operation

work with fast moving machinery, or where perception of depth is essential, as in air-pilots and the like, squint is a definite disqualification and a disability. Treatment of squint could be either surgical or non-surgical. Non-surgical measures are: (i) correction of refractive errors with proper glasses, and (ii) orthoptic exercises.

Gross squint may have to be tackled initially by surgical measures to be followed by orthoptic exercises.

* Based on a talk given at Courtallam at the 5th Ophthalmic Conference held in September 1957. Specially contributed to the ANTISEPTIC.

Surgery.—The principle involved is to strengthen the action of a muscle or weaken its action when it is excessive. This can be done by shortening the muscle as by resection of a portion of it or lengthening it by tenotomy. The same purpose can be achieved by cutting the muscle at its insertion, and attaching it at a new point either proximally or distally *i.e.*, Receding or Advancing. More than one muscle may have to be tackled. In some it is necessary to operate on both eyes.

The commonest developmental squint is a convergent squint, where one eye is turned inwards. Here the medial rectus muscle of the squinting eye, may be short and overacting and the lateral rectus of the same eye weak and elongated. Depending on the degree of squint a guarded tenotomy of the medial rectus muscle and the resection of the lateral rectus will correct the squint. The amount of muscle resected has to be judged in each case separately. The next common condition is the divergent squint, where the lateral rectus of the squinting eye is short and overacting and the medial rectus is weak. A study of each case individually is essential to choose the nature of operation. In cases of paralytic squint which have not improved by other methods surgery is indicated.

Anaesthesia.—As most of the patients are children, general anaesthesia—(gas and oxygen) is preferred. In grown-up people the operation can be done under local anaesthesia.

Dangers and complications.—The operation is purely extra-ocular *i.e.*, the globe is not opened. So there is no risk to the vision of the eye. The granulation tissue formed at the site of operation is absorbed in a few weeks and so there is no scar left after the operation.

Conclusion.—If treated early, squint can be corrected to give: (1) cosmetic result, (2) binocular vision. It is our duty to the children and to the nation to see that children do not suffer in their later life for want of proper treatment at the proper time. In grown up people cosmetic results can be achieved by surgery though binocular vision may not be possible.

MASSIVE PULMONARY HÆMORRHAGE FROM BRONCHIECTASIS

It is not commonly realized that massive pulmonary hæmorrhage may be the sole presenting symptom of bronchiectasis. Jackson and Lynn (*Canad. J. Surg.*, 1:42, 1957) present six cases of this nature. The massive hæmoptysis is sometimes the only symptom and is sometimes grafted on a series of smaller hæmoptyses or other bronchiectatic symptoms. Investigation must be immediate and treatment rapid, for this can be an emergency. When bronchoscopy and bronchography have delineated the site of disease, lobectomy should follow as the procedure of choice. (*J.A.M.A.*, 165: 13, November 30, 1957).

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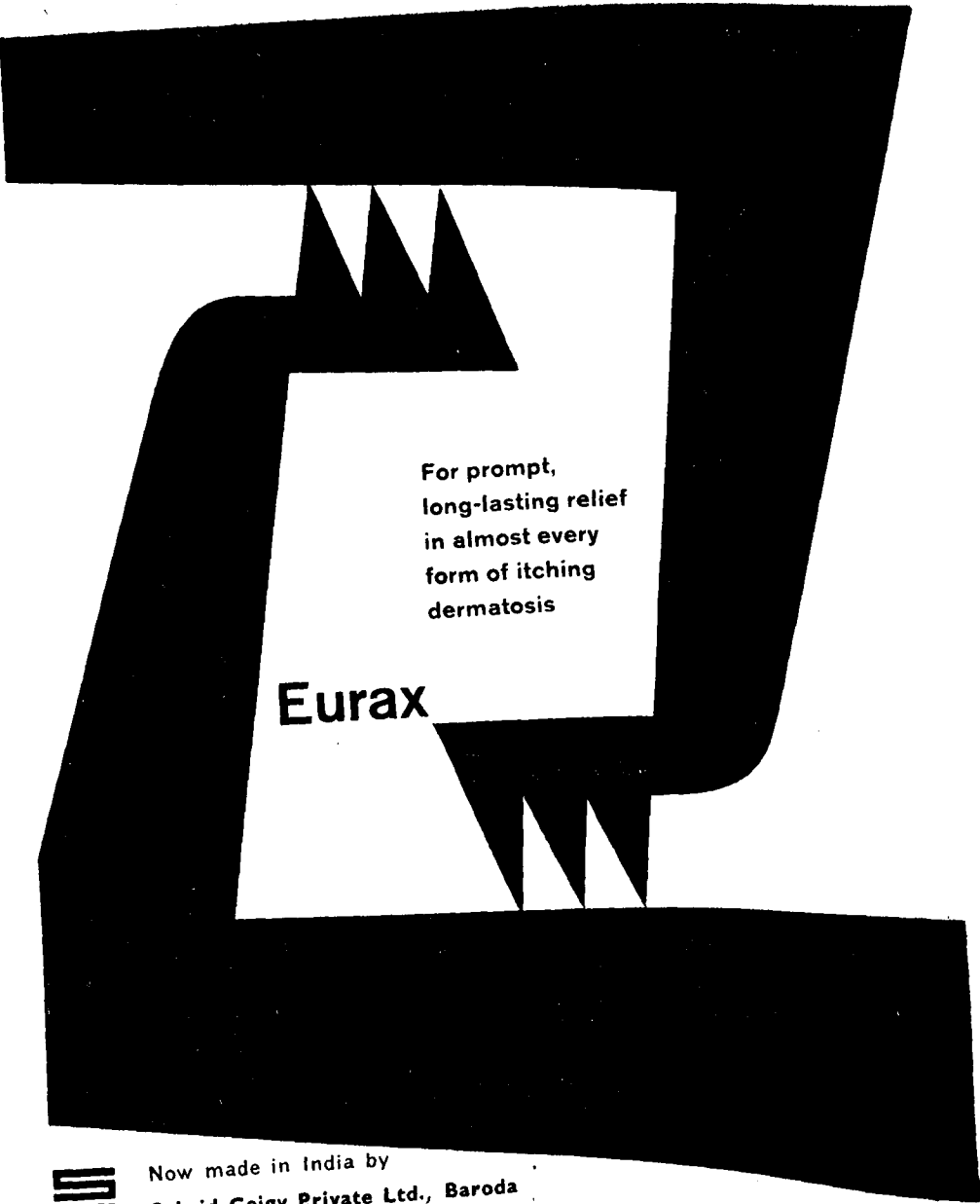
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"THE ROYAL JELLY" (BEE-MILK)*

Its role in the prolongation of life and
Its other therapeutic uses

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IN the long history of mankind constant search has been made to find out ways and means to stave off old age and to prolong the span of life. Various theories have been put forward on the causes of rapid ageing in man. The present trend of thought is that the onset and speed of senescence depends upon three main factors:—(a) The deficient supply or poor utilization by the body of vital nutrient materials, viz., vitamins and essential minerals; (b) accumulation of tissue-waste products in the body leading to atheroma and arteriosclerosis of the cerebral and the coronary blood vessels and tissue fibroses and rheumatism; (c) involution of the reticulo-endothelial system and the sex glands. Pantothenic acid, one of the vitamins has been recently reported to be one of the important factors in the prolongation of life.

Royal jelly (bee-milk) is very rich in Vitamin B complex particularly pantothenic acid. The therapeutic value of the royal-jelly and its possible role in the prolongation of human life is discussed below:—

While studying the pharmacology and therapeutic uses of the venoms of the Indian Cobra and Russell's viper at the Calcutta School of Tropical Medicine, between 1932 and 1940 I reported that cobra and bee venoms gave marvellous relief in neuritis, neuro-leprosy and rheumatic diseases. The bee-venom was reported (Chowhan, 1938) to be specially useful in rheumatoid conditions. I made a detailed study of the bee-farming industry in India at the Government bee-farm at Raison, in the Kulu Valley, in order to find out the prospects of collecting bee-venom in this country for therapeutic purposes. During this study I came to know of various other valuable by-products, besides honey and bee-venom, which could be further exploited to make the bee-farming industry a more paying and attractive proposition in this country. The by-products in the bee-farming industry besides honey and bee-venom are the bee-milk (*Royal-jelly*), bee-bread (*pollen-emulsion*), bee-glue (*propolis*) and bees-wax. Some of the valuable properties of these products were reported by me in 1949. Much more knowledge has been gained about royal-jelly during the 8 years that have since elapsed.

* Specially contributed to the ANTISEPTIC.

The 'Royal-Jelly' is so called because it is the food meant for the future queens of the bee-colony. It is a highly nutritious semi-liquid substance and is reported to be a secretion from the special pharyngeal glands situated in the supramaxillary region of the head of the worker bees. This substance is named *bee-milk* and *jelly*, since it has the composition of milk and the consistency of a jelly. The grub, which is destined to be the queen is fed lavishly with this food during its larval stage and also throughout its life, while the other grubs which are not meant to be queens are given only a very small share of the royal-jelly only for two or three days during their development; they are mainly fed on *bee-bread*, an emulsion of pollen grains, honey and other vegetable matter. These latter grubs, poorly fed on royal-jelly emerge as workers or drones and live only for a short period of 4 to 6 months. While the grubs that has been fed lavishly on royal-jelly emerge as a beautiful large insect, the queen with a prolific breeding-capacity and a span of life as long as 4 to 6 years. The glands secreting the royal-jelly have an anatomical position similar to that of *Rathke's pouch* from which the mammalian pituitary gland develops. This secretion has been shown to possess an anterior-pituitary-like gonadotrophic hormone. Due to the presence of this sex hormone, the royal-jelly is considered to be responsible for the phenomenal reproductive capacity and the long span of life of the queen bee.

Chemistry of the Royal-Jelly.—It is a viscous substance like condensed milk, having a somewhat flower-like odour and rhubarb-like taste. It consists of water 66%, and total solids of 34% of which the protein is 12%, fats 5%, carbohydrates 12%, and ash 1% with some unidentifiable residue. A close similarity has been shown to exist between milk and royal-jelly (see *Table I* below). Both the royal-jelly and milk are gland secretions and both serve a similar purpose in nature. It will be noted that royal-jelly is much richer than milk in its content of proteins, fats and carbohydrates.

TABLE I

Showing the composition of different kinds of milk and of royal-jelly

Substance	Percentage content of				
	Water	Protein	Fats	Carbohydrates	Ash
Royal jelly	66.1	12.3	5.5	12.3	0.80
Goat's milk	86.3	3.6	4.1	4.3	0.80
Cow's milk	87.8	2.7	3.4	4.7	0.70
Human milk	87.5	0.8	3.74	6.37	0.80

A quantitative analysis of the amino-acids (Pratt and House, 1949) in royal-jelly showed the presence of alinine, argenine, aspartic acid, glutamic acid, glycine, isoleucine, lysine, methionine, proleine, tyrosine and valine both as free

amino-acids and as protein hydrolysate. B-alanine, glutamine, taurine and an unknown substance were found in the free state. Free and bound biotine contents of the royal-jelly were found giving our Rf. value of 0.2 to 0.3.

Vitamin content of Royal-jelly:—Vitamin A, C and E if any, are found only in small quantities, while the content of vitamin B is as much as that in whole wheat. The polyneuritic activity of vitamin B towards rats is equal to that of 3 gamma per gm. of fresh and 9 gamma per gm. of dry matter. Vitamin B₁ content is estimated to be equal to that of 6 international units of fresh and 8 units of dry matter. The micro-biological assay of royal-jelly calculated in micrograms per gm. on a dry basis, has been reported to be:—Pantothenic acid 329, riboflavin 28, nicotinic acid 111, pyridoxine 10.2, biotin 4 and folic acid 0.5. Apparently royal-jelly is the richest known source of pantothenic acid. The latter is considered responsible for the long life of the queen bee since she has been lavishly fed on the medium (royal-jelly) which is rich in pantothenic acid. Gardner (1948) fed fruit flies—*Drosophilla melanogaster* oragan with the food medium of banana. Flies fed on the same medium with an excess of pantothenic acid or royal-jelly lived much longer than the controls. It was also noted by Robertson (1928) that flies fed on pantothenic acid, pyridoxine and yeast had increased their longevity by 46.6%.

Gardener stated that pantothenic acid was the primary anti-ageing factor among all components of royal-jelly. Pyridoxine and sodium-yeast-nucleate also played some part in the lengthening of life. These three substances combined together materially helped to extend the life-span. Hydak and Vivino (1950) showed that the contents of (1) thiamine, (2) riboflavine, (3) niacine and (4) pantothenic acid, in royal-jelly vary during different days of development of the bee-larvæ. No. 2, 3, and 4 are rapidly decreased with the increase in the age of queen-bee. The greatest decrease is in the first or the second day of development, showing that these are being rapidly consumed by the grub which will be the future queen.

Gonadotrophic hormone in royal-jelly:—Bee larvæ fed on royal-jelly (queens) acquired a prolific capacity for breeding, 35,000 to 50,000 larvæ per day while those not fed on this substance emerge as workers or drones and are sexless. It has been stated above that the royal-jelly is secreted from the supra-maxillary glands which are embryologically similar in position to *Rathke pouches*, the precursor of the mammalian pituitary gland. An extract from the royal-jelly when injected into immature rats produced a definite increase in the weight of the ovaries by about 60% and the ovaries showed microscopic evidence of strong follicular stimulation.

Bactericidal action of royal-jelly.—The bactericidal and bacteriostatic properties of the royal-jelly were demonstrated by McClasky and Melampy in 1939. The bacteriostatic action was found to be more marked against gram-positive *Staphylococcus aureus* and *B. mutans* than the gram-negative *Escheria coli* and *Eberthella typhosus* organisms. The royal-jelly after neutralization has a bactericidal or antibiotic action on staphylococci in dilutions of 1:30 to 1:320. Claude Helleu (1956) reported that the antibacterial factor is not effective against *E. coli*. The bactericidal activity is markedly reduced when the temperature is raised to 20°C. and above or when the pH is shifted towards alkalinity. It is practically completely destroyed at pH 8.0. The active principle of the royal-jelly is not filterable but is found in the sediment after centrifugalization. This principle can be extracted with alcohol or acetone. The crystals obtained from this extract appear to possess germicidal properties.

The therapeutic possibilities of the royal-jelly.—(a) *Prolongation of life*:—It has been observed by feeding experiments on flies and rats, that the royal-jelly could prolong their life by 20 to 40%. It is also known that bee larvæ fed mainly on royal-jelly (queens) lived for 2 to 4 years while the larvæ denied this food survived only for a few months. Recently it has been reported that royal-jelly is exceedingly rich in pantothenic acid which vitamin is believed to be responsible for the prolongation of life in experimental animals. When pure pantothenic acid and royal-jelly can increase the virility and expectation of life in the lower animals there is every reason to think that under proper and controlled conditions of therapy, royal-jelly may prolong human life as well.

(b) *Skin diseases*:—Deficiency of pantothenic acid in food leads to dermatitis in birds, degeneration of nerve fibres in the spinal cord and depilation and graying of the hair. Pantothenic acid has been reported to possess a dermatotrophic effect extending to the skin, its appendages and mucous membranes. Pantothenic acid is present in the tissues mainly in a combined form as a component of the so-called co-enzyme, which is of vital importance in acetylation reaction. It appears that the skin has a high coenzyme requirement. Skin injuries and skin disorders immediately demand increased requirements of pantothenic acid and topical application of pantothenic acid produces favourable results in such lesions. It helps in increasing skin-resistance, promotes cicatrization, stimulates epithelialization and granulation and also helps in the curing of resistant leg-ulcers. Facial plastic surgery cases heal excellently well with pantothenic acid ointments. Lupus erythematosus and granuloma annulare have improved on local application of pantothenic

acid and vitamin E. Herpes labialis, sun-burns, alopecia, areata, seborrhœa, have shown spectacular results under pantothenic acid treatment. Royal-jelly may be used in the form of ointment and pomades for the above skin lesions.

(c) *Cosmetics*:—Due to its having a natural high content of pantothenic acid, gonadotrophic hormone-like principle and a composition similar to that of milk, royal-jelly should be a most suitable application for cosmetic purposes. It could be topically applied as a cream or snow to breasts, face and the body surface to restore natural smoothness and gloss and bring out the youthful and healthy appearance of the body and the skin.

(d) *Royal-jelly as a nutrient*:—Since royal-jelly is rich in pantothenic acid and other factors of Vitamin B complex and has a composition similar to and even richer than human milk it should be a useful nutrient material. Particularly it should be useful in old persons to improve their nutrition and longevity (Chowhan, 1957). Keeping in view the valuable properties of royal-jelly discussed above, efforts should be made to find ways and means to increase its production. A more thorough study should be launched to ascertain further therapeutic uses. This paper is intended to invite the attention of bee-farmers, pharmacutists, entomologists and therapeutists to investigate further undiscovered values of royal jelly.

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DENTAL EXTRACTION IN HÆMOPHILIA

The management of the hæmophiliac presents many difficulties, and not least among these is the problem of dental extraction. Drs. Orr and Douglas of the Glasgow University Medical College Hospital report their experiences in the management of dental extractions in patients with hæmophilia or the closely allied condition Christmas disease.

Thirty-two dental operations, involving the removal of 57 teeth, were carried out on 10 patients; nine of these were hæmophiliacs, lacking

anti-hæmophilic globulin, and the tenth was a patient with Christmas disease, lacking the Christmas factor (Biggs *et al.*, 1952). The number of dental operations performed on each patient varied from one to seven, depending on how many teeth required extraction. The patients were all admitted to hospital; they were warned that the measures to be adopted were unlikely to prevent hæmorrhage completely, but that any consequent bleeding would not be serious in its extent.

It was decided that, in general, only one or two teeth should be extracted at any one operation. When adjacent teeth were carious it was considered justifiable to extract two at one sitting. The extraction of more than two teeth resulted in much troublesome hæmorrhage. The teeth extracted were all permanent teeth; deciduous teeth do not present such a great difficulty, there being less trauma involved in the extractions. Unless there be special circumstances, deciduous teeth should be left to shed themselves in the normal manner.

To combat the additional risk of bleeding which might result from socket infection all the patients were given oral antibiotic therapy for five days, starting on the day of operation.

For each patient a protective dental splint was prepared before the operation and inserted immediately after removal of the teeth. Black guttapercha was inserted in the splint opposite the extraction site.

The purpose of the splint was to protect the soft friable clot in the socket from trauma by food or from disturbance by the tongue; a less important role of the dental splint was to hold hæmostatic dressings in position. The splint was not used for the purpose of exerting pressure on the socket. It is essential that the splint be made skilfully; a badly fitting splint is worse than no splint at all. The splint must fit accurately on the remaining teeth and remain firmly *in situ*; a loose splint causes disturbance of the poorly formed clot in the socket.

Local hæmostatic treatment consisted of an adsorbable dressing such as "calgitex" or gelatin sponge with bovine thrombin or Russell viper venom.

The application of local hæmostatic agents to the tooth sockets was of very limited value. Suturing of the gum is used in the control of hæmorrhage following tooth extraction in normal persons. It is, however, contraindicated in hæmophilia, as it provides an additional site for bleeding and may encourage hæmorrhage into the adjacent tissue spaces rather than externally.

Fresh frozen plasma was adopted as the routine form of replacement therapy for deficiency of anti-hæmophilic globulin.

The life of anti-hæmophilic globulin in blood stored at 4°C. *i.e.*, in bank blood, is very short; after three to four days only trace amounts are usually present. If plasma is collected fresh and immediately frozen to 20°C., at which temperature it is stored, there is very good preservation of the anti-hæmophilic globulin. The intravenous administration of two pints (1,140 cc.) of fresh plasma to a hæmophiliac causes a rise in anti-hæmophilic globulin content from *nil* to 5-10% of that present in normal plasma. More than half of this has disappeared by 12 hours and only trace amounts are present at 24 hours. The difficulties of the problem can readily be appreciated.

There should be no reliance on bank blood as a source of anti-hæmophilic globulin unless it has been collected within a few hours of administration.—(*British Medical Journal*, 4-5-1957).

BLINDNESS

Its Causes and the Preventive Measures
To be taken by the Public, the Profession and the State

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(Concluded from p. 124 of the Feb. '58 issue of the ANTISEPTIC)

PART III

9. *Optic neuritis* is mostly bilateral, but one eye may be affected before the other. The causes are: (a) disease of the brain and its envelopes; (b) syphilis; (c) general diseases; (d) anæmia; (e) diseases of menstruation, pregnancy and lactation; (f) lead-poisoning; (g) heredity and (h) orbital and peri-orbital affections.

Optic neuritis most often occurs in brain tumours and is of the choked-disc type, there being marked swelling of the disc known as papilloedema. Meningitis either syphilitic or tuberculous, frequently causes optic neuritis. Brain abscess and hydrocephalus may also cause it. The signs and symptoms are the same as mentioned under the same heading in the diseases of infancy and childhood and the treatment consists in tackling the ætiological factors mentioned above.

10. *Retrobulbar neuritis*:—This involves the orbital portion of the optic nerve; there are few or no changes at all in the optic disc, unless it progresses to atrophy. In most cases, there is only involvement of the papillo-macular fibres of the optic nerve, giving rise to a central scotoma. This form of neuritis may be acute or chronic. The acute form is rather uncommon and is generally unilateral, occasionally bilateral. The symptoms are neuralgia or headache on the same side, pain in and about the orbit, aggravated by movements of the eyeballs and tenderness on pressing the eye backwards. There is rapid impairment of sight, progressing quickly to partial or even complete blindness, while the external appearance of the eye is quite normal.

Ophthalmoscopic signs initially are *nil*; later, there is a slight haziness of the disc and swelling and sometimes, narrowing of the retinal vessels. Acute retrobulbar neuritis runs an acute course and after some time, the vision usually becomes normal or recovery may be partial leaving a central scotoma. Occasionally permanent and total blindness may also result. The most frequent ætiological factors producing the condition are exposure to cold, rheumatism, acute infectious diseases like influenza, syphilis, alcohol, and any extension of the neighbouring inflammation.

TREATMENT:—The ætiological factor is treated. Diaphoresis by the administration of pilocarpine and sodium salicylate, potassium iodide and strychnine internally is also helpful.

Chronic retrobulbar neuritis:—Otherwise known as toxic amblyopia and tobacco amblyopia is a chronic affection of the orbital portion of the optic nerve, of frequent occurrence, usually involving both eyes and due in the majority of cases to excessive indulgence in tobacco, alcohol, or both.

SYMPTOMS:—Gradual diminution occurs in the acuity of vision, with a foggy appearance of the objects looked at. The patient sees better in the dim light of the evening and the visual disturbance is more marked in bright light. The field of vision presents the normal peripheral boundary, but there is a central colour scotoma for red and green, corresponding to the distribution of the papillo-macular fibres of the optic nerve. The colour-defect is usually small, but may be extensive. Sometimes the scotoma becomes absolute, there being no perception of light over this area.

Ophthalmoscopic signs:—Mostly, there are no changes in the optic disc, or merely a slight haze is noticed with increased redness. At a later stage, there is very often temporal pallor of the optic disc. The course of the disease is slow and if poisoning by the substances continues, vision is further impaired and may be greatly reduced. If the cause is removed, there is usually gradual improvement and the sight becomes normal. But in severe cases, there is some permanent reduction in the acuteness of vision, and the relative scotoma continues to remain.

The pathological process causing the condition, consists of an interstitial neuritis of the papillo-macular fibres of the optic nerve, with subsequent degeneration of the fibres and the ganglion cells in the nuclear region.

TREATMENT:—Consists in total and permanent prohibition of tobacco in any form. Strychnine by the mouth and also potassium iodide are useful.

11. *Optic atrophy*:—May occur either as a primary affection or secondary to some other affection of the nerve or retina (post-neuritic, secondary or inflammatory atrophy). The symptoms are: reduction in the acuity of vision, concentric or irregular contraction of the field, first for colours and then for form, a diminution in the light-sense, sometimes scotomata, and colour-blindness; mostly following this order, first for green, then for red and lastly blue. The symptoms tend to progress and lead to total blindness.

ÆTIOLOGY:—Primary optic atrophy is frequently due to diseases of the spine like Tabes dorsalis. It is also common in disseminated sclerosis, general paralysis of the insane, and cerebral tumours; sometimes it may be due to syphilis, malaria, diabetes, acromegaly and nutritional disorders, especially due to deficiency of vitamin B₁ or B-complex. Secondary atrophy follows papillitis, retro-bulbar neuritis, retinitis, due to any cause, pigmentary degeneration of the retina, embolism of the

central artery of the retina and glaucoma. It results also from penetrating wounds of the optic nerve or injury to the nerve, due to fractures involving the orbit. Ophthalmoscopic signs differ slightly in the simple and post-neuritic forms. In *simple atrophy*, the disc is white or greyish, its edges are sharply defined and regular, its size is somewhat diminished and it presents a saucer-shaped excavation. The lamina cribrosa is seen very plainly. The minute vessels of the disc are not seen. The retinal vessels may appear normal but the arteries are usually diminished in calibre. In *post-neuritic atrophy*, the disc is covered by connective tissue resulting from previous neuritis. It has a dense white or greyish colour, its margins more or less irregular and obscured, the minute vessels supplying it not being seen at all, as also the lamina cribrosa, which is hidden by the organized exudation. The retinal arteries are narrow, enclosed in white lines and the veins are usually diminished in size and tortuous. In the *secondary atrophy* following retinitis pigmentosa, the disc has a dirty, greyish-red, or yellowish-waxy look, the vessels are extremely narrow and may even disappear entirely. At a certain stage, the differences in the appearance of simple and post-neuritic optic atrophy become less marked. The pathological process causing the condition, consists of an increase in the interstitial connective tissue with the atrophy of the nerve fibres. Simple, primary atrophy generally progresses to absolute blindness. In secondary atrophy, the prognosis is better, depending on how much sight has been destroyed by the antecedent inflammation.

TREATMENT is directed to the ætiological factors of post-neuritic atrophy. Potassium iodide and strychnine internally, Vitamin B₁, injections and multi-vitamin therapy are important items in treatment.

12. *Embolism of the central artery of the retina*:—Sudden or very rapidly occurring blindness, beginning at the periphery of the field, and advancing towards the centre, is the only symptom experienced by the patient. Immediately after the attack, the ophthalmoscope shows a marked pallor of the optic disc, while the artery and its branches are empty of blood, and resembling fine threads; and the veins are diminished in size towards the disc, but to a certain extent increased in size peripherally. Pressure on the eye-ball produces no pulsation or change in the calibre of the vessels, as in a sound eye. Usually a few days later, the central region of the retina begins to assume a greyish-white appearance, consequent on œdema of the nerve-fibre layer, in the midst of which the macula lutea is seen as a cherry-red spot. Minute hæmorrhages, most commonly between the macula and the disc, may be seen. The œdema of the retina passes away in a few weeks, as also the peculiar appearance of the macula-lutea, while atrophy of the retina and optic disc follow. Embolism of only a branch of the central artery is sometimes

seen. In these cases, the infiltration and defect of vision are confined to the part of the retina affected. Vision improves for a time in the initial stages, but diminishes later considerably due to atrophy of the retina and optic disc and finally even perception of light is lost.

ÆTIOLOGY:—The most common ætiological factors are endocarditis, mitral valvular disease, atheroma of the large arteries of the body, aneurysm of the aorta, pregnancy and nephritis.

TREATMENT:—Of the systemic affection of the cardiovascular system and by the parenteral and oral routes as well as retrobulbar injections of the same, in the very early stages serve to restore vision to a great extent, though not quite up to the normal standard. Vitamins A and C are administered to prevent hæmorrhages and for the absorption of any hæmorrhage already present.

C. Senility.—1. *Cataract*:—Is a disease of advanced life and gradually diminishing vision due to structural changes occurring in the crystalline lens of the eye, leading to formation of cataract. It is found in a large number of persons over 45, perhaps to a greater extent in India and certain other countries. Most probably climatic, nutritional and metabolic factors play an important role in the formation of cataracts. Much research is necessary to determine the exact ætiological and predisposing factors leading to its formation and to find suitable remedies which would prevent its formation and produce a resolution of the lenticular opacities even in the early stages of cataract-formation. In many cases, cataractous changes occur in both eyes simultaneously, without progressing to early maturity and fitness for operation, but reducing the vision to such an extent that they cannot do any work. Most cases do not manifest any refractive errors which may be corrected by glasses, except a very few cases of lenticular myopia in whom concave lenses improve vision to a certain extent only for sometime in the early stages of cataract-formation. Senile cataracts may be cortical when the opacities lie immediately under the capsule, or nuclear, when the opacity is in that part of the cortex, which is immediately around the nucleus.

SYMPTOMS:—There is diminished acuity of vision, depending on the situation and the kind of cataract. It is most marked when the opacity is central and diffuse, and less so, when the cataractous change is peripheral. When central changes predominate, the person sees best in dim light on account of the dilatation of the pupil, but with the progress of the cataract, the vision diminishes gradually until finally it is reduced to a mere perception of light and in some cases hand movements also. Diplopia or polyopia is present, due to irregular refraction of the cataractous lens.

Signs:—Oblique illumination shows a greyish or white opacity on a black ground, and with the ophthalmoscope at a

distance, a black opacity on a red field. Both eyes are usually involved in senile cataractous changes, generally one in advance of the other. Senile cataract involves the cortex, the nucleus remaining transparent throughout the process. The opacity begins either in the superficial part of the cortex (cortical) or in the central part of the cortex, surrounding the nucleus (nuclear). The time required for the full development varies widely from a few months to many years. There are again cases, in which it becomes stationary at some stage of its progress.

TREATMENT:—Consists in the extraction of the lens, when the cataract has become mature, by operation either by the extracapsular method in which the cataractous lens is removed after incision of the capsule, or the intracapsular method in which the lens along with the capsule is removed. The particular method adopted will depend on the type of cataract.

2. *Primary glaucoma* without antecedent ocular disease, commonly occurs in persons of advanced age. Secondary glaucoma occurs as a result of some pre-existing disease-change in the eye, usually a cataract. Primary glaucoma may be (1) inflammatory or congestive and (2) non-inflammatory, or simple. The inflammatory variety may be acute or chronic. These variations in the clinical types of primary glaucoma are explained by the rapidity with which increase of intraocular pressure shows itself, the extent to which it rises. When the increase of tension is rapid, the inflammatory type results and when it is gradual, with the eyeball accommodating itself to a certain extent to the altered conditions without manifesting symptoms of congestion, a simple glaucoma results, which follows a chronic course.

Acute inflammatory glaucoma.—The various symptoms of this affection occur according to stages, through which it progresses, which are mainly (1) the prodromal stage; (2) the stage of active glaucoma; (3) the stage of absolute glaucoma and (4) the stage of degeneration. The prodromal stage is present in most cases, but may be absent in some. There is a diminution in the acuity of vision, and a foggy appearance of the objects. A ring of rainbow tints is seen around lights. The cornea especially at its centre, appears to be slightly clouded. Oedema of the corneal tissue causes the above symptoms. There is a feeling of dullness and slight pain in the eyes affected, as also headache. The anterior chamber is rather shallow, the pupil somewhat dilated and often oval and sluggish in reaction. The tension in the globe is increased. There may be slight circumferential corneal congestion. The symptoms last only for a short time, the eye returning to normal quickly. But in most cases there is diminution in the accommodative power of the ciliary muscle as a result of which the patient needs more powerful glasses than usual, for near vision. A rapid increase of presbyopia is indicative in many cases, of the occurrence of glaucomatous

changes in the eye. The attack may be precipitated by insomnia, worry, insufficient food, indigestion or the local use of atropine in the eye, which is always dangerous as it precipitates a very acute form of glaucoma in persons subject to glaucomatous changes in the eye. The disease then passes to the second stage, *i.e.*, the stage of acute glaucoma, the sudden onset of which is characterized by a rapid failure of sight, contraction of the visual field, especially on the nasal side, and severe pain in the eye radiating along the branches of the fifth nerve and causing violent headache. The pain is sometimes so severe that it causes nausea, vomiting, general depression and febrile disturbances.

Objective examination reveals a marked increase in tension. The cornea is clouded, due to oedema. There is marked circumcorneal congestion of a dark red colour. The episcleral veins are prominent. The pupil is dilated, oval, immobile and often presents a greenish reflex. The iris is congested, discoloured, and dull. The anterior chamber is shallow, the aqueous sometimes turbid. The lens and the periphery of the iris are pushed forward. The lids are swollen. The ocular conjunctiva is markedly congested and chemotic. The fundus is not visible, on account of the clouding of the media. The symptoms subside after some time but again manifest themselves after a varying time not exceeding a few weeks; this recurs again and again each attack causing further reduction in sight. After some time, the increased tension in the eye causes excavation of the optic nerve disc, which can be seen with the ophthalmoscope in the intervals between attacks, when the media are clear. The lamina cribrosa, the portion of the sclera perforated by the optic nerve fibres, is most yielding and hence bulges backward with the fibres of the nerve. A deep depression is seen in the disc, with very steep or overhanging margins. This is known as the glaucomatous cupping of the optic disc. The blood vessels bend sharply over the margins of the cup and appear interrupted at this position, being again seen more or less faintly at the bottom of the depression. They are pushed over towards the nasal side. The veins are distended and arteries contracted. Pulsation is seen in the veins and arteries in the disc. Venous pulsation is commonly seen in health, but arterial pulsation is always pathological and is an important symptom of glaucoma. If the arterial pulsation does not occur spontaneously, a little pressure on the eye-ball produces the same in glaucoma. The optic nerve becomes atrophied and the disc appears pale and is often surrounded by a whitish yellow ring, due to atrophy of the choroid in this situation. With each succeeding attack of glaucoma, the acuity of vision gets more and more diminished until finally blindness results; this condition is known as absolute glaucoma. The inflammatory congestive symptoms subside and the cornea is clear or only slightly clouded in

The pupil is widely dilated, immobile and often presents a greenish reflex. The iris is atrophied. The A.C. is shallow. Tension is markedly increased. The fundus presents a picture of glaucomatous cupping of the optic disc, and atrophy of the nerve. Pain may disappear entirely in certain cases, but mostly it continues with the patient suffering from intermittent severe attacks. The stage of degeneration sets in later, when the eye-ball begins to degenerate, the cornea becoming opaque and frequently covered by vesicles. The sclera bulges and bluish-black staphylomata appear. Detachment of retina and cataractous changes in the lens take place often. The patient usually experiences subjective sensations of light. Finally, the eye-ball softens, shrinks and atrophies and phthisis bulbi results. Chronic inflammatory glaucoma, which is more common than the acute variety above described, presents symptoms, which resemble those of the acute variety but less intense and more gradual in their onset. The pain is not so intense as in the acute form. The diminution of visual acuity is more gradual, as also the progressive limitation of the field of vision on the nasal side. The ophthalmoscopic appearance is the same as in the acute forms.

In chronic simple glaucoma, the external symptoms are not markedly seen. There is no inflammatory attack or pain. The diagnosis is made by noting the increase of tension as well as by the ophthalmoscopic picture of the fundus, and by charting the visual fields with the perimeter. This form develops very gradually and it is usually after it has existed for some time that the patient becomes aware of any abnormal ocular condition. The eye appears perfectly normal to all appearances, or a slight circumcorneal congestion with slight dilation and prominence of the episcleral veins is seen. The pupil is almost of the normal size or slightly dilated and sometimes even constricted. The tension is raised moderately. After some time, glaucomatous cupping of the optic disc is seen as also optic atrophy and the circum-papillary ring of choroidal atrophy, the degree of change depending on the duration of the disease. The patient complains of intermittent symptoms of foggy vision, coloured halos around artificial lights, and diminished accommodation. The sight is lost gradually, and premature presbyopia and progressive contraction of the visual field especially on the nasal side occur. Paracentral scotomata are common and there is an enlargement of the blind spot. Central vision is lost only finally and so the patient may be able to read with the field of vision still quite limited. The course of the condition is very insidious, lasting for many years. If unchecked, it terminates in blindness.

ÆTIOLOGY AND PATHOLOGY:—As the exact cause of the primary glaucoma is still unsettled, considerable research is necessary. A hereditary tendency is also present in many cases. Arteriosclerosis and cardiac disease, chronic constipation

hypermetropic errors of refraction, which are usually present in eye balls of small size and febrile conditions like influenza in aged persons are predisposing factors. The usual pathological change, is a fibrosis of the corneo-scleral junction, which reduces the angle of the anterior chamber gradually and with a gradual increase of tension in the eye, due to defective elimination of fluid and rise of intra-ocular pressure, the iris and lens are pushed forward, the iris coming to lie in close contact with the cornea, with a shallowing of the anterior chamber, which is finally obliterated and the angle of the anterior chamber completely obstructed. There is dilatation of the pupil, due to paralysis of the sphincter iridis muscle, due to increased tension and this causes the base of the iris to be crowded into the iris angle, causing a further impediment to the exit of fluid. Recent opinion veered round to the view that it is not essentially due only to nerve. This is the result of the close association of optic glaucoma as well as the nerve atrophy found in it with signs and symptoms of diseases due to structural or functional changes in the diencephalo-hypophyseal system of the brain and the middle fossa of the skull. The marked deficiency or total lack of a para-sympathomimetic, cholinergic substance in the aqueous humour of patients subject to chronic simple glaucoma is an additional factor. The fact that it is present to a normal degree in aqueous of normal eyes as well as in other non-glaucomatous, non-inflammatory, pathological conditions of the eyes, should induce those engaged in the field of research into diseases of the eye, as well as the nervous system, to investigate this problem fully and find out the proper systemic remedies which could restore the nervous system and through it, this eye condition to the normal state, because at present, only palliative local remedies of temporary value and operative measures, are employed for the same.

TREATMENT:—Frequent instillation of eserine physostigmin salicylate drops 2 grains to an ounce into the affected eye every 2 hours, reduces the pain and causes constriction of the pupil, thereby opening up the angle of the anterior chamber in cases of acute and chronic congestive, primary glaucoma and to a less extent in chronic simple glaucoma cases. In addition, leeches may be applied to the temple in cases of acute glaucoma, as they lessen the pain very much by reducing the congestion. Frequent doses of purgative (Mag. sulph 90 grains), given twice daily for a few days help in reducing intra-ocular tension. Complete rest to the eyes from near work and protection from bright light by smoked coquilles, and correction of any errors of refraction, (usually hypermetropia is present) greatly assist in ameliorating the symptoms and promoting early cure. Sodium salicylate 20 grains is given thrice daily continuously for some days to afford relief of eye-pain and headache. Operative measures, when medical and palliative remedies do not prove effective, are broad iridectomy in acute glaucoma, and sclero-corneal trephining in chronic simple cases.

A mile away the wheat was ripening...

To the doctor came a new patient. Mrs. N., aged 22, 32 weeks pregnant.

She complained of fatigue and anorexia. Her blood pressure, pulse rate and temperature were normal. Her haemoglobin level? Only 55%.

How could it be raised to normal in two months? The doctor knew a way.

He checked her weight. It was 110 lb. He calculated the dose as 30 ml. to correct Hb and replenish body iron stores, to which was added a further 10 ml. to meet the demands of the fetus and increased blood volume. He ordered a 5 ml. injection straight away.

When Mrs. N. came a week later for the last injection, her morale had considerably improved. The doctor was not surprised. She would be very close to 100% Hb in another six weeks.

Meanwhile he was assured that iron deficiency would not recur. The injections had provided ample iron for fetal demands. Iron would be ready for haemoglobin synthesis after labour.

The harvest was in. Labour started 2 weeks early. Twin boys were born. Blood loss 16 oz. But Mrs. N. soon recovered — her iron stores were full.

The doctor had prescribed

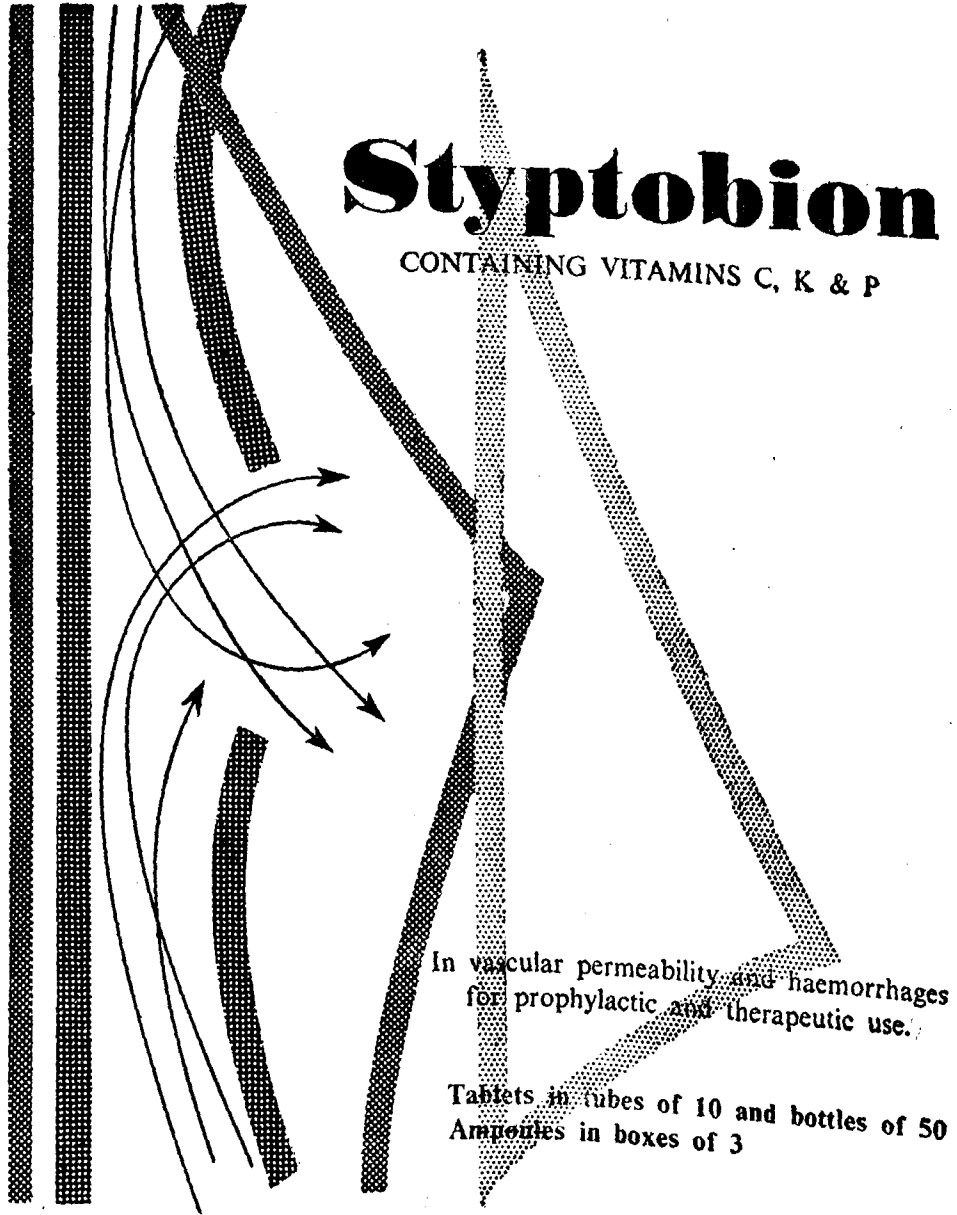
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Cases and Comments

MADELUNGS DEFORMITY

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MADELUNGS deformity is either a congenital or an infantile sub-luxation of the wrist. 'Madelungs neck', a sign present in diffuse lipomatosis, should not be confused with this deformity. Though it was originally believed to be a congenital condition, it very often occurs in infancy and later childhood.

I. The congenital type is usually unilateral; it may occur in boys and girls, but is rare.

II. The traumatic type occurs in infancy due to injury to the inferior radioulnar joint and the lower epiphysis of the radius.

III. The occupational type described by Jones and Lovett, occurs in girls; usually bilateral; the deformity is not very much pronounced; it is due to forcible rotation and twisting of the forearm and wrist in the act of wringing of wet clothes. Injury occurs to the fibrocartilaginous triangular disc in the lower radioulnar joint, the lower end of the radius coming forwards with the wrist, leaving behind the lower end of the ulna. In this variety the deformity is never marked and usually gets better with reduction, rest and immobilization.

IV. The pathological type is the commonest and occurs in girls more frequently than in boys. This is usually due to infection of the lower end of the radius with destruction and deformity partial or complete metaphysis, resulting in stunted growth and deformity of the lower end, with an anterior concavity, the articular surface almost looking forwards. The ulna grows to its usual size. The wrist is placed at right angles to the forearm.

Nutritional disorders like rickets and osteomalacia may also predispose to such deformities.

Pathological anatomy:—The lower end of the radius and the ulna are the growing ends of the forearm. The secondary centre for lower epiphysis of the radius appears in the 2nd year, and for that of the ulna in 4th year, and both join to shafts in about the 20th year. Any disease or injury to the growing end of one, results in an unequal growth and ends in deformity.

In the occupational type, there is injury to the triangular disc of fibrocartilage of the radioulnar joint, leading to dislocation. The lower end of the radius with the wrist moves forwards, leaving behind the lower end of the ulna prominently.

The common pathological variety occurs due to infection or injury to the lower end of the radius during infancy. The radius

does not grow normally, while the ulna does, projecting below and behind the wrist. The lower end of the radius is curved with the concavity forwards, and the wrist almost at right angles to the forearm. The articular surface of the lower end of the radius looks forwards.

The flexors of the wrist, thumb and digits are shortened. The extensors, and adductors of the thumb, the extensors of the wrist, and of the medial digits are displaced. They work at a mechanical disadvantage, and so do not function properly.

Supination and pronation are limited in the forearm and extension, adduction and abduction in the wrist. In the thumb the only action present is adduction, the rest being limited; finger-flexion at the metacarpophalangeal joints is normal, while that at the interphalangeal joints is affected; extension, abduction and adduction of the fingers are usually unaffected.

DIAGNOSIS:—The typical deformity present in young people with a characteristic position of the wrist, a shortened forearm and a projecting ulna is not difficult to diagnose. When there is any doubt in an atypical case with isolated signs of diaphyseal achlasia, an X-ray examination will clear the doubt.

TREATMENT:—A thorough measurement of the bones apparent, and real must be made; the integrity and function of the joints assessed; and the location and length of the muscles visualized.

Operation is advised: (a) to get over the disability, as in occupational types; (b) to restore the æsthetic appearance in cases of deformity; (c) to aim at getting the usual length of the forearm and (d) to improve the function of the forearm, wrist, hand, and fingers.

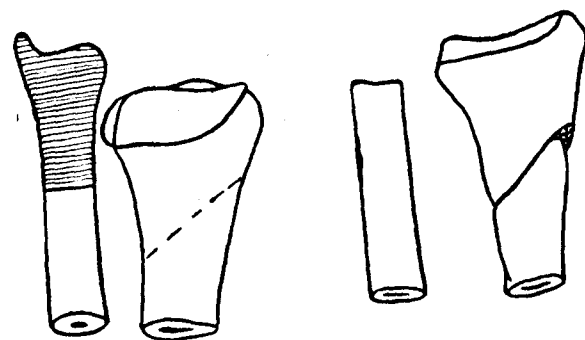


Fig. 1. Resection ulnar end and osteotomy radius.

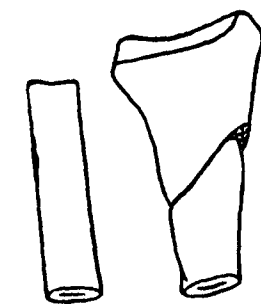


Fig. 2. Appearance after operation.

(1) Occupational deformity needs reduction and rest through plaster immobilization; (2) Henry Milch's operation may have to be done in very marked cases of the occupational type where there is destruction of the triangular disc of fibrocartilage in the inferior radioulnar joint, causing deformity. In this a fascial sling strapped round the lower end of the ulna and fixed in a drilled hole on the inner aspect of the lower end of the radius, keeping the lower end of the ulna in relation to the lower end of the radius; (3) in the infantile

type where the deformity is marked and the ulnar protrusion prominent, corrective osteotomy of the lower end of the radius, excision of the lower end of the ulna, if the head of ulna cannot be brought into position, and correction of the deformity and

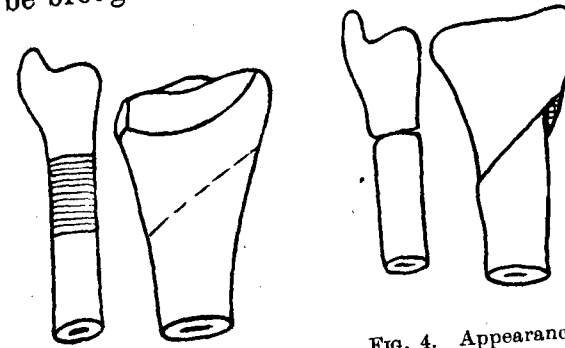


Fig. 3. Resection ulnar segment and osteotomy of radius.

Fig. 4. Appearance after operation

immobilization in plaster for four weeks, are the procedures to be adopted. Active movements of the fingers and thumb are started from the second day of operation. The oblique osteotomy must be so planned, that a soft-part interposition does not take place; the deformity can be effectively corrected and there

will not be any union between the lower fragments of the radius and ulna; (4) In cases where the ulnar protrusion is not much, a suitable length of segment of the ulna is removed and the lower end of the ulna brought into level with osteotomized and corrected lower end of the radius; (5) Usually it will be better to drive in a screw-nail or fix a silver plate and steel nails to the fragments of the radius, so that they can be kept in the corrected position, which cannot be perfectly maintained by plaster application.



Fig. 5. Showing the deformity.



Fig. 6. Showing the deformity in extension.

Case report.—M. S., an unmarried girl of 16 with deformity of the left wrist, hand and with a short forearm of 8 years' duration.

When she was an infant 8 months old, she had fever, swelling, and pain in the lower end of the left forearm. Later, it subsided forming sinuses and extruding small pieces of dead bone. Things were apparently all right for 7 years but in her 8th year started the present deformity. Gradually the wrist got bent on the forearm, the lower end of the ulna projecting below and behind the wrist. The forearm-length (hand to elbow) was shorter by two inches.

Movement in the forearm, wrist, thumb, and fingers became limited. Complete pronation and supination; extension, abduction and adduction at the wrist; all movements of the thumb except adduction, and flexion at interphalangeal joints of the fingers were limited. Pulsation of the radial artery over the anterior surface of the lower end of the radius cannot be felt.



FIG. 7. X-ray picture taken before operation.



FIG. 8. After operation with plaster.

It was considered that she might have some growth in the forearm. They wanted some correction to be made before her marriage could be thought of. Though apprehensive of further growth and development of any deformity, surgery was planned, having the future of the young unmarried girl in mind.

2-7-'57. Seconal, Largactil, Pethidine, atropine and open ether anaesthesia were administered.

The lower end of the radius was exposed through a lateral incision, care being taken to avoid injury to the radial artery, posterior interosseous nerve, and tendons of extensor pollicis longus, brevis, and abductor pollicis longus; oblique lateromedial osteotomy of the lower end of the radius from below upwards

was done; the deformity was only partially corrected, the lower end of the ulna preventing further correction, so the ulna was sectioned one inch above the lower end, and the distal fragment removed through a separate incision. The position was corrected into overextension at the wrist, care being taken not to allow interposition of soft parts between the fragments of the radius; the wounds were closed after hæmostasis and proper replacement of the tendons; and finally the limb was kept in plaster, which extended up above the elbow.



FIG. 9. After operation X-ray.



FIG. 10. After removal of the plaster.

Active movements of the fingers and thumb were started from the second post-operative day. The elbow plaster was removed after twenty one days. The other forearm plaster and the stitches were removed after four weeks. When pain was felt at the site, the forearm plaster-cast was reapplied and discharged.

The reapplied plaster was removed after another fortnight when there was no pain and she could lift small weights. She now has movements of the fingers and thumb and has regained her grip; pronation and supination are possible; she is now getting flexion, abduction and adduction at the wrist.

Though there may be some fresh growth, there is no fear of any further development of deformity, as the wrist is resting on the articular surface of the radius, and the ulna does not come into the picture. It was feared that there may be (a) nonunion from interposition of soft tissues between fragments; (b) union also with the ulna impeding pronation and supination; and (c) tension on the nerves and vessels due to the sudden lengthening of the forearm. Luckily none of these occurred.

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ICHTHYOSIS HYSTRIX

(A Case Report)

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SYNONYMS:—Linear nœvus; nœvus unilateralis (Latin: Hystrix: Hedgehog). It is a congenital condition of unknown ætiology characterized by the appearance in lines or streaks, usually unilateral, of warty excrescences, often brown or black in colour.

The condition may be noticed even at birth, but does not often attract attention until the child is 2 to 3 years old. The line or lines may be short or long and may run along the whole length of a limb. The area involved may gradually increase for some years and so it is wise to warn the parents of this possibility.

Isolated single small lesions are sometimes called congenital warts. In some cases often familial, these lesions are widely disseminated over the trunk (nœvoid keratosis) and simulate seborrhœic keratosis except for the fact that they are more fleshy and less scaly. Sometimes the patches on the trunk are distributed in transverse or curved lines, as if along the distribution of the intercostal nerves. Some cases may occur in which practically the entire body is involved more or less symmetrically (systematized nœvus).

Rarely acneform lesions or large excrescences are observed, and the nœvoid condition may involve the soft palate as well the skin of the face in rare cases.

In the rare condition known as Ichthyosis hystrix gravior (Porcupine skin disease) there is an extraordinary development of warty masses involving a large part (but never the whole) of the integument. In one family this was found to affect the males during four generations. Bullæ are sometimes a rare feature of ichthyosis.

ÆTIOLOGY:—The ætiology is not known. Montgomery (1901) concluded that the streaks probably are aligned with streaks or trends of growths of the tissues and to the adaptation of the

embryonic sutures. The unilateral arrangement of the bands and streaks—which however, is not essential as there is a group of cases in which the lesions are bilateral although not symmetrical—suggests that the affection is of nervous origin, but in many cases the lesions do not follow the lines or areas of nerves. Some suggest that Voigt's lines are the determining factor but the streaks are often irregular.

PATHOLOGY:—The individual lesions consist of a thickening of the prickle cell layer and hyperkeratosis with hypertrophy of the papillary layer. A marked feature of the mass of hyperkeratosis is the persistence of nucleated cells. The principal changes in the corium are a moderate perivascular infiltration and the presence of occasional plasma-cells or melanoblasts. The changes in the epidermis are hyperplastic and chiefly affect the corneous layer, follicles, glandular or peri-glandular structures. Groups and strands of cuboidal cells from the epidermis or glands often extend downwards into the corium. Dilation of the sweat ducts may occur.

COMPLICATIONS:—Occasionally squamous-cell carcinoma may develop in later life.

TREATMENT:—Unless they give trouble by their position, linear nœvi are best left alone. Caustics will thin them down but radical treatment should be preferred; they should be excised or destroyed by diathermy, electric cautery, or radium or carbon-dioxide snow. Excision followed if necessary by skin-grafting gives the best cosmetic results but keratosis is apt to develop in the scar.



FIG. 1.

Case report.—L. X., Hindu aged 25, came to me on 7-9-'57, for the first time to get his identification mark entered on his identity card. Of his own accord he showed the long warty band in the left lower limb extending from the medial malleolus up to the inguinal region. The band was confined only to one limb and was in a continuous single streak. The band merged at the inguinal region in a large patch of verrucous nœvus extending on the upper one-third of the left thigh and partly on the abdomen and gradually thinning down and scattering into small patches on the left side of the back. The band was 3 feet 8 inches long (see Fig. 1 above). The patient

stated that the band was present right from his birth. There was no history of this condition in any other member of his family. The condition has been stationary and does not give him any trouble.

Summary.—An interesting case of Ichthyosis hystrix is described and a brief note concerning its ætiology, pathology and treatment are also given.

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PRIMARY AND SECONDARY AMENORRHŒA

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A FEW cases of primary amenorrhœa and of secondary amenorrhœa not due to inflammation or destruction of the endometrium, are presented in this report.

Bleeding can be induced in amenorrhœic women with œstrogen alone, progesterone alone or better still with œstrogen followed by progesterone. This therapy if repeated for two or three menstrual cycles will result in spontaneous cycles, in about 30% of cases.

Determination of ovulation.—The amenorrhœic woman who desires to have children should have biweekly biopsies to find out whether or not she ovulates, which is determined by finding pro-gravid endometrium. Recording the basal body temperature may indicate not only whether ovulation occurs, or not but also the exact date on which the ovum is present. If a woman does produce ova, there is nothing to gain by trying to induce bleeding. If, on the other hand, successive biweekly biopsies reveal only a follicular or atrophic endometrium, it may be advisable to try to induce ovulation.

TREATMENT OF AMENORRHŒA:—Thyroid:—In women who do not ovulate and who have hypothyroidism, thyroid extract will yield much better results than any other hormone. Even when the thyroid function is normal, thyroid extract is found to be occasionally successful in producing ovulation.

Ethinyl œstradiol:—In some cases uterine bleeding can be brought about by administering Ethinyl œstradiol in doses of 0.05 mg. daily for 7 days, 0.01 mg. for the next seven days, and 0.15 mg. for a further period of seven days. Bleeding occurs about five days after the therapy is stopped.

Progesterone:—When endometrial biopsy and vaginal cystology reveal that intrinsic œstrogens are probably sufficient, the use of Progestines (Progesterone 10 mg. three times a day for 5 days) or orally 30 mg. three times a day for 5 days will induce progesterone-withdrawal bleeding within 24 to 96 hours in about 80% of cases.

œstrogen and progesterone:—A physiological way to induce menstruation is to prescribe both œstrogen and progesterone. A satisfactory method is the following:—

(a) Ethinyl œstradiol 0.05 mg. orally three times daily for 20 days, and (b) Progesterone 30 to 50 mg. orally for 10 days, beginning on the 14th day. That is, Ethinyl œstradiol from 1 to 14 days, ethinyl œstradiol and progesterone from the 14th to the 20th day, and progesterone alone from the 20th to the 24th day. Bleeding (if it does start) will begin a few days after treatment is stopped. This course may be repeated two or three times.

In primary amenorrhœa a simple method is to mix Oestradiol benzoate 0.5 to 1 mg. with 10 mg. of progesterone and give it intragluteally daily for five days.

In secondary amenorrhœa, 10 mg. of progesterone is given daily intragluteally for five days, making a total of 50 mg. In women with amenorrhœa of less than two years' duration, it is better to give 25 mg. of progesterone and 2.5 to 5 mg. of œstradiol benzoate in two days. Secondary amenorrhœa of longer duration requires 50 mg. of progesterone.

Pituitary preparations:—The most logical therapy for the absence of ovulation is the use of pituitary preparations which contain luteinising hormones—Equine gonadotropin 1500 i. u. given every second day 3 times. This therapy can also be given for oligomenorrhœa, and amenorrhœa of short duration in young women.

In women over 30 years of age, and in amenorrhœa of long duration, 3000 units of gonadotropic hormones and the same doses of chorion gonadotropin are used. The first menstrual period appears 2 weeks after the first injection of the chorionic gonadotropic hormone.

Present series.—In my present series, ten cases of amenorrhœa of 2 to 5 years' duration and 30 cases of hypomenorrhœa were treated with Estroprogyn (Unichem).

Age-group 10 to 38:—Most of them were above the normal weight, height and appearance, and were obese. A general examination of the heart and lungs revealed no abnormality. Blood examination in a few cases, showed secondary anæmia,

The usual history was menstrual cycle once in 21 to 45 days, very scanty discharge, lasting sometimes only for an hour or two, not even a day and dysmenorrhœa in about 50% of cases.

Bimanual vaginal examination revealed a small conical cervix, acutely anti-flexed, or a retroverted uterus.

TREATMENT AND RESULTS:—Daily injections of 1 cc. Estroprogyn were given for four days with Estroid T by mouth and bleeding occurred in 10 days.

The injections were repeated on the 20th and 24th day following bleeding, and the course repeated for three menstrual cycles. About 30% had regular cycles thereafter, and three conceived and carried on to full term.

One case of secondary amenorrhœa of 8 years' duration who had the treatment and was followed for three periods, had regular periods; and one who had a very bad skin condition improved after the above treatment. About a third of the cases had endometrial biopsy done before the treatment and only in two cases was the biopsy repeated after the treatment. Most of them showed an anovular phase.

A few cases of Metropathia hæmorrhagica were treated with Uni-Tri-Steron, 4 of these cases improved and 2 cases failed to respond. Two cases of puberty type improved with Uni-Tri-Steron and blood transfusion.

Altogether 50 cases of secondary amenorrhœa were treated with Estroprogyn and 45 of them menstruated with the first course while and 30 of them had normal cycles.

Out of the 10 cases of metropathia hæmorrhagica treated with Uni-Tri-Steron, the results were good in five. Three improved and two cases had to be given blood transfusion in addition to hormonal treatment. The result of treatment in the two types of cases is encouraging, but the follow-up after three months was difficult.

My thanks are due to Messrs. Ganapathy & Co., Agents for Unichem Laboratories, Bombay-26, who supplied me with enough material for clinical trial.

HUMERAL SHAFT FRACTURES

Because treatment of fractures through the middle third of the humerus is controversial, Kennedy and Wyatt (*Canad. J. Surg.*, 1: 26, 1957) made a critical review of therapy in 78 unselected patients. From this they concluded that the use of a hanging cast is the method of choice, for in the 57 patients treated by this method, without traction, results were satisfactory. The incidence of 21 cases of open reduction is considered excessive and due in many cases to impatience. Injury to the radial nerve is not an indication for open reduction. Only one patient required a bone graft for nonunion.—(*J.A.M.A.*, 165: 13, November 30, 1957).

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Editorials

THE UNION HEALTH MINISTER'S UTTERANCES ON INDIA'S MANY MEDICAL AND PUBLIC HEALTH PROBLEMS

THE Union Health Minister, Mr. KARMARKAR, must have had quite a strenuous time during the three weeks from the 27th January to the 18th February 1958, addressing a number of meetings and important conferences all over the country.

Inaugurating the Andhra Pradesh Academy of Medical Sciences on the 27th January 1958 at Hyderabad, he congratulated the Andhra Pradesh Government for starting the Academy. Andhra Pradesh was one of the few States which had taken full advantage of Centrally-aided schemes to promote the cause of health.

He was sorry that some States did not participate in the schemes because of the financial burden involved. Health was a State subject, but the Centre will be prepared to extend all possible help to the States in their health schemes.

The Indian Council of Medical Research has been given a grant of Rs. 4 crores in the Second Plan for its work and that Council may find it possible to entrust some of its research to the Andhra Academy, the objects of which include promotion of research in medical and allied sciences, effecting coordination among scientific and academic societies and institutions. It was his considered opinion, which we have also always held, that research in the first instance has to take the shape of conducting surveys of diseases like tuberculosis, leprosy, etc.

"In India, cancer is detected in the mouth and the upper respiratory canal, while in the West it was largely in the abdomen. We should go into

this question. It is stated that this cancer in the mouth and the upper respiratory canal is largely due to smoking cigarettes. That is partially confirmed by the fact that very few women in India suffer from cancer."

He counselled tolerance and a true spirit of enquiry in dealing with the indigenous systems of medicine and their achievements. On the 29th January 1958, Mr. KARMARKAR addressed the 14th T. B. Workers' Conference at Madras:

[NOTE:—A report of the proceedings and discussions held during this important conference will form the subject of an Editorial in a future issue].

Declaring open the new wards at the Nellore T. B. Hospital on the 31st January 1958, the Union Health Minister wanted the Budget provision for Medical Services "doubled" in order to be able to execute all the schemes on time. Otherwise the nation will have to bear the burden of people continuing to suffer from diseases for at least another half a century.

About the proposal to start a leprosy relief centre in Nellore Mr. KARMARKAR said the Union Government will give all possible assistance if liberal-minded gentlemen came forward with munificent donations. Taking the cue, Mr. T. RAMI REDDI, father-in-law of Sri B. GOPALA REDDI, the Andhra Finance Minister, announced at the end of the function, his donation of Rs. One lakh for the proposed leprosy centre.

On the same evening (31st January 1958), Mr. KARMARKAR opened the Research Block of the Cancer Institute at Adyar, Madras constructed with the Union Government grant of Rs. one lakh, to house the section carrying out research on radio-active isotopes, tissue culture etc.

He complimented Dr. (Mrs.) MUTHULAKSHMI REDDI who was largely responsible for the establishment of this Institute; he was not in favour of the Centre taking over this Institute for various reasons. The annual report of the Institute revealed that there were now 70 beds which will be increased to 100 by May 1958. The Institute had treated nearly 4,000 cases of cancer during the year from all parts of the country and from Ceylon, Burma and Malaya. Mr. KARMARKAR explained the various steps taken by the Central Government to control the malaria, tuberculosis, leprosy and cancer. With the advance made in the treatment of tuberculosis and with the co-operation of the public and research institutions, we must be able to control the disease in the course of the next ten years. He pointed out that tobacco-chewing and smoking were said to be the cause of the high incidence of cancer among young men. Research institutions should conduct research on this subject and the causes of the disease found out. He suggested to research workers to study how far the stress and strain of modern city life was responsible for such ailments.

Opening the 112-bed Cancer Ward of the Trivandrum Medical College Hospital on 1st February 1958, Mr. KARMARKAR asked medical institutions and those in the medical profession to consider how modern medical treatment can be made available to the common man, as this is one of the biggest problems that we all have to face; an anomalous thing in the development of modern treatment is its increasing cost.

"We go on multiplying doctors, and doctors may go to villages and towns, but if the cost of treatment is beyond the resources of the common man how can we provide the benefits of modern treatment to the masses at large?"

"As modern treatment of cancer with X-ray and radium is extremely costly, it would be desirable to centralize such treatment facilities in a few special hospitals. Pathological service, which was important and an essential adjunct to the diagnosis of cancer can also be centralized in these institutions."

Speaking at a reception given to him at the Trivandrum Ayurvedic College later in the day, Mr. KARMARKAR said the only way out of the controversy between the various systems of medicine was to accept "any sound treatment, whatever the system, for any ailment."

He deplored the "fight" between Ayurvedic, modern medicine and other systems of medicine. Even Ayurveda had two divisions, Suddha Ayurveda and Integrated Ayurveda. The Government and the people were confused over this controversy.

The Minister said that for the past few years they had been attempting to draw out the best from the Ayurvedic system, and it is certain that they would succeed in their attempts to find the best means of curing ailments.

Going from Cape Comorin to the Himalayan region the Union Public Health Minister inaugurated the Second All-India Nutrition Conference at Ambala on the 15th February 1958 where he commended the multi-purpose food developed in the National Research Institute, Mysore, for school-feeding programmes in the rural areas, which are to be implemented through Community Projects and National Extension Service Blocks.

"This food can be produced on a large-scale from ground-nut cake and Bengal-gram which are abundant in the country. This food will make good, to a large extent, the present protein deficiency, which was the primary deficiency, in the diet of school-going children as well as in other sections of the people."

He rightly emphasized the need to change the food habits of the people by introducing new methods of cultivation and supplementary crops, utilizing the food available locally in such a manner as to enhance its nutritional value. The note which he struck in the course of his very lucid address in regard to the modern civilized diet-pattern was indeed quite candid and thoroughly refreshing. He said the earlier traditions of eating

habits were more conducive to health than those developed during "these days of so-called modernism," and added that the diet pattern of the last century, whether in the cities or in the villages, was much more sober on an average and more conducive to health than that of today.

We quite agree with Mr. KARMARKAR's recommendation that a study of pattern of diets in vogue in different parts of India in olden times in well-to-do families should be undertaken as such studies are likely to afford a good basis for building up a good diet-pattern.

Speaking on the 16th February at Calcutta, on the occasion of the Silver Jubilee Celebrations of the All India Institute of Hygiene and Public Health, which owes its existence largely to the generosity of the Rockefeller Foundation, and which devotes considerable attention to Industrial Medicine, Mr. KARMARKAR said:

"For any worthwhile impact to be made on the health conditions of the people, the approach to health work should be essentially preventive, the basic requirements of health in the way of a clean environment, safe water supply, and wholesome food must be brought within reach of the population at large, and health workers for giving effect to these policies, must be trained in adequate numbers."

Not only has the Institute fed the health services in the country with trained workers to take up field-work but it has also provided teachers who, with the benefit of the training received by them in the Institute, have been able to organize further training programmes in their respective areas. It is gratifying to note that the work of the Institute has all along been on practical lines and that field-work has been one of the features of the training given in the Institute.

We are glad to learn that in order to provide a still wider coverage, it is proposed to add to the curriculum of the Institute, courses in public health dentistry, refresher courses for administrative medical officers and for further expanding the training programme in health education so that suitably trained officers to run Health Education Bureaux in the States would become available in large numbers.

We would like to add our own meed of praise for the solid good work being turned out at this Institute by a devoted band of research workers.

INDUSTRIAL MEDICINE AND OCCUPATIONAL HEALTH

THE Ninth All India Conference of the Society for the Study of Industrial Medicine was inaugurated at the Madras Medical College on the 13th of February 1958 by Sri Dr. U. KRISHNA RAU, Speaker of the Madras Legislative Assembly. Mr. S. ANANTHARAMAKRISHNAN, Chairman of Messrs Simpson & Co.,

in welcoming the gathering said that modern industry had developed in India with such amazing and commendable rapidity, that labour has to make a tremendous adjustment to an entirely new kind of life. The new ways of life, the rush and hurry and the relentless machines—all these present a problem to the employee.

"They are your problems too. For all too often, failure to adjust means an accident. Or it may mean an illness brought on, although indirectly, by anxiety and tension. The family is your problem too, your opportunity, and your challenge. The potential skills of our workmen may favourably compare with the workmen of countries long accustomed to the tempo of the modern industrial world. Their situation may in some details, appear to be different, but the *essential fabric is the problem of human relations*. Modern machines are a vital necessity, but in the final analysis, in the doorway of all opportunity, "there stands, not a machine, but a man." To conserve and further the pride of our men and women workers in their work, is a challenge to all of us. And since we admit the challenge we must accept the responsibility."

Sri Dr. U. KRISHNA RAU in his inaugural address stressed the aspect of the human element in industry when he said that medicine should take into consideration the complex problems which linked the health and welfare of the workers and their families.

"Occupational medicine should form part of the equipment of every physician; and therefore, the teaching of occupational health should be at all levels. Accidents in factories were costly to the industry both on the production front and on the efficiency front. Safety-first programmes should, therefore, receive top priority; the balance between mechanization and employment must be carefully tackled in order that there may be no room for fear, mistrust, anxiety or unhappiness amongst the workers."

Industrialists must realize the great importance of these pertinent factors in industrial welfare, as their active co-operation will benefit not only themselves but also their employees. Obviously then we have to think in terms of an efficient Industrial Health Service. Dr. KRISHNA RAU's suggestion at this conference to establish Institutes of Occupational Health at the different stages of industrialization, was eminently practical from every point of view. Specialists in Industrial Medicine should possess a clear conception of how occupational medicine is to be integrated with other branches of medicine and technology. "Specialization in this branch is thus a specialization of knowledge and a specialization of aims, objectives and interest." The Institutes of Occupational Health will have to provide the requisite training to these specialists and so should be sufficiently broad-based and receive adequate recognition, support and encouragement from Governments and industrial concerns.

Referring to the Employees' State Insurance Scheme, Dr. KRISHNA RAU said that from the point of view of the actual worker, it was distinctly a step forward in the national health programme. There have no doubt been quite a number of

complications in the working of this scheme, but luckily they are being gradually solved. In the matter of providing funds the Government should not grudge to give adequate grants, as after all they are collecting money from the workers who are therefore, entitled to get the best medical facility and attention. On the relation that should subsist between the society for the study of industrial medicine and the Indian Medical Association. Dr. KRISHNA RAU considered that the former's strength and safety lay in merging with the latter. This suggestion certainly deserves to be seriously considered for adoption.

Dr. C. K. RAMACHANDAR, President of the Society, in his presidential address, said a trained industrial worker was a "national asset" and no amount of expense was too much to keep him productively useful at peak-level. He pleaded for research in industrial medicine, and also stressed the need for a statutory provision for industrial medical services. He requested Universities to permit industrial medical officers of standing to appear as private candidates for D. I. H. and M. Sc. examinations.

Dr. V. R. THAYUMANASWAMI, Director, Medical Services, who inaugurated the Scientific Session, in showing the connexion between industrial hygiene and public health activities, paid a tribute to enlightened employers, who have always been aware of the need for industrial safety measures, and have introduced these in advance of legislation by the State.

"Despite heavy tax burdens, the bigger industrial organizations in the private sector maintain more comprehensive medical and welfare services than are required by Factories' Acts. Industrial hygiene has come to be recognized as a necessary public health enterprise and as a problem for the State itself, and hence it has its place besides other divisions of public health endeavours."

Dr. M. N. GUPTA, Deputy Chief Adviser, Factories (Medical), Ministry of Labour and Employment, Government of India, then delivered the "Sir Ardeshir Memorial Lecture" on the "Changing concepts of Industrial Medicine." He said that occupational health was a subject which was capable of being studied by the methods of natural, social and applied sciences. He dwelt on the handling of occupational health problems in U.S.A. and suggested the institution of special fellowships for research in industrial health. Industry of the future with its emphasis on automation, electronic and chemical operations and nuclear energy would continue to offer challenging work for the industrial physician. He warned against any tendency for technological advances to out-distance industrial health procedures.

The value of occupational health institutes in the promotion of the health of workers in industrial establishments was empha-

sized by Prof. LEO NORO, Director of the Institute of Occupational Health in Helsinki, Finland, while speaking at a reception got up in honour of the delegates to the conference. Prof. NORO said occupational health work required specialized knowledge in many fields, in studying the relationship between work and health. They had to know the physical and mental demands of different jobs and the methods to guide a man into the right job.

"In occupational health work" said he, "we need special institutes to solve numerous problems in connection with work and health-institutes which were not hospitals but centres doing preventive work among the working population. In Finland such institutes are considered as fundamental to safeguard and promote the health of man-power."

We therefore, heartily commend for adoption the suggestion of Dr. KRISHNA RAU for the establishment of such institutes in India for the welfare of labour.

THE 9TH ALL INDIA PÆDIATRIC CONFERENCE

THE Ninth All India Pædiatric Conference was inaugurated at the Rajah of Panagal Buildings in the Andhra Medical College at Visakhapatnam by Mr. MEHDI NAWAZ JUNG, Andhra Pradesh Minister, on the 6th February 1958. Dr. U.C. CHAKRABORTHY in his presidential address stressed that every Institute of Pædiatrics established in India should have a separate and complete surgical unit. The difficulty with the present generation of surgeons is that few of them get sufficient training in pædiatric medicine, either in their under-graduate or post-graduate course, and naturally there is some shakiness in the management of surgical conditions of children not only during operation, but also during the pre-operative and post-operative phases.

Expert house surgeons who have completed their training on the general surgical side find themselves at a loss in the pædiatric surgical ward chiefly because they have not had the requisite amount of training in pædiatric medicine.

"This unfortunate condition will surely continue unless we lay due emphasis on pædiatrics in the under-graduate course of study; while in many foreign countries the under-graduate course of medical study has been increased, in our country, it is being compressed," said he, "The inevitable result is that the unfortunate student is tensely packed with a mass of facts which he emits undigested before the examiners and on emerging from the portals of the college he breathes a sigh of relief. Beginning his career practically with a sense of void, he gains knowledge slowly as he goes on with practice. In this perspective, I, therefore, view the attempt to reduce the medical course with great concern, and I only hope that quality will not be sacrificed for the sake of quantity and the rapid production of doctors."

In this context we would recall the thoroughly practical suggestions offered by Dr. SHANTHILAL SHETH last year at Vellore, when he presided over the Eighth Pædiatric Conference.

"Under-graduate students should work in the pædiatric wards for two weeks in the third year and for five weeks in each of the fourth and fifth years of their medical course and should then have two to three months' training in pædiatrics after the qualifying examination. Antenatal pædiatrics and the diseases of the new-born may be taught in the obstetric wards with the help of the pædiatrician."

We therefore, feel that instead of overloading the under-graduate with more intensive teaching and training in pædiatrics, the programme outlined above may be profitably followed.

SOME PRINCIPLES IN THE CARE OF URINARY TRACT INJURIES

Injury to the kidney may be associated with injury to other organs, which may assume priority in treatment.

Radiologic examination is mandatory when renal damage is suspected. From the history, physical signs and roentgen changes, renal injuries are classified into contusion, fracture and fragmentation.

The contused kidney will heal with conservative treatment. The patient with a fragmented kidney requires immediate operation to control bleeding. The fractured kidney is treated conservatively until symptoms and signs, such as increasing tumefaction, massive hæmaturia and severe persistent pain, warrant surgical intervention. Revaluation of the injured kidney, managed conservatively, is done in two to six months.

Most ureteral injuries occur during pelvic operations. A freshly severed ureter is re-anastomosed, either side to side or end to end, over a splint. If the injury to the ureter is low, reimplantation into the bladder can be done. If the ureteral injury is recognized late, a second surgical procedure is necessary for either ureteral ligation, anastomosis or diversion of the urine.

When the bladder is suspected, cystographic study is indicated. Surgical treatment of the ruptured bladder should be prompt to divert the urine, control bleeding and drain extravasated urine and blood.

Urethral injuries are treated mainly by means of a splinting catheter. Proper periodic dilation is necessary to prevent stricture.—(McCormick, and Kretz, *J.A.M.A.*, 164: 1180, 1957, via *Journal of the International College of Surgeons*, Nov. 1957).

INFECTED PATENT DUCTUS ARTERIOSUS WITH MASSIVE LUNG INFARCTION

The surgical treatment of patent ductus is now a well-established procedure because of the low mortality rate associated with surgical correction and the high morbidity rate associated with untreated patent ductus arteriosus. The authors present observations on a 35-year-old woman who had a patent ductus arteriosus with infection and massive infarction of the left lung. This patient was successfully treated by simultaneous division of the ductus arteriosus and pneumonectomy of the infarcted lung, a combination of therapy not previously reported.—(Cope and Ellison, *J. Thoracic Surg.*, 34: 190-195, Aug. 1957, London, via *J.A.M.A.*, 165: 13, Nov. 30, 1957).

NEWSLETTER FROM THE UNITED STATES

Some interesting new advances in diagnosis and treatment of various diseases were presented at the recent meeting of the Radiological Society of North America held in California. A new technique for detecting disorders of the pancreas was reported by H. Ludin. The procedure is called "pancreatic pneumotomography" and involves the injection of carbon dioxide gas into the spaces surrounding the pancreas. X-rays are then taken to determine the shape and size of the pancreas. Dr. Ludin used this technique on 22 patients with good results. Radiologic diagnosis was confirmed by further examinations in 20 patients. The procedure is safe, but the patients sometimes experience discomfort. The technique is particularly suitable for those patients with chronic pancreatic disease who would benefit from evaluation, but whose condition does not warrant surgical exploration.....While cures for breast cancer perhaps have not been spectacular, steady progress has been made, especially with the use of improved radiation and surgical techniques. L. H. Garland, speaking at the meeting of the Radiological Society, discussed radiologic advances in the treatment of breast cancer. Simple mastectomy in conjunction with radiation has given better results with lower mortality rates than has radical mastectomy. It is interesting to note the incidence of occurrence of breast cancer and what groups are most vulnerable. Cancer occurs more often in the left than in the right breast and it is reported more frequently in women who have not given birth and to those who, although they have borne children, have not breast-fed them.....A study was undertaken by E. A. Friedman to evaluate the effectiveness in the immediate postpartum period of the oxytocic hormone Pitocin as compared to the effectiveness of other uterotonic agents. Results, reported in the June issue of the *American Journal of Obstetrics and Gynaecology*, (73: 1306, 1957), show that Pitocin is the most effective of all the drugs tested in combating uterine atony, and it has the fewest number of side reactions. Pitocin is recommended by the author for prophylactic and therapeutic use in the fourth stage of labour.....R. J. Jones, speaking at the American Society for the Study of Arteriosclerosis in Chicago, reported on his experiences in treating 50 heart-disease patients with a new extract. The extract is a crude concentrate of brain tissue, called cerebroside. It proved effective for lowering cholesterol levels in 90 per cent of his patients. It accomplishes this by speeding up elimination of cholesterol through the intestines. However, it is not known whether administration of the brain extract will prevent development of atherosclerosis and heart disease.....Constipation in children can result from a variety of causes and may be accompanied by numerous uncomfortable side effects. Dioctyl sodium sulphosuccinate (Colace) has proved to be an effective wetting agent that restores normal bowel function in children with all types of constipation. Results of treatment with dioctyl sodium sulphosuccinate in 50 chronically and acutely constipated children ranging in age from 5 weeks to 14 years are reported by F. Tevetoglu in the March issue of the *Journal of Paediatrics* (50: 304, 1957). Treatment for a period of 15 days was usually sufficient except in the case of immobilized patients. Dioctyl sodium sulphosuccinate proved very effective in restoring normal, soft stools without irritating the bowel or interfering with nutrition. Most patients continued to have normal bowel function after discontinuation of treatment, but if an episode of constipation did occur, it was easily corrected by therapy for two or three days....."Silo-filler's disease" or nitrogen dioxide pneumonia, can be a fatal disease, according to R. R. Grayson reporting in the November issue of *G.P.* (16: 90, 1957). Farmers who load green fodder into silos should be made aware of the dangers involved. Fermentation of ensilage with a high nitrate content

produces the dense, brownish gas. Production of carbon dioxide by fermentation of green fodder is also dangerous. Silos should not be entered after filling for a week or ten days and good ventilation during that time is essential..... Viewing television for school-age children was generally considered a bad influence on studying and health. Extensive researching and surveys reported by P. Witty in the November issue of *Today's Health* (35: 20, 1957), have proved these beliefs to be untrue. In fact, television may even have a beneficial effect on grades and a harmless effect on health, provided parents handle the situation well. There seems to be no relationship between amount of time spent watching television and the quality of grades achieved in school, except among those children who spend an excessive amount of time televiewing. The assets of television include improvement of vocabulary and better knowledge of history, current events, science, people, and books. Libraries report an increase in reading rather than a decrease, as was expected. Emotional and nervous disorders among school-aged children are decreasing, and when a child with emotional difficulties is found to spend an excessive amount of time watching television, there is usually another factor involved such as a poor home environment.

CHEMOTHERAPY IN PROSTATIC CANCER

Klunde and Wilmanns state that the treatment of prostatic carcinoma by contrasexual hormone is based on the fact that androgens stimulate such a cancer, while oestrogens inhibit it. In giving oestrogens it is assumed that the secretion of androgens is inhibited either directly or via the anterior pituitary lobe. Testicular atrophy (or ablation) is followed by increased secretion of gonadotropins and by compensatory enlargement of the adrenal cortex. In the later stages of hormonal treatment, therefore, increased androgen from the adrenal stimulates the growth of the carcinoma again. In recent years numerous clinical investigations have been carried out on the organo-specific therapy of prostatic carcinoma with stilboestrol diphosphate. This is a phosphorylated form, readily soluble in water, and can therefore, be injected intravenously. The acid phosphatase in the carcinomatous tissue selectively splits off the phosphate groups from the stilboestrol diphosphate supplied intravenously. The senior author himself has reported on results of this treatment in 36 cases. Subjective improvement is apparent much sooner than with hormone treatment, most particularly in the rapidity with which pain disappears in patients with bony metastases. Bedridden patients, dependent on opiates, frequently become pain-free and ambulant again after only a few injections. The drug's effect on the primary tumour is evident in the investigation of symptoms associated with micturition. Endoscopic resection, however, is frequently necessary when a large obstructive tumour is present. The effect of stilboestrol diphosphate on metastases during treatment can be checked by assessing the acid and alkaline serum phosphatase. Success of treatment can be judged from a return of the acid phosphatase to normal. It has been confirmed generally that many cases that have become refractory to oestrogens may still respond to intensive therapy with phosphorylated stilboestrol. On account of the great convenience of taking simple stilboestrol by mouth, the best routine is to use the hormone under clinical and biochemical control; on obtaining evidence of relapse one should switch to phosphorylated stilboestrol. Three cases are adduced, in each of which treatment (and control) have been used for about three years, and the progress of the disease kept at bay by daily intravenous injections of stilboestrol diphosphate.—(*Brit. J. Urol.*, March 1957, via *The Medical Journal of Australia*, November 30, 1957).

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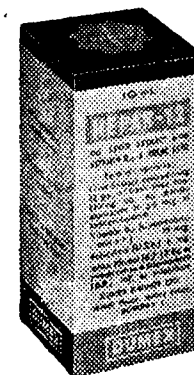
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GLEANINGS FROM THE MEDICAL PRESS

OPHTHALMOLOGY

Adenovirus eye infection.—(*Lancet*, 2: 670, 1957).

Prof. A. Macdonald and co-workers have reported an outbreak of adenovirus eye infection in Aberdeen. Most of the patients were seen by general practitioners, although 250 cases were treated in one hospital alone. Affected patients were of all ages, and often whole families were infected. It was thought likely that cross infection occurred in the hospital where treatment was given. The incubation period was estimated to be 7 to 12 days. Patients usually sought medical aid on or about the fourth day of symptoms. The earliest complaint was a feeling of grit or a foreign body in the eye. A generalized conjunctivitis rapidly developed, with mucoid discharge, some chemosis, and profuse lachrymation, especially when the cornea was involved. Large smooth follicles developed, particularly in the lower fornix. A few patients had swelling and pain in the preauricular lymph nodes. The main clinical manifestations were simple conjunctivitis, corneal infiltrates, corneal ulceration, superficial punctate keratitis, filamentary keratitis, and pseudomembranous conjunctivitis. Clinically the infections were of two types: a simple acute follicular conjunctivitis which cleared up rapidly, and a more serious condition showing corneal involvement. This occurred in 71%, and just under 50% had subepithelial infiltrates or opacities in the cornea. These were sharply circumscribed and nummular in appearance and were usually noticed about 10 to 14 days after the onset. In some patients these lesions persisted for several months.

Smears taken from infected eyes were sterile or yielded nonpathogenic organisms. The cellular exudate was predominantly mononuclear. Adenoviruses were recovered from smears with use of human embryonic kidney

epithelial cultures growing in a medium containing 2% calf serum.

Visual loss following mitral commissurotomy for mitral stenosis.—(J. E. Alfano, R. E. Fabritius and M. A. Garland, *Am. J. Ophth.*, 44: 213-216, Aug. 1957. Chicago; via *J.A.M.A.*, 165: 12, November 23, 1957).

Mitral commissurotomy for mitral stenosis, with its attendant intracardiac manipulation, has introduced another cause for arterial embolization. The authors present the histories of 2 patients in whom visual loss followed the operation of mitral commissurotomy for mitral stenosis. In each case the visual loss was thought to be due to the lodgement of a saddle embolus at the bifurcation of the middle cerebral and the posterior communicating and posterior cerebral arteries. As a result of this, the blood supply to the visual radiations was impaired. In each patient the bilateral involvement of the visual pathway produced blindness (light perception only), probably by the development of a bilateral hemianopic defect. In the second patient the embolus had lodged on the left side, with subsequent involvement of the left visual radiations, giving rise to a right hemianopic defect in the visual fields. The usual therapeutic measures consisting of vasodilators and repeated stellate ganglion blocks appear to be ineffective. The prognosis for the return of the visual field should be guarded, although visual acuity may return to normal.

SURGERY

The treatment of intractable plantar warts.—(R. Anderson, *Plast. and Reconstruct. Surg.*, 19: 384-388, May '57, Baltimore; via *J.A.M.A.*, 165: 12, Nov. 23, 1957).

Intractable plantar warts which have failed to respond to conservative therapy are probably secondary pressure phenomena rather than of virus

origin. Permanent cure requires excision of the wart and its associated callus, resection of the underlying bony prominence, and resurfacing of the soft tissue defect with pedicled plantar skin to avoid scar formation at the site of excision. These procedures were carried out 15 times in 14 patients with intractable plantar warts in the course of the past 2 years. The result has been considered good, with essentially normal and painless function, in 10 patients. There was no recurrence of wart at the site of operation in the other 4 patients, but tender areas of callus developed over adjacent weight-bearing areas. These have been controlled by conservative measures, and have not been disabling. The results to date have been superior to either bone-removal without local flap transfer or flap transfer alone. Simple excision of the skin lesion has been generally unsatisfactory. While not perfect, the use of the combined procedure has given most satisfactory results.

False diagnosis of hyperthyroidism.—
(J.A.M.A., November 23, 1957).

An analysis is made of 228 cases in which surgery had been advised elsewhere on the basis of a misdiagnosis of hyperthyroidism. The corrected diagnosis was nervous tension and exhaustion in 112 cases; menopause, 30; physical exhaustion, 27; normal, 11; colloid goiter, 11; rheumatic, endocarditis, 3; psychoneurosis, 8; hypothyroidism, 6; and miscellaneous, 20. It is believed that in the first (largest) group the most important single factor was the excessive use of coffee, tea, and tobacco; these were sometimes used in surprising amounts, sufficient to explain the nervous tension, tremor, insomnia, cardiovascular disorders, and weight loss. Determinations of basal metabolic rate gave useful information when repeated on different days with due care by experienced technicians; single determinations prove misleading. For a diagnosis of hyperthyroidism the basal metabolic rate, the protein-bound iodine test, and the radioactive iodine test should all be significant. If the two last named are not available, the

iodine test should be done, consisting of the administration of 10 drops of strong iodine solution (Lugol's solution) three times a day for 10 days. Cautions in performing and interpreting this test are noted. Thyroidectomy is not an emergency operation, and needs to be justified by complete diagnostic information.

Hyaluronidase aids in surgical operations.—
(South African Medical Journal, 13-7-1957).

Since the discovery in 1929, of a 'spreading factor' extracted from normal testicle, this material has been used for many and varied reasons. Dr. Katz reports on a hundred consecutive operations requiring dissection, at the Johannesburg Hospital.

The solution used throughout this series of cases consisted of 3 ampoules of hyaluronidase (Hyalase) dissolved in 5 cc. of sterile water. Each ampoule contained 1,500 international units, and there were therefore 900 I.U. of hyaluronidase (Hyalase) in each cc. of the prepared solution. This amount of solution proved sufficient in all the operations carried out in this series of cases, despite the fact that some of the dissections were very difficult and took over 2 hours to complete.

It was used in the following operations: Inguinal herniorrhaphies (27), maldescended testes (3), orchidectomies (2), dissection of lymph-nodes in the neck (10), in the groin (4) and in the axilla (1). Trendelenberg operations (6), thyroidectomies (11), plunging ranula (3), repair of umbilical hernia (5), breast operations (5), parotid tumours (7), hydroceles of the tunica vaginalis (6), maxillary tumour (1), exploration of popliteal space (2), suture of nerves (2), tumour of scalp (1), nephrectomy (1), lipoma of foot (1), tumour of thigh (1), neurofibroma (1).

In surgical dissections of diseased tissues, the demonstration of intervening tissue planes is often difficult and in this respect the use of hyaluronidase as an aid to dissection proved of great value. This was most noticeable in our series of herniorrhaphies and block dissections of the neck; in the latter

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particularly it was the only way in which the internal jugular vein could be saved on several occasions, because of concomitant fibrosis.

The loss of blood was less in that small veins could be separated from the surrounding fibrous tissue and clamped. On no occasion was a vessel torn by the blunt dissection and damage to tissue was considerably lessened.

In several cases it was felt that an apparently inoperable case was made operable by the use of hyaluronidase and in all cases it was felt that the operation was made simpler for the surgeon and less damaging to the patient.

It will be seen that hyaluronidase was used in several cases of chronic inflammation (tuberculosis) and in malignancies of parotid, thyroid, kidney, and breast. It aided greatly in the ease of the operation, and the time taken; it was noted that up to the present (approximately 1½ years), no differences have been seen in the healing of the wounds or in the recurrence or spread of the inflammatory processes and tumours. Its use has been of equal value in both children and adults.

Ulceration and varicose veins.—
(U.C.H. Magazine, 42: 1, November 1957).

Dr. Stanley Rivlin of the London Varicose Clinic underlines what the London Varicose Clinic believes to be important points in the treatment of varicose ulceration.

He defines a varicose ulcer as one occurring on a limb which has no other pathology except varicose veins; furthermore *once this type of ulcer is healed and the varices properly dealt with, the patient can look forward to a normal leg for the rest of his or her life.* This last point is an important one for it applies to approximately 60 per cent of all ulcerated legs. Post-thrombotic (post-phlebotic) ulcers on the other hand, accounting for 30 per cent of the leg-ulcers statistics, do not carry such a confident prognosis, for although the patient can be kept

ulcer-free it requires constant and unremitting care.

It is relatively easy to forecast whether any individual patient is a candidate for ulceration, on the basis of the size and distribution of his varices, the presence of oedema, the occurrence of superficial phlebitis and the family history. There is no doubt that any patient in whom ulceration is likely, should be strongly advised to undergo surgical treatment for his varices, and it is also true to say that even where the skin is prognostically safe, operation is of the utmost value in permanently relieving the common symptoms exemplified by aching, tiredness, irritation, swollen ankles and nocturnal calf cramp.

The surgical treatment of varicose veins requires a careful clinical examination to plan a specific operation for each individual case, instead of the present hopeful blunderbuss venous evisceration.

Ulcerated legs:—Despite the fact that 60 per cent of all ulcers are due to incompetent varices it is quite wrong to treat varicose ulcers by operation upon the veins. This should be carried out *after* the ulcer is healed as a permanent prophylaxis against future recurrence.

One of the most important steps in any operation upon internal saphenous varices lies in the performance of a true juxta-femoral ligation, that is to say *absolutely* flush at the sapheno-femoral junction. Now this procedure can be quite difficult in the most uncomplicated cases, but if you can imagine the whole groin field full of fleshy, friable, hyperæmic glands often extending down to the femoral sheath—a typical finding in the presence of chronic ulceration—then you will realize why it may often prove impossible to carry the dissection right down to the femoral vein: and the moment the ligation becomes "high" as opposed to "flush" the whole operation is completely nullified, and indeed from the patient's point of view it were better not carried out at all. It is thus far better to wait until the ulcer is healed and the glands

have disappeared before moving on to surgery.

Treatment of ulcerated legs:—Almost every patient one sees has been brought up in the strict faith that "rest" is the keystone in the arch of ulcer healing. Physiologically, "rest" does far more harm than good for, in interfering with the normal mechanism of tissue fluid interchange, it encourages oedema, the basic factor in the maintenance of almost all chronic leg ulceration. The most vulnerable of the factors involved in the maintenance of tissue fluid equilibrium is the hydrostatic pressure inside the venule, which in turn depends upon the hydrostatic pressure within the larger veins of the leg. The pressure in the leg veins in an ambulatory patient is almost utterly dependent upon the degree of active movement of the muscles, particularly the calf muscles as utilized in flexion and extension of the ankles.

Resectional therapy for pulmonary tuberculosis.—(*Jour. Mt. Sinai. Hospl., N.Y.*, July, Aug. 1956).

Today, resectional therapy is undertaken only after a varying period of drug therapy; rarely less than three months, usually from six to twelve months. Of 3,840 patients operated upon in the Veterans Administration Hospitals in the last three years, only 25 per cent had less than three months of drug therapy prior to operation. Of the three drugs, streptomycin, p-aminosalicylic acid, and isoniazid, two (usually p-aminosalicylic acid and one of the others) are administered at the beginning of therapy; the third is held in reserve for future use because bacterial resistance to the first two drugs administered may occur.

Surgical therapy for pulmonary tuberculosis is indicated when antituberculosis drug therapy has failed to arrest the disease or when collapse procedures have been unsuccessful. Except for the rare emergency, surgery should be performed for pulmonary tuberculosis only after a planned and adequate course of antituberculosis drug therapy. There is an optimal time for operation in every patient

requiring surgery. One must watch for it; it should not be missed. Every patient cannot be brought to the "target point," which is closure of cavity, stability of disease as seen on the roentgenogram, and negative cultures of sputum and gastric washings. Although operations at this "point" are accompanied by practically no complications, there are many patients who never reach this stage. They must be operated upon with open cavities, with positive sputum, sometimes with unstable lesions and bilateral disease.

In analysing the factors influencing the success of segmental resections, Murphy found that the best results were obtained in patients who had had a first course of drug therapy for at least eight months. Satisfactory results were obtained in 95 per cent of this group.

Resectional surgery is relatively safe and the results, thus far, have been excellent.

Resection is indicated in:—1. Residual cavity under a thoracoplasty, 2. Persistent cavity or recurrent cavity, 3. Blocked or filled cavity, 4. Residual nodule, 5. Bronchostenosis, 6. Bronchiectasis, 7. Destroyed lung, 8. Uncontrollable hæmoptysis, 9. Giant cavity, 10. Tuberculous empyema with bronchopleural fistula or active pulmonary disease, and 11. Tuberculoma.

Contraindications:—Extensive bilateral disease is definitely a contraindication to resection, but bilateral disease, when well localized to lobes or segments, can be excised.

Insufficient pulmonary reserve is also a contraindication to major resection.

Emphysema, especially in the older age group, may be of sufficient severity to preclude any resectional therapy. When respiratory function is so poor that resection cannot be attempted, collapse measures may still be possible.

Active endobronchial tuberculosis of the major bronchitis is a contraindication to resection. It is, however, controlled by the antituberculosis drugs and, therefore, occurs less frequently.

Cardiovascular disease of such severity that it precludes any major thoracic procedure is naturally a contraindication to operation; but a previous coronary thrombosis which has been well compensated for and which no longer causes clinical symptoms is not necessarily a contraindication to pulmonary resection, even to pneumonectomy.

Lastly, any generalized disease which would increase the hazards of a major surgical procedure would be a contraindication to excisional surgery.

MEDICINE & THERAPEUTICS

Studies on iproniazid phosphate.—Isonicotinil-isopropyl-hydrazine phosphate, *Marsilid*—(*J. Nerv. Ment. Dis.*, 124: 322-331, via *Dig. Neur. Psych.*, August '57).

Iproniazid, an anti-tuberculous drug, stimulates mental processes and also creates psychopathology. The typical reaction to the drug consists of a feeling of well-being accompanied by improved appetite, increased energy and diminution of sleep requirements. The duration of the typical reaction shows considerable variations. In some cases, it lasts as long as the drug is administered; in others it gives way to psychological manifestations of a negative nature; while in still others positive and negative responses alternate in rapid succession. Mental aberrations are diversified and are, in most cases, characterized by overactivity, insomnia, agitation and paranoid trends.

In this study, 20 debilitated tuberculous patients were treated with iproniazid for the purpose of improving their depressed physical and mental condition. Iproniazid did not produce severe psychoses in this series, a fact that could be attributed to the use of smaller doses of the drug. Doses of 4 to 6 mg. per kg. are usually needed by tuberculous patients in the active stage of treatment, but these amounts proved to be too toxic. The dosage, therefore, was decreased to 2 mg. per kg. or roughly to 150 mg. a day. Even this reduced dose produced

harmful reactions in a number of cases and required frequent re-adjustments in the course of treatment. A dose of 50 mg. a day proved to be ineffective. Of the 20 patients treated with iproniazid, 12 showed the desired responses to the drug and gained an average of 20 lbs., while the remaining 8 showed only a partial reaction or no reaction at all. Of the 12, four exhibited no untoward psychic manifestations after several months of treatment, six became behaviour-problems but could tolerate for many months, and two developed mental disorders which required immediate termination of treatment. None developed lasting psychoses. These 12 patients (60 per cent of the series) are discussed in detail. At least two patients with acute anxiety and phobic reactions became symptom-free as the result of iproniazid therapy.

The author concludes that there are certain similarities and many differences in the psychic effects of iproniazid, reserpine, lysergic acid, amphetamine and adrenochrome. From a practical point of view, iproniazid compares favourably with reserpine as regards symptomatic treatment of certain agitated neurotic states. However, *the greatest value of this drug lies in its ability to create a sustained feeling of vitality and well-being in debilitated and depressed patients.* In this respect, *the effects of iproniazid are, in the author's opinion, unsurpassed by any other drug.*

Group practice of medicine.—(Editorial Comment: *J. Am. Med. Assoc.*).

Most physicians are interested in knowing something about group practice. For those doctors who would like to find out how and why groups organize, the American Medical Association's Council on Medical Service and the American Association of Medical Clinics have prepared a second report of their joint survey of group practice which began in 1954. In this issue of the journal, starting on page 1338, is a factual study of 103 group practice organizations that is designed not only to be of general interest but to assist physicians considering group

practice. It is also intended to supply information to those already in group practice who would like to review such practice as it is being done elsewhere.

For the purposes of this particular joint survey, a group consists of four or more physicians working together in collaborative practice for more than three years, and in which practice income is pooled and earnings divided among the physicians or some pre-arranged agreement. The survey is certainly not intended to be either a guide for, or promotion of, group practice. It is simply a reflection of past and present experience and the philosophy and operation of the group practice organizations that were specifically studied.

Some of the points of information disclosed by the study include the early problems that occur after organization. The reasons why doctors join and leave groups, the distribution of group income to members, the evolutionary process of adding more general practitioners within groups, and the opportunity for research provided by group practice should prove interesting reading to all members of the medical profession.

Those in group practice stress many indirect benefits to the member physicians, and such advantages as well as certain requirements to be a member of the group are discussed in detail. For example, annual vacation time is provided for by all the groups studied, but the length of time allowed varies with the various groups; in many cases, vacation time is determined by the length of time that the physician has been associated with the group, and

even the age of the physician is a factor. Only 22% of the groups studied required their members to take time off for postgraduate study and medical meetings, but 28% of the groups expected the physician to include training and meetings during his allowed vacation time. Sick leave, life insurance, and the payment of professional dues and subscriptions were some of the other benefits disclosed. Retirement plans and death benefits, while inconsistent, are beginning to be a part of the group operation.

Probably the most unique finding of the survey is the lack of consistency in any one phase of all the many subjects covered and, furthermore, the lack of correlation between the size of the group and its age, geographical location, or the original reasons for its inception. A second phase of this survey will be completed next fall, in cooperation with the American Association of Medical Clinics and the National Association of Clinic Managers.

BOOKS RECEIVED

Stedman's Medical Dictionary—By N. B. TAYLOR and A. E. TAYLOR. Pp. xlvii+1656. Bailliere Tindall & Cox Ltd., 7 & 8, Henrietta Street, London, W.C. 2. Price: 88s.

Modern Treatment Yearbook, 1958—Edited by Sir CECIL WAKELEY, Bt., K.B.E., C.B., LL.D. M.Ch., D.Sc., F.R.C.S., F.R.S.E., F.R.S.A., F.A.C.S., F.R.A.C.S. Pp. viii 312. Published for the Medical Press, by Bailliere, Tindall & Cox., 7 & 8, Henrietta Street, London, W.C. 2. Price: 27s. 6d.

PREPARATIONS AND INVENTIONS

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CORRESPONDENCE

Condensed M.B. B.S. Course for L.M.Ps.

To The Editor, The ANTISEPTIC, Madras
Sir, Publicity is given in the Press by the Governments of Mysore and Kerala as regards measures adopted for admission of candidates for the above Course. The Government of Mysore have appointed a Selection Committee for the purpose whilst the Government of Kerala have imposed restrictions which do not seem necessary. The Composite State of Madras, the then Madras Provincial Government was the first to institute this Course after the abolition of Medical Schools in the year 1937 and concessions were given for this Course not exceeding two years but some times even limited to one year to those who had served in the World War II. The Selection Committee appointed by the Madras Government did really good service in the choice of the candidates and the Madras Medical College and the Stanley Medical College gave ample opportunities to those even outside the State in preference to their own. It is strange to find that restrictions such as passing the Intermediate Examination, so on and so forth are imposed when the candidates have been duly qualified and granted Diplomas by a Government Board of Examiners to practise the Profession of Medicine. The restrictions are, therefore, meaningless when they have to their credit a preliminary educational standard such as the

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S.S.L.C., or Matriculation, prescribed for admission. Moreover, their qualifications have statutory recognition in the respective State Medical Councils and are now recognized in the purview of the Indian Medical Council Bill of 1956. The Governments concerned will be well advised to adopt the policy of the Madras Government and not enforce fresh restrictions. All said and done, there must be a uniform policy adopted all over India and not every State left to fix its own policy to the detriment and progress of Medical education. In passing, it may be stated that the R. G. Kar Medical College, Calcutta had been giving ample opportunities for candidates all over India to gain admission until last year when the University of Calcutta, to our regret, suspended the Course.

Madras, 11-1-'58.

D. V. VENKAPPA,
President, Indian Medical
Association (Central), Madras.

A Query

Dr. Sohan Lal Maniktala, Assistant Surgeon, I/c. Civil Dispensary, Bahl, Dt. Hissar, Punjab, wants to know the advantages and disadvantages of syringes made of nylon as compared with those made of all glass. He wants to know if nylon is quite safe even when using for penicillin injections and whether it interferes with the pH value of the solution which comes in contact with its surface and also if nylon syringes can be effectively sterilized by boiling.

NEWS AND NOTES

Exhibition of Hospital Equipment

Messrs Allen & Hanburys Limited, London are participating in an exhibition of hospital equipments to be held in London at the Olympia between the 5th and 10th of May '58. In this exhibition they will demonstrate layouts for complete operation theatres and sterilizing rooms of the most modern design. Members of the Indian Medical Association are invited to visit this stand. Tickets may be obtained on application to Messrs Allen & Hanburys Limited, Bethnal Green, London, England.

Ayurvedic Pharmacopœia

An 8 member Committee has been set up by the Government of Bombay under the Chairmanship of Pandit Shiv Sharma for preparing an Ayurvedic pharmacopœia. The other members of the committee are Shri Wamanrao Vaidya (Bombay), Shri G. M. Waidya (Chanda), Shri P. B. Dhamankara (Panvel), Shri K. G. Gune (Ahmednagar), Shri K. C. Barot (Baroda), the Drugs Controller, Bombay; and the Director of Ayurved, Bombay. The committee will suggest steps to be taken to publish an Ayurvedic pharmacopœia containing a list of Ayurvedic medicines and com-

pounds and the methods of preparing them together with the true weights and measures by which they are to be prepared and containing such other material as may lead to their proper standardization. The committee will however give priority to preparations of the section relating to Asavas and Arishtas, particularly those in common use.

Radio-isotopes Unit at Bombay

Dr. R. S. Satoskar, a graduate of the Seth G. S. Medical College, Bombay, who was studying pharmacology at Sheffield University on a Glaxo Laboratory scholarship, has now returned to India. While at Sheffield, Dr. Satoskar worked on Radio-isotopes. He will now resume his appointment at the Seth G. S. Medical College and the King Edward Memorial Hospital, Bombay, where a Radio-isotopes Unit for medical purposes is in the course of construction.

L.T.M. Calcutta

The three months' course of instruction for the L. T. M. Examination which is open to medical men only, will begin from the 15th July, 1958. Application for admission in the prescribed form should reach the Director, School of Tropical Medicine, Calcutta by the 14th May, 1958.

Statement about 'Antiseptic' under Rule 8 of the Registration of Newspaper (Central) Rules 1956.

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| 6. Names and addresses of individuals who own the newspaper and partners or shareholders holding more than one per cent of the total capital. | <p>Partners "Antiseptic"</p> <table border="0"> <tr> <td>1. Dr. U. Krishna Rau</td> <td rowspan="3">} 323-24, Thambu Chetty St., Madras-1.</td> </tr> <tr> <td>2. Dr. U. Vasudeva Rau</td> </tr> <tr> <td>3. Sri U. Vyasa Rau</td> </tr> </table> | 1. Dr. U. Krishna Rau | } 323-24, Thambu Chetty St., Madras-1. | 2. Dr. U. Vasudeva Rau | 3. Sri U. Vyasa Rau |
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| 2. Dr. U. Vasudeva Rau | | | | | |
| 3. Sri U. Vyasa Rau | | | | | |

I, Dr. U. Vasudeva Rau, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Date
14th Feb. 1958

(Sd.) U. VASUDEVA RAU,
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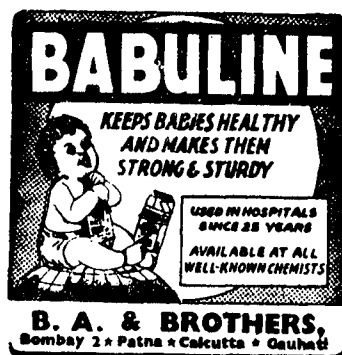
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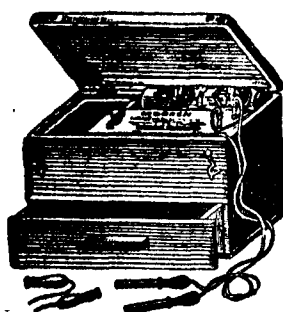
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Nicotinamide B. P.	50 mg.	
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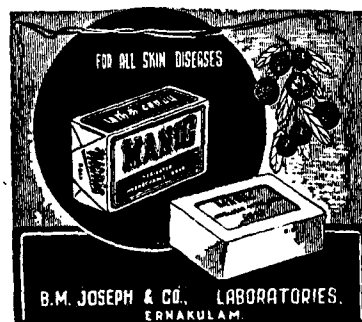
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P.A.S. 1000 21-75, 500 11-25	Hexamina tab. 100 1-00	ord. 0-87 1-37 1-75 2-50 3-50
Ephedrine Hyd. 1/2 gr 1000 4-00	Quin. Bihyd. 100 x 10gr x 2cc	Record 3-50 4-50 5-50 6-50 12-50
Riboflavin tmg 100 1-25 1000 6-75	Ind. BDH B.W.	L. Lock BD 8-75 11-50 16-75 20/36-50
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5 10USP	9-00 16-50 5gr x 1cc 100 amp	Re. 1-0 more for slide nozzle.
Liver Bja 10cc 1-12 1-50 2-12	Aminophyllin 10 cc. 50 10-50; 10 2-50	M. Case Jap 2cc 3-0 5cc 4-50
Bja Follic Acid 10cc. 2-50	Calcium Gluconate 10% 100amp	Ind. Sup 1-37 1-62 2-25 2-75 4-62
Vit. A 10A 2-82; 50A 12-00	50x10 cc Italy 10-50;	Lint 3-25; Cotton 2-00
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Forte 1-14; oral 4 oz. 2-50	with Vit C 10x5cc 11-25	3-75, 4-75, All Glass
B1 100mg 10cc 0-87 50x2cc 8-00	5x10 cc 6-25; 50x5cc 51-00	USA 6-00; Jap 2-00; B.D. 13-50
B1 & B6 10 cc. 50 mg. 9-50	Distill Water 100 amp 2cc 2-75	Thermometers 1/2 min. Hicks 3-75
B6 10cc 50mg 2-75 100mg 3-87	5cc 3-25	Zeal Eng USA Jap. Ger. Flai
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200mg 4-50; 500mg x 5cc. 5-00	Emetine 1 gr 10A 10-00	Saline app. 300 7-50 500cc 8-50
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C 2cc 10A 1-50 50A 6-00	Milk with Iodine 5 cc 100, 6-75	Ear or Glycerine Metal Syringe
C 5 cc 10 A 2-50; 50 A 10-50	Progesteron 10mg 50 10 25 10 2-50	2oz 4-50 4oz. 5-50
D2 6x1cc 1-62	10A 25 mg 5-00; 50 mg 6-00	F.L. or d 1-50 Sup. 2-75 doz.
E 6A 1-87; 10 cc. 1-75	10 cc 25 mg 2-75 10 mg 1-62	Grocodyl finish 5-75
K 10A 1-50; 100A 12-75	Liver Ext. TCF 10cc 2-50 B&C 3-37	Stethoscope B.D. 35-00; Ger 12-50
AD 6 Amp. 1-87; 10 cc 2-00	Normal Saline 100A 5cc 3-75	Wall Thermometer Jap. 3-00
AD TAB 1001-63; 1000 10-75	Santonine M&B 3-25; ox. 26-00	Rubber Gloves Sup. pair 3-00
ADE 100 6-00; 500 27-75	Redoxon 2cc 5 1-87; 50 16-75	Artery Forcep 2-25 Scissors 1-50
B-Complex 100 1-25; 1000 6-00	Redoxon 5x5cc 3-25; 25x5cc 15-50	Scalpel 1-00 Probe 0-50
forte 100 2-25 1000 12-00	Testosterone Prop. 10Amp. 1cc	Suture Needles St. C&H C6; 2-50
S. forte 100 3-00 1000 18-50	10mg 2-50; 25mg 4-00; 50mg 7-25	Scalpel Blades 6 Eng. Pkt. 2-25
B1 10 mg 100 1-37; 1000 4-75	25mg 50 12-50 50mg 50A 25-00	Handle 4-25
25 mg 100 1-75;	10cc 25 mg. 2 75; 50 mg 6-00	Tongue Depressor 1-0 folding 2-0
100 mg 6 50 50mg x 100 3-00	Aminophyllin 100 1-25; 500 4-25	Tooth Forcep Universal Sup. 5-00
C 50 mg 100 1-50; 1000 7-25	Aspirin Eng. 7 50, 1000 Ind. 5-50	Pat. Bromide 3 25, Pot. Iodide 11-50
C 100mg 100 1-75; 1000 12-00	Camoquin 250; Strp 31-00 Pkt. 0-40	Silver Protein. 1-25 Vitellina-50 oz
E 10 mg 25 1-50; 100 3-00	Calomet tab 1gr 100 1-25 1000 7-45	Aspirin 5 50 Sod Salicylas 5-87
Folic Acid 15mg 10cc 2-12	Enterovioform 20 2-00; 100 8-62	Iodoform 2 25; Iodine Cryst 1 50 oz.
Berlin 10cc 50mg 2-0; 100mg 2-50	Iron Vit. B1 100 1-25, 500 5-50	Calomet on 2 00 Menthol Cryst oz 5-50
Penicillin G Cryst. Glaxo or Dames	Cibazol 20 1-62; 250 13-50	Stethoscope Bag Plastic 1 25
0 45 0-65 1 00	Influenza tab 1000 14-0, 100 2-00	Fountain Pen Torch Lamp 3-50 Sup 5 75
0-50 0-69 1 06 Squibb	Laxative Veg. 100 1 50 1000 8-50	Ring Passary each 0 50 Vikalp 3-25
0 5 10 4	Soda Mint 1000 1-25 Boots 3-50	Empty Gelatine Capsules :-
0 45 0-65 1 00	Mepacrine 1000 15-87	00 to 2 100 1-75 1000 10-75
0 5 10 4	Folic Acid 5mg 100 4-25 TCF 9-50	Temperature Charts 4 Hour 100 2 50
0 45 0-65 1 00	Multivitamin 100 1-62 1000 10 00	Terramycin Eye oint. 1 75
0 45 0-65 1 00	Paludrin 1000 1 g 23-75 3 g 59 00	Emetin Hyd. 1/2 gr. 12 H.T. 4 25
0 45 0-65 1 00	Penicillin Tab. 1 1/2 gr. 100 1 50	Haxley's formates 4 87
0 45 0-65 1 00	Saccharin 1000 tab 2-75 500 1 62	Cardiazol 6A 2-87 Kapilin 6A
0 45 0-65 1 00	Saridon 10 1-06; 250 25 75	Benadon 2cc 50A 29 00 [3-37
0 45 0-65 1 00	Sulphanilamide Powder 5-50	40mg tab 100 15-75 [5a 3-00
0 45 0-65 1 00	M & B 693 20 1-37 500 32 50	Ephynal tab 100 mg 20 8-50
0 45 0-65 1 00	M & B 760 20 1-62; 500 26 50	Soluarsen (Acetylarsen 3cc
0 45 0-65 1 00	M & B Nivaquin 500 43-25 100 8 50	Prestigmin 250 tab 57/- [50a 23 50
0 45 0-65 1 00	M & B Sulfadiazine 500 27 0 100 5-50	Pyromidon tab 20 3gm 3-75
0 45 0-65 1 00	Sulphatriad 100 7-12; 500 34 25	Stycol 20 tab Sedophic tab 25
0 45 0-65 1 00	Santonine & Calomet 100 3-62	Juvenin Amp 10x1cc Bay. 6-00

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PHARMACOLOGY OF

Cinchona Alkaloids

The Cinchona Alkaloids—Quinine, Quinidine, Cinchonine and Cinchonidine—are mild protoplasmic poisons to which malarial plasmodia are particularly sensitive.

Quinine Salts in combination with urethane or urea Hydrochloride possess a local Anæsthetic action.

Quinine helps increase secretion of gastric juice and improves appetite.

In moderate doses, quinine is a cardiac depressant particularly in auricular fibrillation. Quinidine is superior in this respect. Both the drugs lower blood pressure. The mammalian smooth muscles contract after the use of Quinine but the skeletal muscles weaken.

Quinine and its derivatives have a general antipyretic action due to their effect on the temperature regulating centre of the brain. Quinine and other Cinchona alkaloids are easily absorbed and rapidly eliminated by the kidneys.

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QUININE

PURE SAFE AND EFFECTIVE

Mitigal

**Anti-Parasitic, Anti-Inflammatory,
Anti-Pruritic.**

in
Scabies; pediculosis. Pustular and seborrhoeic dermatitis, eczematous of various etiology, ring worm, herpes tonsurans, impetigo, favus, acne vulgaris, acne rosacea, pompholyx, etc. Also pruritus of various etiology including the senile and nervous type; prickly heat.

RELIABLE IN ACTION. CLEAN IN APPLICATION.
Bottles of 30 g. & 150 g.
Mitigal Ointment; Tubes of 10 g.



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LEVERKUSEN, GERMANY

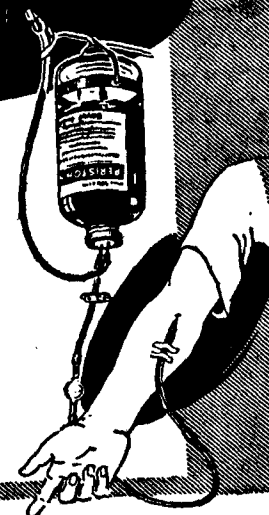
PERISTON "N"

6% polyvinylpyrrolidone
(mean molecular weight 12600)

for
RAPID DETOXICATION OF BLOOD AND TISSUE
in

diphtheria, tetanus, dysenteries, typhoid, botulism, drug-poisoning, liver diseases, epidemic dropsy, ascites, poliomyelitis, encephalitis, burns, hyperemesis gravidarum, etc. Also, as a diuretic in nephritis-nephrosis, eclampsia, etc.

Infusion bottles of 100 cc.



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P.O. BOX 1478, BOMBAY 1.

BRANCHES: P.O. BOX 8943, CALCUTTA 13. P.O. BOX 3738, MADRAS-2

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RS. A.	RS. A.	RS. A.
CHEMPHARM:—SAAR (Ger.):—	Distilled Water Ind 100 amps	Entromyeston 250mg 12cap 7-9
Calcium Pantothenate 50mg.	2cc 2-12 5cc 3-4 10cc box 4-4	Blue Pill Col. Hyosami 100 2-12
25 tabs. 1-8; 100 5-8 bot	Folic Acid 15mg 6x1cc box 2-4	Cal. Lactas Ind 5gr 1000 3-8 bot
Ethisterone B.P. 5mg	Glucose Ind 50% 25x25cc „ 5-8	Ciba's Formocibazol 20 1-10 „
25 tab 1-10; 100 4-0 „	„ „ „ 50% 50x10cc „ 7-8	Easton Syrup 1/2 dr 100 2-0 „
„ 10mg 25 2-12 100 6-8 „	„ „ „ 25% 50x10cc „ 6-4	Homoeopath Influenza 500 4-0
Folic Acid B.P. 15mg 10cc 1-14 bulb	„ „ „ 25% 25x25cc „ 3-14	Leucotropin 20 tabs Silbe 3-12
Multipar (Multivitamin)	„ „ „ 12 1/2% 50x10cc „ 5-4	Sandoz Pursennid 20 tabs 2-7 bt
25 tabs 0-11 100 tabs 1-8 bot	Liver Ext c/- B12 & Folic Acid	Sulphadiazine Ind 100 4-4 „
1000 „ 9-0 „	„ „ „ 10cc „ 2-10	„ Ind 500 18-8 1000 36-4 „
„ Forte 1000 tabs 17-0 bot	„ „ „ Italy 2USP100x2cc box 23-0	„ gunadine 500 5-14 1000 11-8
„ Super Forte 1000 tabs 24-0 „	„ „ „ c/- Folic Acid 10cc „ 2-10	„ thiazol Boots 500 13-10 bot
Nicotine „ 1-3 „	Milk with Iod Ind 50x5cc „ 3-4	„ „ Ind 500 9-8 1000 18-0
„ 3-12 100 „ 1-3 „	„ Plain „ 50x5cc „ 3-4	„ nilamide 500 3-14 1000 6-10
„ 100 3-12 100 „ 1-3 „	Multipar German 6x2cc „ 2-8	Vit C 50mg 100 1-4 1000 7-0 „
„ 100 3-12 100 „ 1-3 „	„ Ger 50x2cc 13-0 100x2cc „ 24-8	„ C 100mg 100 1-10 1000 13-0 „
„ 100 3-12 100 „ 1-3 „	„ „ „ 10cc bulb 2-0	„ B Comp 100 1-4 1000 6-8 „
„ 100 3-12 100 „ 1-3 „	Penicillin Crys G Dumex or Glaxo:	„ „ Forte 100 2-4 1000 11-8 „
„ 100 3-12 100 „ 1-3 „	2lac 5lac 10 lac	„ „ S. Forte 100 2-12 1000 15-8 „
„ 100 3-12 100 „ 1-3 „	0-7-3 0-10-3 1-0 bulb	Acid Citric 3-4 Aspirin 5-14 lb
„ 100 3-12 100 „ 1-3 „	Procain oily 30lac Belg 1-8	Barium Sulphate (X-ray) 1-10
„ 100 3-12 100 „ 1-3 „	„ „ „ 4lac Italy 0-7-6	Glucose Pow Ind 4oz pkt. 0-5
„ 100 3-12 100 „ 1-3 „	„ „ „ 4lac Pfizer 0-13 Cynamide 10-0	Mag carb levis 1-11 Pond 1b1-4
„ 100 3-12 100 „ 1-3 „	„ „ „ Procain 4lac 0-9-9 Glax 0-9-9	Mag sulph 1 lb -/6 5 lb pkt 1-8
„ 100 3-12 100 „ 1-3 „	„ „ „ Dumex or Glaxo 20lac 1-14	Soda Potas Tart 4-4 lb
„ 100 3-12 100 „ 1-3 „	„ „ „ Crysticillin Squibb 4 lac 0-11	„ Salicylas 5-12 „
„ 100 3-12 100 „ 1-3 „	„ „ „ Dicyrystein 1gm 1-15 1/2gm 1-4 ea	„ „ Natural 1 oz oz. 2-4
„ 100 3-12 100 „ 1-3 „	„ „ „ Strepto c/- Penicillin Dumex:	Syrup Ferri Iodide BP1-10 lb
„ 100 3-12 100 „ 1-3 „	„ „ „ 1gm 1-3 1gm 1-13 ea	Multivitamin drops 15cc 13-8 doz
„ 100 3-12 100 „ 1-3 „	„ „ „ Seclomycin Glaxo 1gm 1-3 „	„ Forte drops 15cc 21-0 „
„ 100 3-12 100 „ 1-3 „	„ „ „ Quinino Bihydro 10gr 12x2cc Eng 3-8	Vit B12 Liq Halewood 4oz 2-8
„ 100 3-12 100 „ 1-3 „	„ „ „ Tinct Iodine 100 4-0 50 tube 2-8	Borated Cotton Wool 1oz 0-5
„ 100 3-12 100 „ 1-3 „	„ „ „ Testosterone Propionate amps	Stethoscope BD Type 5-8
„ 100 3-12 100 „ 1-3 „	„ „ „ 6x1cc 25x1cc 50x1cc 100x1cc	„ Triple „ „ 13-8
„ 100 3-12 100 „ 1-3 „	„ „ „ 10mg 1-10 6-0 10-0 18-8 box	„ Frame „ „ 2-12
„ 100 3-12 100 „ 1-3 „	„ „ „ 25mg 2-4 7-12 15-0 28-8 „	„ Chest Piece „ „ 2-12
„ 100 3-12 100 „ 1-3 „	„ „ „ 50mg 4-4 15-8 29-0 56-8 „	„ Tubing Plastic yd 0-14
„ 100 3-12 100 „ 1-3 „	Vit B1 100mg 10cc -/13 100x2cc 14-0	„ Pouche „ „ 1-8
„ 100 3-12 100 „ 1-3 „	„ „ „ 6x2cc 1-4 50x2cc 7-8 box	Doctor's Bag „ „ 4-8
„ 100 3-12 100 „ 1-3 „	„ „ „ B12 100mic 9x1cc 2-5	Gypsona Plaster of Paris
„ 100 3-12 100 „ 1-3 „	„ „ „ 1000 mic 9x1cc 16-0	Bandage 6x3yd 2-12 3x3yds 1-14
„ 100 3-12 100 „ 1-3 „	„ „ „ 500 micro 9x1cc 9-0	Record Needles German Super
„ 100 3-12 100 „ 1-3 „	„ „ „ 100 micro 10cc 2-4 ea.	ERR/EFF 1-2 18-20 1-14
„ 100 3-12 100 „ 1-3 „	„ „ „ 200 micro 10 cc 4-4	Japan Chemical Thermometer
„ 100 3-12 100 „ 1-3 „	„ „ „ 500 micro 5 cc 4-12	220F Scale 2-0
„ 100 3-12 100 „ 1-3 „	„ „ „ 1000 micro 5 cc 8-12 „	Lactometer Ger 0-11 Zeal 3-2
„ 100 3-12 100 „ 1-3 „	Vit. B Complex 10cc bulb 1-0	Fountain Pen Parker type 1-12
„ 100 3-12 100 „ 1-3 „	„ „ „ 25 x 2cc bx. 5-8	„ „ Torch lamp comp 3-0 „
„ 100 3-12 100 „ 1-3 „	„ „ „ High formulal0cc 1-4 ea	Douche Can EI. Nacet:—
„ 100 3-12 100 „ 1-3 „	„ „ „ Super forte 10cc 2-4 „	2pts 1-4 3pts 1-8 4pts ea 1-14
„ 100 3-12 100 „ 1-3 „	Chloramphenicol c/- Dihydro	Douche Fitting Set Ind 0-5 ea
„ 100 3-12 100 „ 1-3 „	„ „ „ 250 mg. 12 caps. 5-12 bot	„ „ Rubber tube 5ft 0-6 „
„ 100 3-12 100 „ 1-3 „	„ „ „ Syrup 6-4 „	Dropping Bottle Empty:—
„ 100 3-12 100 „ 1-3 „	„ „ „ 250 mg. 12 caps 5-4 „	1/2oz 1oz 2oz 4oz
„ 100 3-12 100 „ 1-3 „	„ „ „ 250 mg. 100 caps 37-8 „	White 11-4 12-8 16-0 18-12 dz
„ 100 3-12 100 „ 1-3 „	„ „ „ Eye oint. 1-2 tube	Amber 12-0 13-8 18-0 21-0 dz.

for Rapid Results in B Aritaminosis

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FOR PARENTERAL USE

Indicated in clinical and subclinical manifestations of Vitamin B Complex deficiency associated with acute or chronic diseases. Meets increased physiological demand for B Vitamins in pregnancy and during lactation.

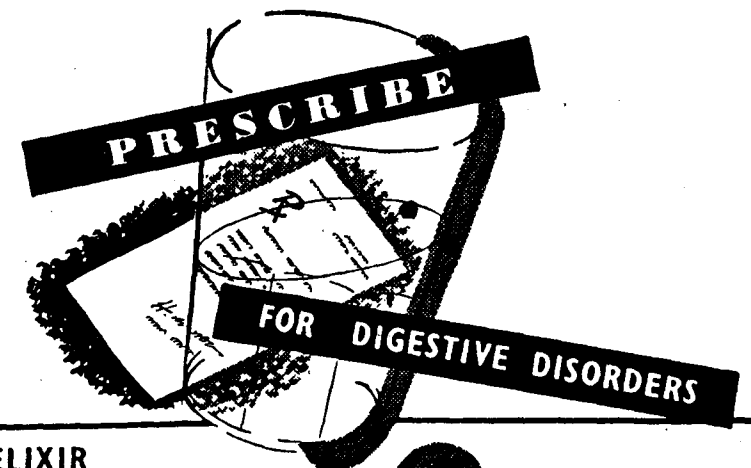
In boxes of 2 c.c. ampoules and 10 c.c. rubber-capped phials

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Vibiton
Elixir Vitamin B Complex
and
Vitamin B Complex
Tablets



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Palatable combination of
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Available in four-ounce phials

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BARDASE

3 FOLD ACTION

1 ANTISPASMODIC

Relieves Spasm

2 SEDATIVE

Relaxes Nervous Tension

3 DIGESTIVE AID

Liquefies Starch mass

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TABLET

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LIQUID BARDASE combine the anticholinergic, sedative and amylolytic properties of belladonna alkaloids, phenobarbitone and TAKA-DIASE and thus represent a comprehensive therapeutic approach.

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For the relief and management of visceral and smooth muscle spasm encountered in irritable colon, peptic ulcer, ulcerative colitis, genito-urinary disturbances and dysmenorrhoea.

PACKAGES

Tablets - Yellow sugar-coated tablets in bottles of 20 & 100; Liquid - Pleasantly flavoured liquid in bottles of 4 fl. oz.



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