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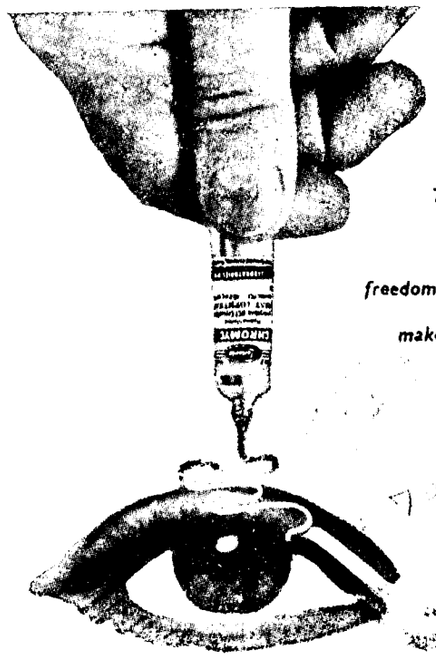

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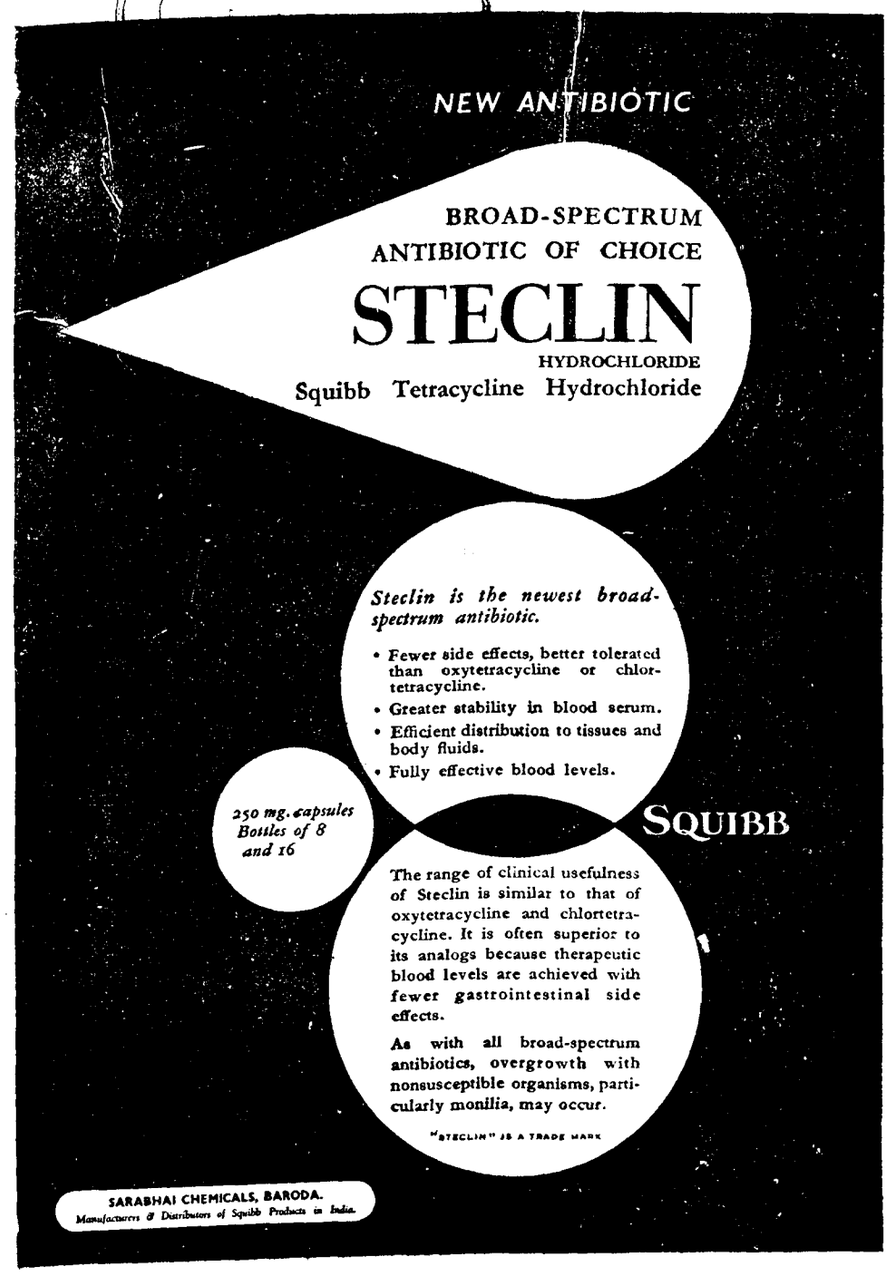

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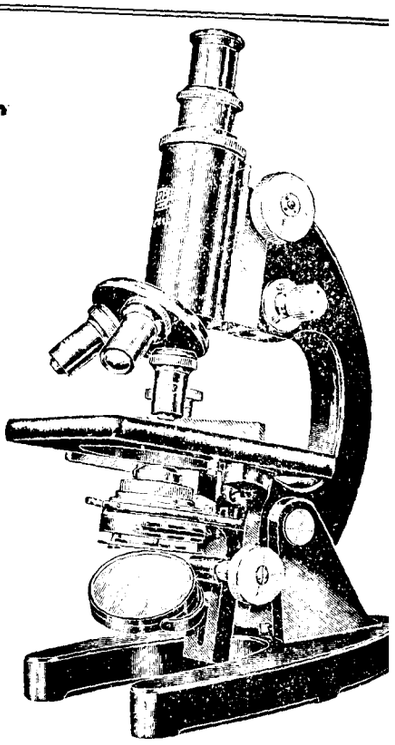

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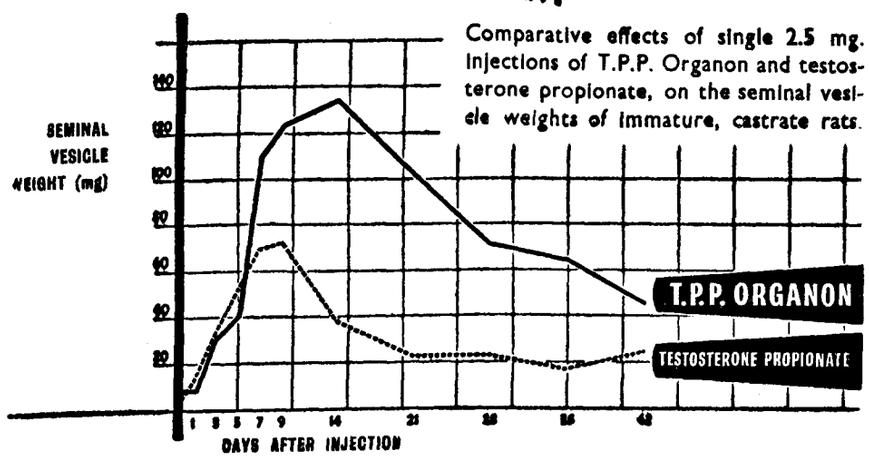

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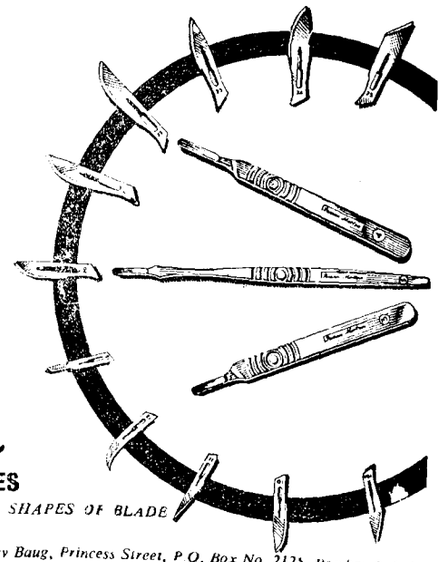

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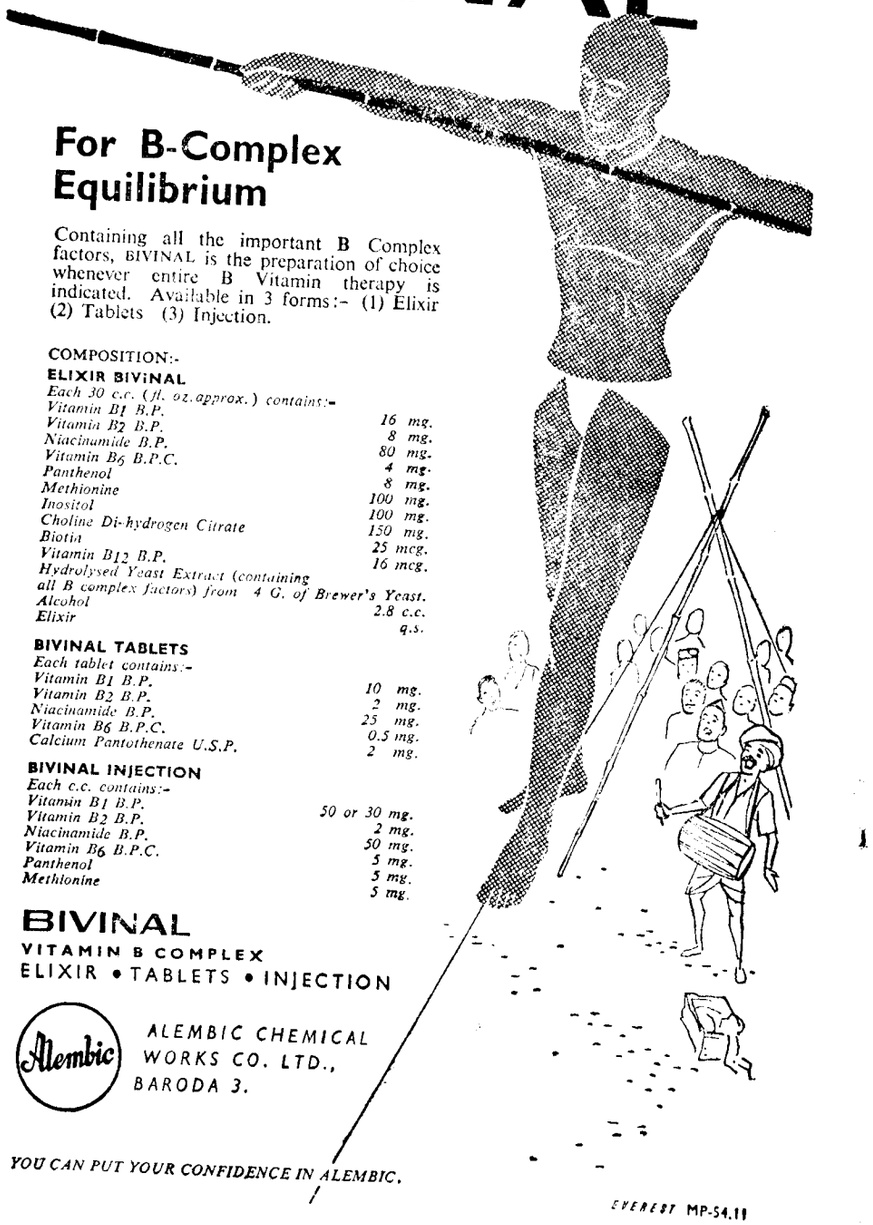

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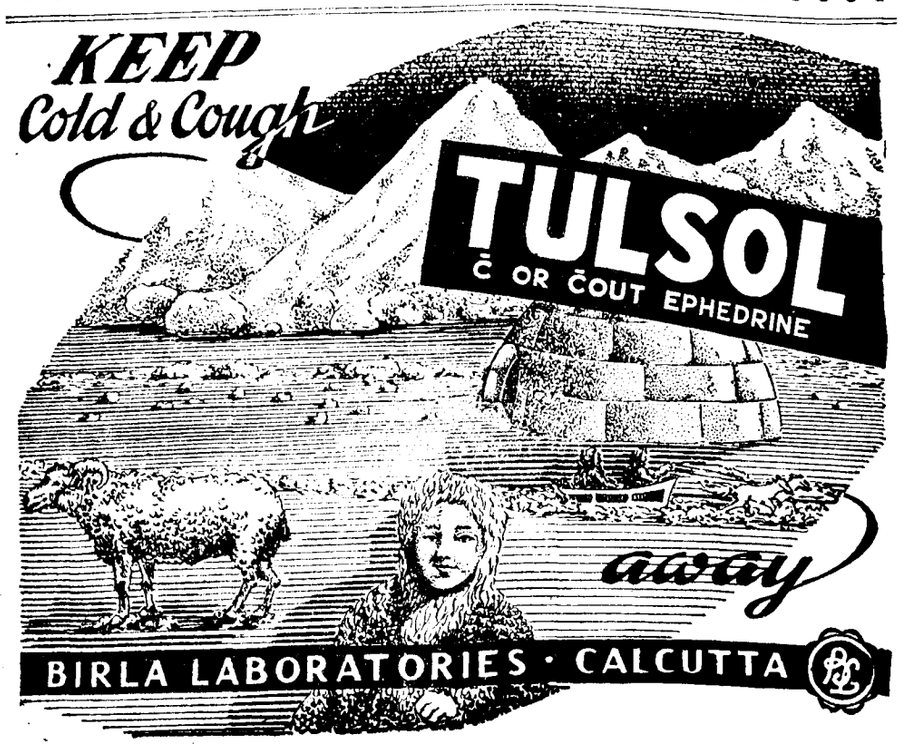

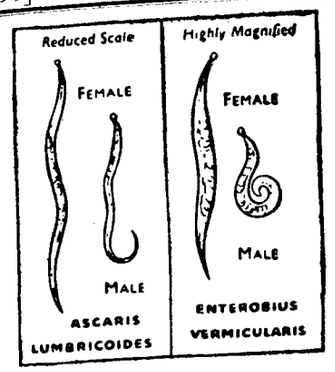

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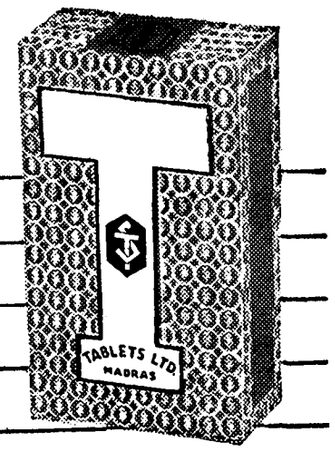

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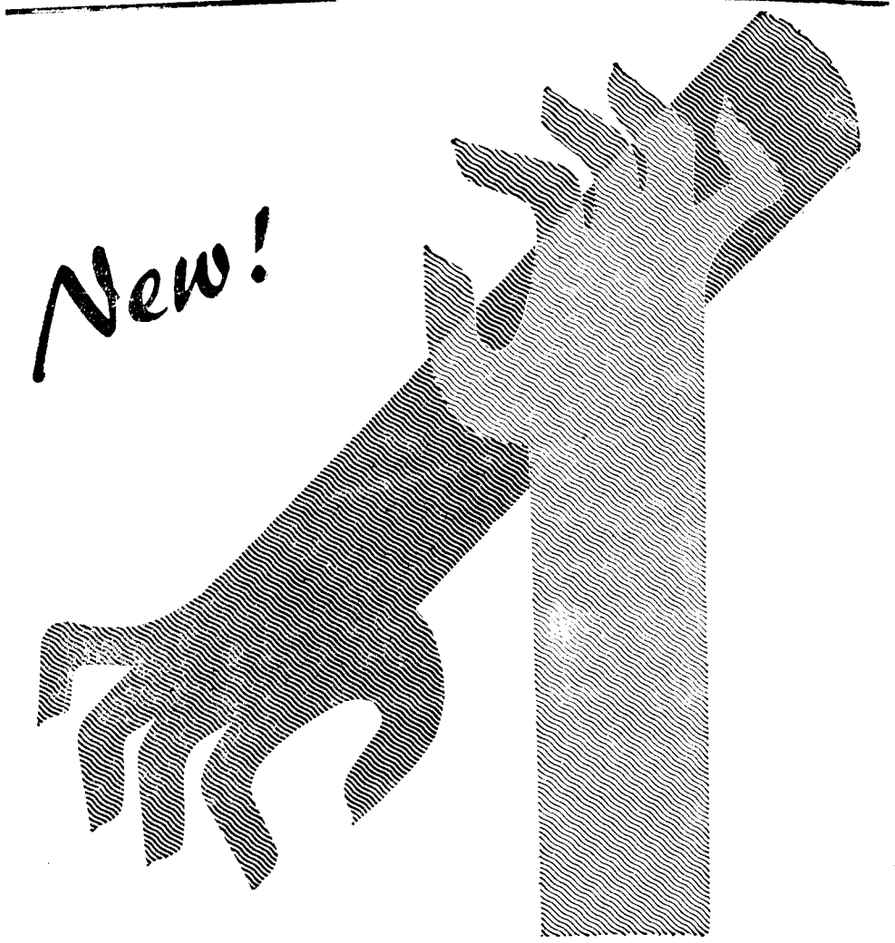

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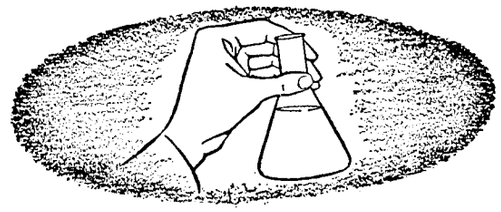

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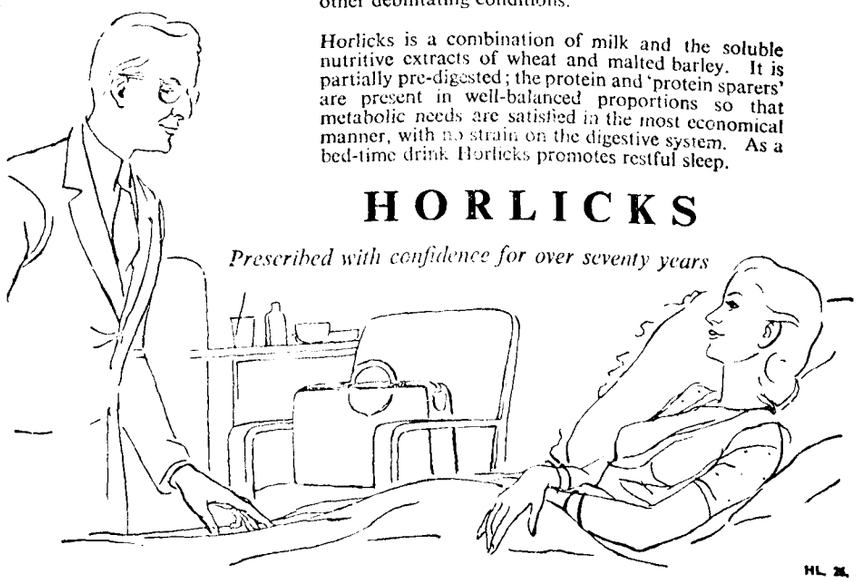

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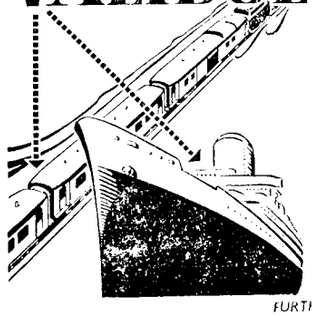

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Sodium and procaine penicillins with streptomycin. For 'mixed' infections—typically infections of the urinary tract, peritonitis, etc.

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'Lung-selective' penicillin plus streptomycin. Especially valuable in treating 'mixed' infections of the lung and respiratory tract.

CRYSTAMYCIN *Trade Mark*
Sodium penicillin, with streptomycin and dihydrostreptomycin. Use of both forms of streptomycin enables dosage of each to be halved—a marked asset in long-term therapy.

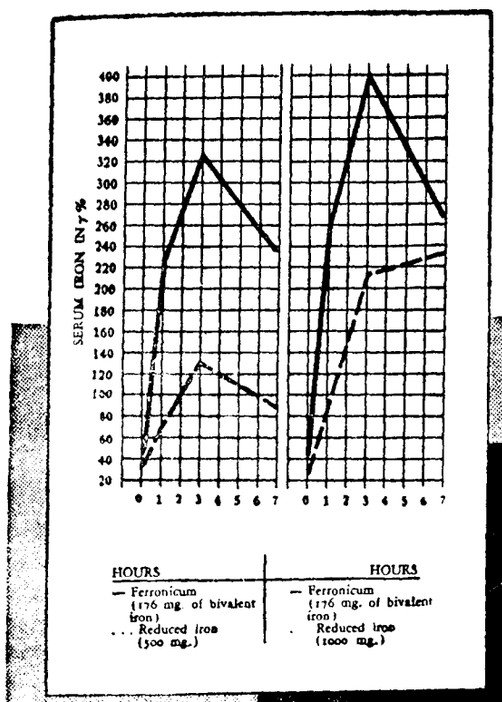
GLAXO

GLAXO LABORATORIES (INDIA) LTD. BOMBAY — CALCUTTA — MADRAS

Z. 117

In Iron Deficiency Anaemia . . .

Ferronicum



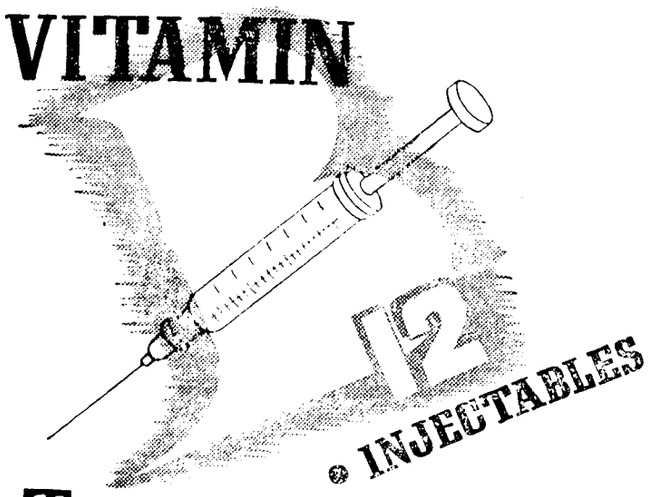
better absorbed and much better tolerated than any other oral iron preparation

The graph shows the better absorption of Ferronicum as compared to reduced iron. Small oral doses of Ferronicum increase the serum iron level far more than large doses of reduced iron (average from 5 patients), (Jasinsky, Schw. Med. Wschr., 80, 59, 1950)

SANDOZ

SANDOZ LTD., BASLE (SWITZERLAND)

VITAMIN



• INJECTABLES

PACKINGS

50 mcgm. per c.c.
10 c.c. Bulb.

100 mcgm. per c.c.
5 c.c. Bulb.
10 c.c. Bulb.

200 mcgm. per c.c.
10 c.c. Bulb.
500 mcgm. per c.c.
5 c.c. Bulb.

THE SANITEX CHEMICAL INDUSTRIES LIMITED.
INDUSTRIAL ROAD, BARODA 3. (INDIA)

New Introduction

OPIL

OPIMALT

Opimalt is a very palatable preparation in malted base of vitamins, calcium and iron which are of fundamental importance for the balanced functioning of the organism. Their therapeutic administration is desirable: (1) when their supply with food is low; (2) during periods of increased need (growth, pregnancy and lactation); and (3) when the organism is under strain (disease, allergies, overwork).

COMPOSITION: Each fl. oz. contains:

Vitamin A	...	10,000 I.U.	Choline Chloride		
Vitamin D	...	2,000 I.U.	Methionine	... 25	mg.
Vitamin B1	...	10 mg.	Inositol	... 5	mg.
Vitamin B2	...	1 mg.	Ferrous Gluconate	... 2	mg.
Vitamin B6	...	1 mg.	Calcium Glycerophosphate	... 300	mg.
Vitamin C	...	100 mg.	Calcium Gluconate	... 65	mg.
Calcium Pantothenate	...	3 mg.	Malted Base	... 130	mg.
Nicotinamide	...	30 mg.		...	q.s.

INDICATION: As a nutritious and assimilable food for children. During periods of increased need such as growth, pregnancy and diseases such as tuberculosis.

Available in bottles of 8 oz. and 16 oz.

ORIENTAL PHARMACEUTICAL INDUSTRIES LIMITED,
64-66, TULSI PIPE ROAD, : : MAHIM, BOMBAY-16

A CHOICE COMBINATION

"S.E.S.I."

Unbreakable Nylon Syringes

AND

'HELVETIA'

Finest Hypodermic Needles

We have presented the popular ***S.E.S.I*** *Nylon Syringe with the interchangeable barrels and pistons, easily sterilized.*

*We are now pleased to present "**HELVETIA,**" the Hypodermic Needle of Choice. Made of the finest stainless steel and special alloys, Record and Leur mount, packed in attractive individual plastic container. "**HELVETIA**" meets your demand for the finest in Hypodermic Needles.*

Literature from:

JUGGAT SINGH'S SON & BRO.,
Regal Cinema Building, Apollo Pier Road, BOMBAY 1

Agents for Madras & Andhra:
Messrs. UNIQUE PHARMACALS, 219, POONAMALLEE HIGH ROAD, MADRAS-7.
Calcutta: BHOOPHEE CO., 87, CHOWRINGHEE ROAD, CALCUTTA.

PENTAKOS

(Maggioni—Italy)

- For the Modern treatment of **SPASMODIC COUGHS.** (Whooping, Asthmatic Tubercular etc.) **PENTAKOS** is the medicament of choice with doctors everywhere.
- Extensive research has led to the discovery of chemical changes in the blood which cause the spasm accompanying cough.
- The Acidifying Drugs in **PENTAKOS** corrects this chemical change and eliminates the spasm.

FOR DRAMATIC RESULTS PRESCRIBE PENTAKOS.

UNSOLICITED REPORTS ON ITS HIGH EFFICACY RECEIVED FROM ALL OVER INDIA.

MANY ARTICLES PUBLISHED IN MEDICAL JOURNALS ON ITS HIGH EFFICACY.

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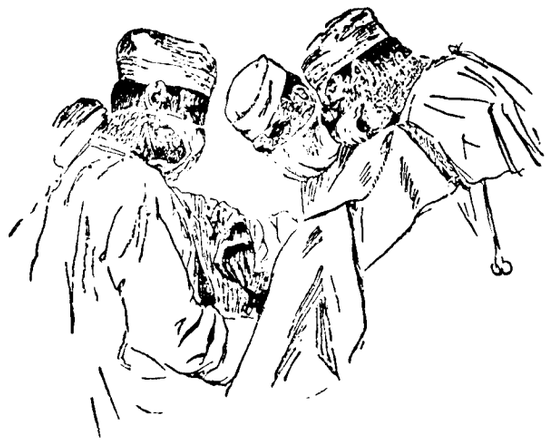
Calcutta: BHOOPEE CO., 87, CHOWRINGHEE ROAD, CALCUTTA.



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CZECHOSLOVAK MEDICAMENTS.

PELENTAN

Aethylium di-(oxycumarinyl)-aceticum 0.3 gm. per tablet.

warranting maximum efficiency and security in the dicumarol anticoagulation therapy of thrombosis, organic ailments of blood vessels, sclerosis multiplex and kindred ailme ts.

PSYCHOTON

Phenylisopropylamimum sulpuricum 0.01 gm. per tablet.

Indications :—Stimulant of the central nervous system, narcoleptic states, psychoneurosis, fatigue, apathy, obesity.

ALKIRON

4-methyl-2-thiouracil 0.05 gm. in tablet form

Indications :—Graves - Basedow disease, toxic adenomas, goitre, angina pectoris.

Representatives :

EZRA BROTHERS,
Mustafa Building, Sir Phirozshah Mehta Road,
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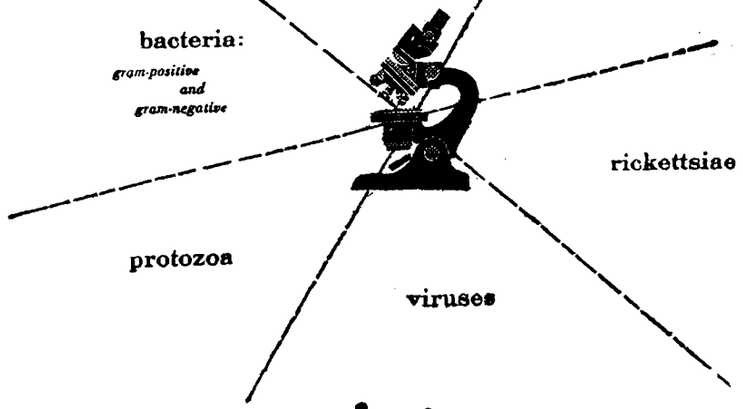
CHEMAPOL LIMITED,
Company for the Import and Export of Chemical Products and Raw Materials
PANSKA 9, PRAHA II, CZECHOSLOVAKIA

effective against them all



Terramycin
brand of oxytetracycline

broad-spectrum of anti-infective action

rapid response
well tolerated

Terramycin is supplied in a wide variety of dosage forms for systemic and topical administration.

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DEMONSTRATED

CONFIRMED

Pfizer

World's Largest Producer of Antibiotics
VITAMIN-MINERAL FORMULATIONS
HORMONES

Exclusive Distributors in India :
RAVISON PHARMACEUTICALS LTD. P. Bag No. 10020 Bombay 1. Grams : RAVIPHARM

AMPHEDRIN

Tablets

In the management of

ASTHMA

AND

HAY FEVER

Composition:

Aminophylline	[illegible]
Phenobarbital	1/6 gr.
Ephedrine Hcl	[illegible]

Manufactured by

PRIMCO LIMITED

Lamington Chambers Lamington Road [illegible]

TENSEX
TABLETS
SEX TONIC
That Invigorates and Revitalises the Entire System.
A PRODUCT OF
THE HIMALAYA DRUG CO.
BOMBAY & DEHRA DUN U.P.
MAKERS OF 'SERPINA'

Distributors for South India: THE ORIENTAL MERCANTILE AGENCY, 99-A, Armenian St., Madras-1.

O.R.C.L.'s

Caricapeptol

* for better digestion

Each fluid ounce contains:

Papain	... 24 grs.	Vitamin B_2	... 2 mg.
Diastase	... 16 grs.	Vitamin B_6	... 1 mg.
Tinct. Ipecac	... 24 mins.	Nicotinic Acid	... 20 mg.
Vitamin B_1	... 5 mg.	Alcohol	... 23% v/v.

Aromatic Oils, Glycerine, and Elixir Base Q.S.

contains vitamins

O.R.C.L. LTD.

QUMARESH HOUSE, SALKIA, HOWRAH.

For treating acute or chronic diarrhoea
AROBON

Proved highly effective for diarrhoeic and gastro-intestinal disorders amongst infants, children and adults.
Prepared from the pulp of the carob bean.
NESTLÉ'S
NESTLÉ'S PRODUCTS (INDIA), LTD.
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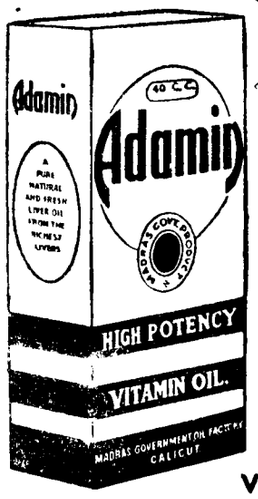
DOCTORS ARE REQUESTED TO WRITE FOR LITERATURE.
NA/G/2

Build up a Store of extra vitality and resistance against disease with

Adamin

Each Gramme contains
Vit 'A' ... 12000 I.U.
Vit 'D' ... 1000 I.U.



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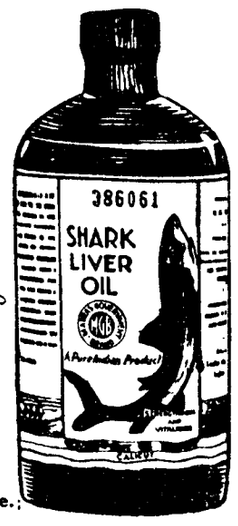
SHARK LIVER OIL



Each Gramme contains
Vit. 'A' ... 1,500 I. U.
Vit. 'D' ... 100 I. U.

No one is too young to take them.
No one is too old to benefit by them.

Products of Government Oil Factory – Kozhikode.;
A DIVISION OF THE DEPT. OF INDUSTRIES & COMMERCE,
GOVERNMENT OF MADRAS.

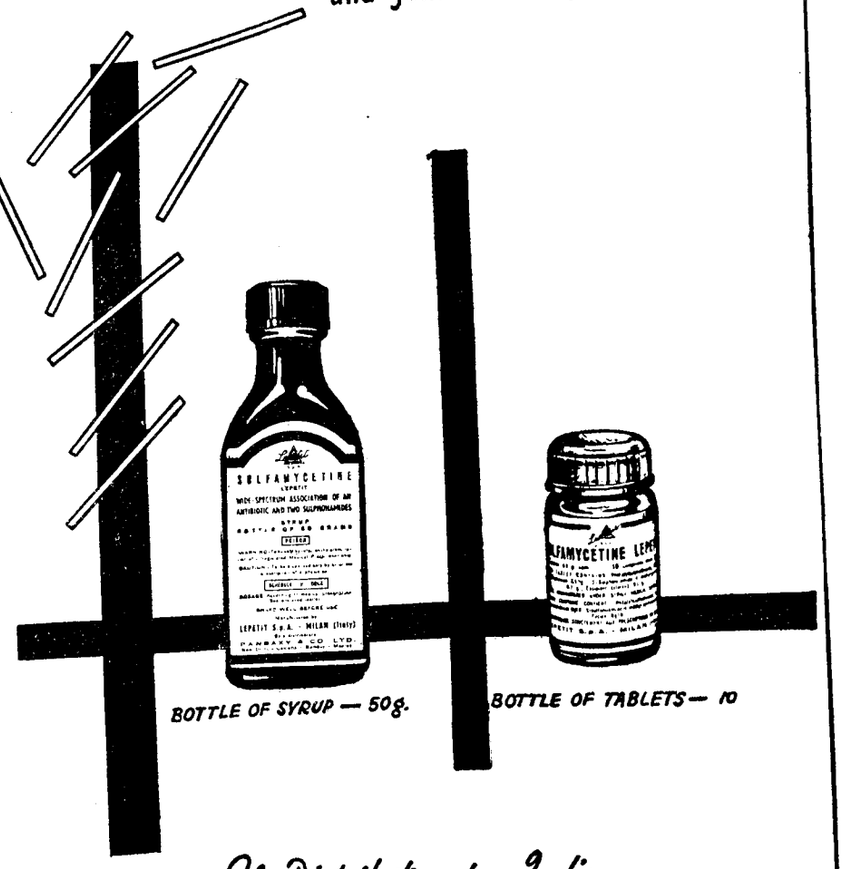
MG2-6 A

Agents for the whole of Indian Union :
PARRY & CO. LTD., P. B. No. 12, MADRAS-1

sulfamycetine

Lepetit

in infections of the gastro-intestinal and genito-urinary tracts.



BOTTLE OF SYRUP — 50g. BOTTLE OF TABLETS — 10

Sole Distributors for India

RANBAXY & CO., LTD.

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NEW DELHI

BRANCHES

BOMBAY CALCUTTA DELHI KANPUR MADRAS

PRC 54

PRINCE DLH

FOR ALL DISEASES RESULTANT OF HYPOVITAMINOSIS

MUL-MIN

A multi-vitamin Tonic Syrup containing all the important factors of the Vitamin B Complex along with the Hæmatinic principles Folic Acid & Vitamin B_{12}, together with Vitamins A & D and the Lipotropic factors Choline and Methionine.

Each fl. oz. contains :

COMPOSITION :

Vitamin B_1	... 10 mg.	Choline Chloride	... 100 mg.
Vitamin B_2	... 5 mg.	Biotin	... 100 mcg.
Vitamin B_6	... 2 mg.	Inositol	... 50 mg.
Vitamin B_{12}	... 10 mcg.	P.A.B.	... 50 mg.
Folic Acid	... 1·5 mg.	Vitamin A	... 5000 I.U.
Nicotinic Acid Amide	... 150 mg.	Vitamin D	... 1000 I.U.
Calcium Pantothenate	... 20 mg.	Traces of Copper, Cobalt and manganese	
Methionine	... 100 mg.		

ASSOCIATED DRUG CO. LTD.
YERCAUD, : : (S. INDIA)

VITA-FOLIC

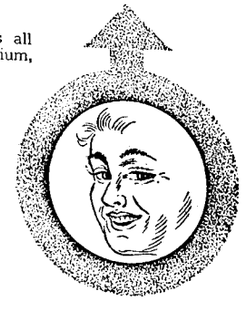
VITAMIN TONIC WITH FOLIC ACID

BUILDS CELL NUTRITION & IMPROVES METABOLISM

Vita-Folic, a highly nutritive tonic supplies all essential vitamins in high dosage and calcium, iron and phosphorous fortified with copper, manganese and arsenic. Inclusion of folic acid as a cellular maturation substance helps treat megaloblastic anaemias. Vita-folic enhances processes of food utilization and corrects malnutrition.

Indications: Infections of respiratory tract, lungs and bronchii, Phthisis, in pregnancy and malnutrition, in Beri-beri, Pellagra, Polyneuritis, Gastro-intestinal disturbances, secondary anaemias, general convalescence, etc.

Available in Bottles of 4 fluid ounces and 16 fluid ounces and bottles of 25 tablets and 100 tablets.



WORLI CHEMICAL WORKS LTD. WORLI RD, BOMBAY 18

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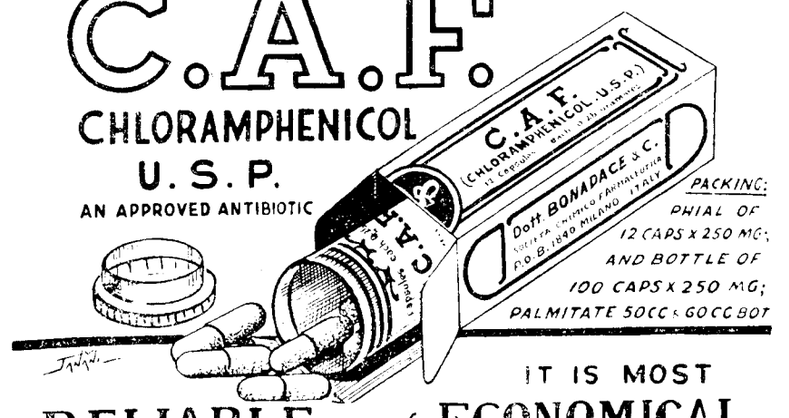
C.A.F.

CHLORAMPHENICOL U.S.P.

AN APPROVED ANTIBIOTIC



PACKING:
PHIAL OF 12 CAPS x 250 MG;
AND BOTTLE OF 100 CAPS x 250 MG;
PALMITATE 50CC & 60CC BOT

IT IS MOST

RELIABLE and ECONOMICAL

IN THE TREATMENT OF VARIOUS BACTERIAL INFECTIONS.

LITERATURE ON REQUISITION

MILLS ANARCHAND SOBACHAND, POST BOX NO. 518, MADRAS : 3.

STOCKISTS : 1. M/s. NATH & CO., Princess St., Bombay-2
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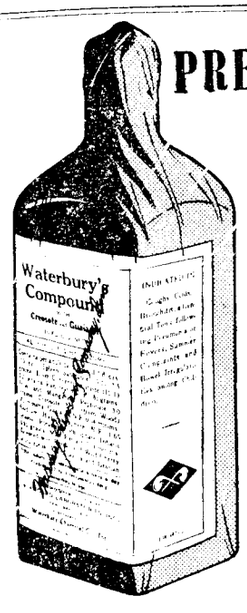
3. M/s. PREMIER MEDICAL SUPPLIES & STORES, 44/45, Ezra St., Calcutta-1



PREVENTION IS BETTER THAN CURE

PROPHYLAXIS. When disregard of warning signals such as fatigue, loss of appetite and general debility, invites respiratory infections, then Waterbury's Compound will indeed prove timely.

GENERAL THERAPY. Waterbury's Compound will stimulate appetite, help to improve the blood picture and heighten that rather indefinable state known as a sense of well-being.

THE INTRACTABLE COUGH. The creosote and guaiacol in Waterbury's Compound will prove a therapeutic boon. The cough soon loosens and gradually diminishes in frequency.

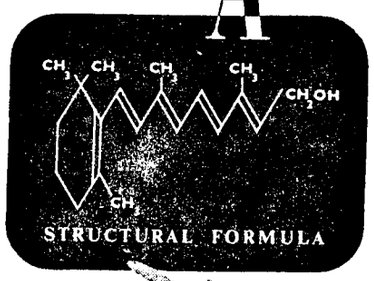
CONVALESCENCE. Convalescence is still a few stages removed from complete recovery. It is best to continue prescription of Waterbury's Compound until danger of relapse is past.

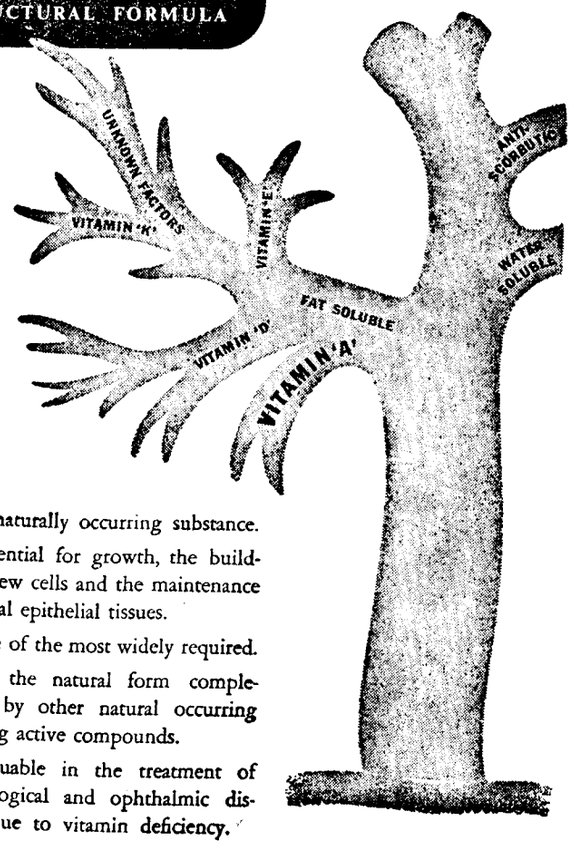
WATERBURY'S COMPOUND

MARTIN & HARRIS LTD.
Mercantile Buildings, Lall Bazar, Calcutta. *Also at* Bombay, Madras and Delhi
Made in England by VINCE LABORATORIES Ltd., London, W. 4

WR-1

CROOKES VITAMIN A





VITAMIN 'A'

is a naturally occurring substance.

is essential for growth, the building of new cells and the maintenance of normal epithelial tissues.

is one of the most widely required.

is in the natural form complemented by other natural occurring stabilising active compounds.

is valuable in the treatment of dermatological and ophthalmic disorders, due to vitamin deficiency.

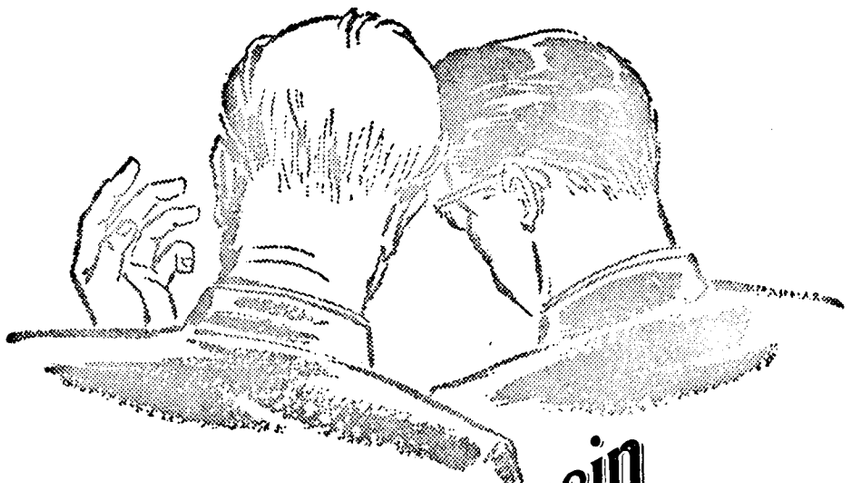
PACKINGS: 3 minim capsules (each containing 33,000 I.U.) in bottles of 25, 100
1 ml. ampoules (each containing 100,000 I.U.) in boxes of 6

THE CROOKES LABORATORIES LIMITED *(Incorporated in England)*
COURT HOUSE - CARNAC ROAD - BOMBAY-2

CB-4

"You know... I've always found PERTUSSIN very effective in treating coughs"

For over 60 years, PERTUSSIN has been prescribed with success for coughs of all kinds. It contains only therapeutically active constituents, and is completely free from narcotics, chloroform and creosote. The action of PERTUSSIN brings these affections under control by soothing the irritation in the respiratory passages and promoting expectoration —it relieves, it does not suppress. You can prescribe PERTUSSIN for the very old and the very young. They will find it pleasantly palatable and easy to assimilate.



For rapid results in the treatment of
Whooping and other Coughs
Bronchial Catarrh
Bronchial Asthma

Pertussin
"TAESCHNER"

Manufactured in India by **infa LTD.** (infa) P.O. Box 1041, BOMBAY-1

Under arrangement with **ETEPHA LTD.**, Schaan, Liechtenstein
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ILY-5

'BIOLISPAN' THERAPY
FOR THE
CONQUEST OF OLD AGE

'Biolispan' has established its reputation as the great landmark in therapeutics. It obtains conditions of complete rejuvenation, longevity and normal living. It is based on principles enunciated at the Congress of International Association of Gerontology held in London in July 1954, which was attended by scientists of fifty nations. It helps to solve a variety of problems confronting the physician.

'Biolispan' is a standardised hormone product, fortified by essential vitamins, Yohimbin, Lecithin, Calcium Magnesium salts of hexaphosphoric acid, gold, silver and Iron. It is indicated in PATHOLOGICAL DISTURBANCES OF SEX AND OTHER GLANDS, IMPOTENCY—PHYSICAL AND SEXUAL, NERVOUS PROSTRATION, HYPERTROPHY OF PROSTATE GLAND, INFANTILISM, ATROPHY OF URINO GENITAL ORGANS, FRIGIDITY AND STERILITY IN WOMEN, MENOPAUSAL DISORDERS, INDIGESTION, SPINAL WEAKNESS ETC., ETC.

The complete course covers 18 weeks. For the convenience of patients and the medical profession, the Institute has introduced a small packing of 135 doses to meet a treatment of six weeks. The full course can be had for continuous treatment or for three periods of six weeks each.

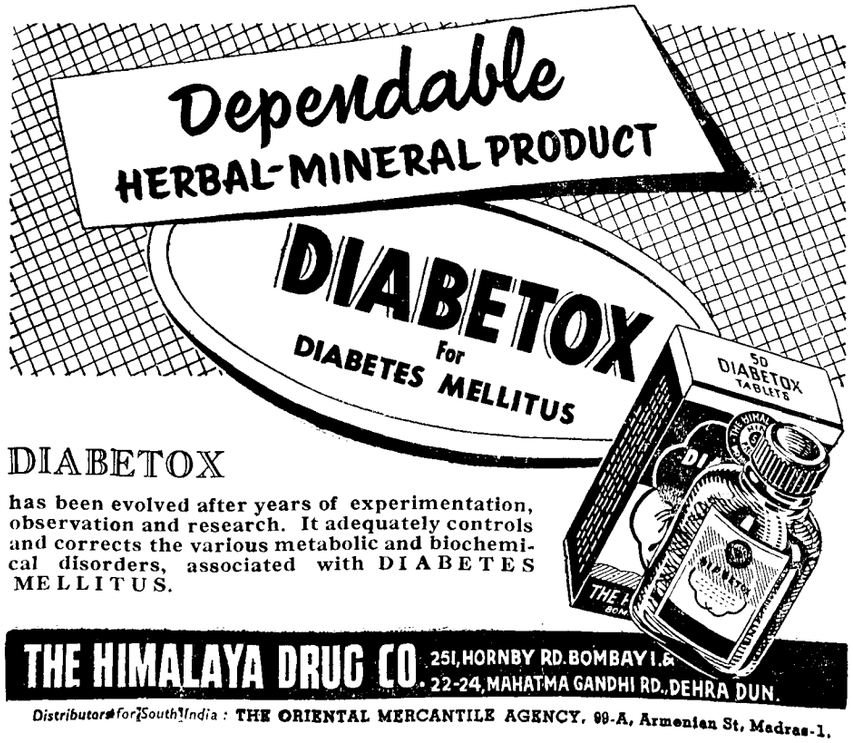
Price complete course (18 weeks) Rs. 350/-

Small packing (6 weeks) ... Rs. 130/-

'Biolispan' comes in two forms:
BIOLISPAN 'M' for men and
BIOLISPAN 'F' for women.

Literature and clinical data available from the Institute.

HYGIENIC RESEARCH INSTITUTE,
P.O. Box 1192. BOMBAY-1



DIABETOX

has been evolved after years of experimentation, observation and research. It adequately controls and corrects the various metabolic and biochemical disorders, associated with DIABETES MELLITUS.

THE HIMALAYA DRUG CO. 251, HORNBY RD. BOMBAY 1. & 22-24, MAHATMA GANDHI RD., DEHRA DUN.

Distributors for South India : **THE ORIENTAL MERCANTILE AGENCY, 99-A, Armenian St, Madras-1.**

A PRODUCT OF ADCCO LTD., CALCUTTA-27

COMPOSITION:

PER FLUID OUNCE for ADCCO'S Compound with Vitamins contain:

Vitamin A	10,000 I.U.
Vitamin D	2,000 ,,
Vitamin B	1,332 ,,
Vitamin C	1,000 ,,
Folic Acid	2 mg.

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

OFF SCHEDULE...

Working at an accelerated pace, with their daily routine disrupted, more people than ever ignore the urge to evacuate, thereby increasing the incidence of constipation. Agarol Emulsion provides deft and almost effortless supplementation to the finely balanced mechanism of normal evacuation. This smooth, palatable, free-flowing emulsion is geared to co-operate with natural physiological processes and to help to re-establish a regular schedule of bowel movements...by retaining moisture in the stool, by supplying lubrication, and by mild stimulation of peristalsis.

AGAROL

Distributors:
MARTIN & HARRIS LTD.,
Mercantile Bldgs., Lall Bazar, Calcutta
Also at Bombay, Madras and Delhi.

Prepared by
WILLIAM R. WARNER & CO. LTD.,
LONDON (ENGLAND).

WR-3

Standardised..

Reliable

The average Indian diet is poor in B vitamins. As a result, deficiency of more than one factor is common. Such mixed deficiencies are potentially serious and if not corrected may lead to conditions as diverse as macrocytic anaemia, neurological complications, cardiovascular disturbances, gastro-intestinal disorders, cheilosis, glossitis, etc. Symptoms such as anorexia, lassitude, insomnia, and depressive states are often due to B complex deficiency.

Complex B 'Glaxo' provides in standardised combination therapeutic amounts of six major components of B complex including vitamin B_{12}, the anti-anaemic factor. Complex B 'Glaxo' can be safely relied upon for a swift and satisfactory response in vitamin B deficiency syndrome.

Complex B GLAXO

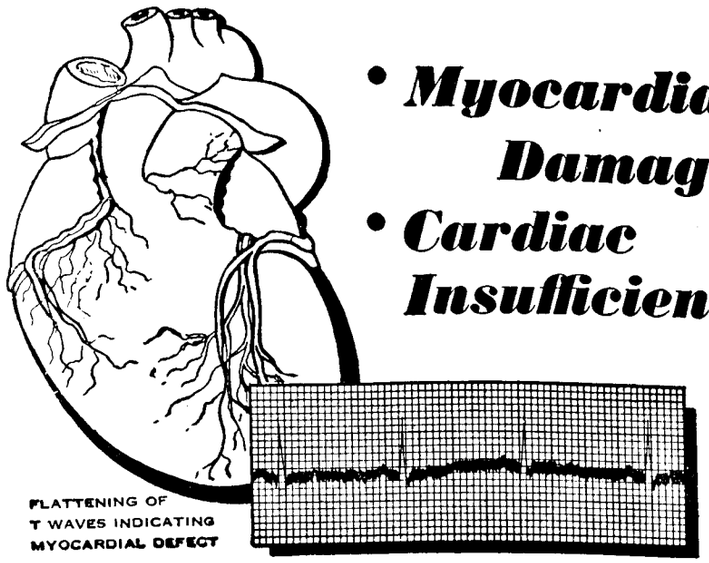
VITAMIN B_{12}/B COMPLEX INJECTION

Each cc. contains:

Vitamin B_{12} (Crystalline)	10 micrograms	Nicotinamide	50 mg.
Vitamin B_1	10 mg.	Pyridoxine hydroch.	3 mg.
Calcium pantothenate	5 mg.	Riboflavine	1 mg.

In 10 cc. rubber-capped phials

GLAXO LABORATORIES (INDIA) LTD. BOMBAY · CALCUTTA · MADRAS



• ***Myocardial Damage***

• ***Cardiac Insufficiency.***

HERZOLAN CIPLA

EXTRACTUM CORDIS TOTALIS

ORAL

"Cardiovascular diseases are caused primarily by the degeneration of heart muscle. If we replace the used up and missing active chemical constituents contained in the heart muscle responsible for normal myocardial activity, the onset of organic heart diseases could be prevented and a number of lives thus saved".

HERZOLAN is a concentrated heart muscle extract containing all the important chemicals and the essential enzyme Cytochrome C present in the heart muscle. HERZOLAN is a natural food and nourishment for the degenerating heart muscle which quickly responds to this nourishment and regains normal activity. (Ref: Abstract of World Medicine, Sept. 1950, No. 1047; Science 104.)

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BOTTLE OF 6 OZ.

Cipla

B O M B A Y - 8.

"HERZOLAN"
Exhaustive Literature sent on request

Cipla Sales Depot 1/186, Mount Road Madras

choice parenteral multivitamin

for the surgical patient

PANCEBRIN

(Multiple Vitamins, Injectable, Lilly)

ready to use for intramuscular injection; may also be added to dextrose or saline intravenous infusions

FORMULA

EACH 2 CC. CONTAIN:	
Thiamin Chloride	10 mg.
Riboflavin	2 mg.
Pyridoxine Hydrochloride	3 mg.
Pantothenic Acid (as Sodium Pantothenate)	3 mg.
Nicotinamide	20 mg.
Ascorbic Acid	60 mg.
Alphatocopherol	2 mg.
Vitamin A Synthetic	10,000 units
Vitamin D Synthetic	1,000 units

IN 2-CC. AND 10-CC. AMPOULES

DOSE

2 cc. daily, continued as long as needed.

ELI LILLY AND COMPANY OF INDIA, INC.
(Incorporated in the U.S.A., the liability of the members being limited)
P. O. Box 1971, Bombay-1

We have the pleasure to announce, for the first time in the field of contraceptives

THE PREPARATION OF

OVATRIM

(For Oral use)

An ideal contraceptive
for family planning

OVATRIM

is the active principle of
Pisum Sativum Linn
prepared Synthetically in our Laboratories

1. S. N. Sanyal, *Cal. Med. Jour.*, 47, 313, 1950
2. S. N. Sanyal, *Cal. Med. Jour.*, 49, 354, 1952

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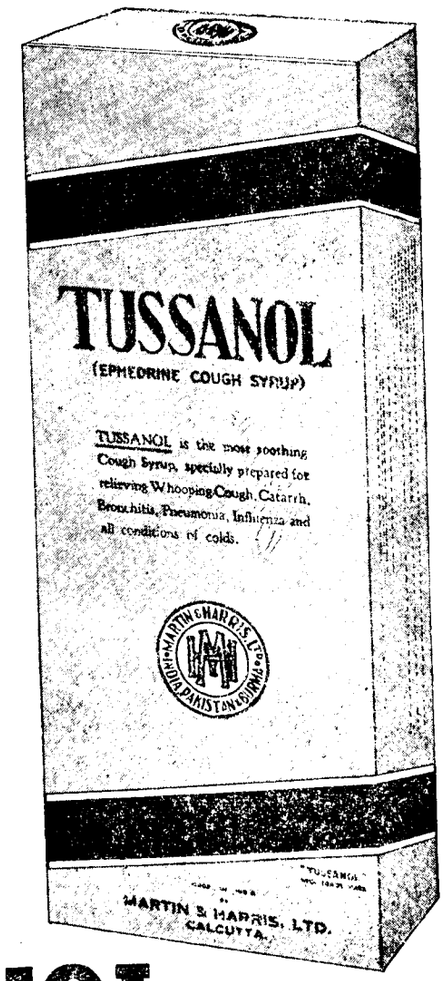

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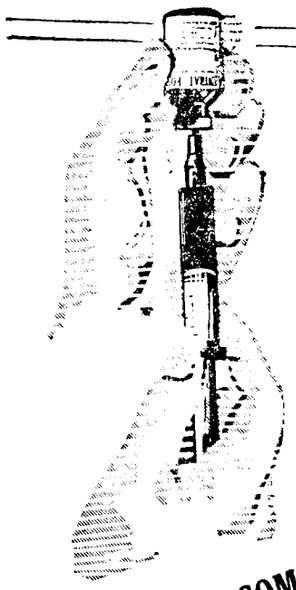

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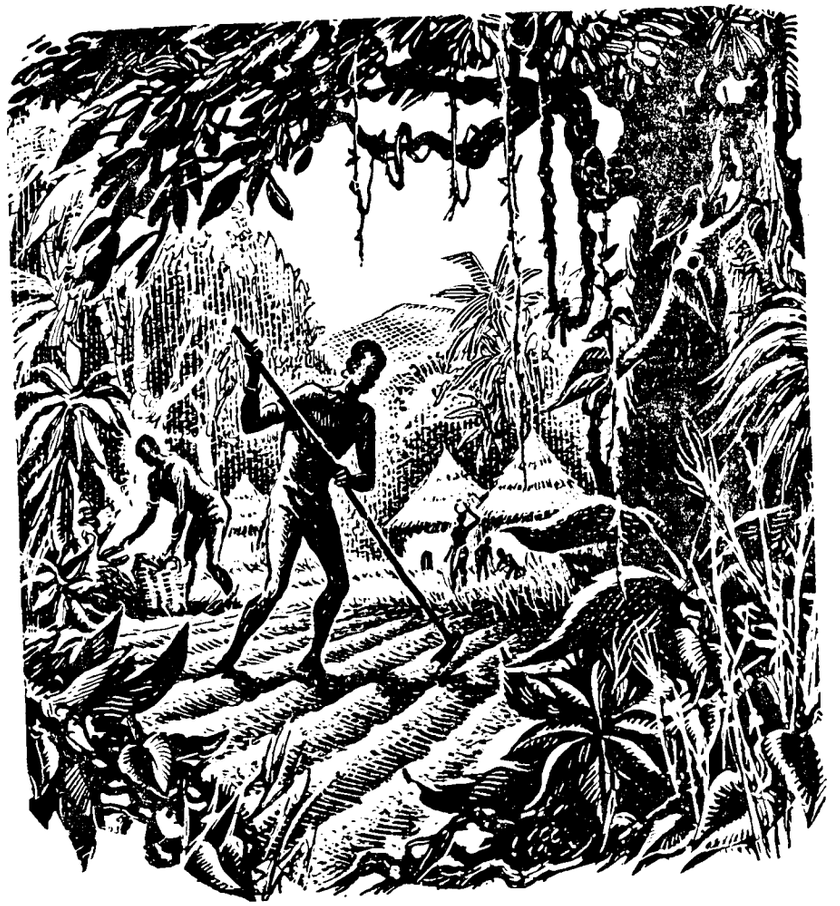

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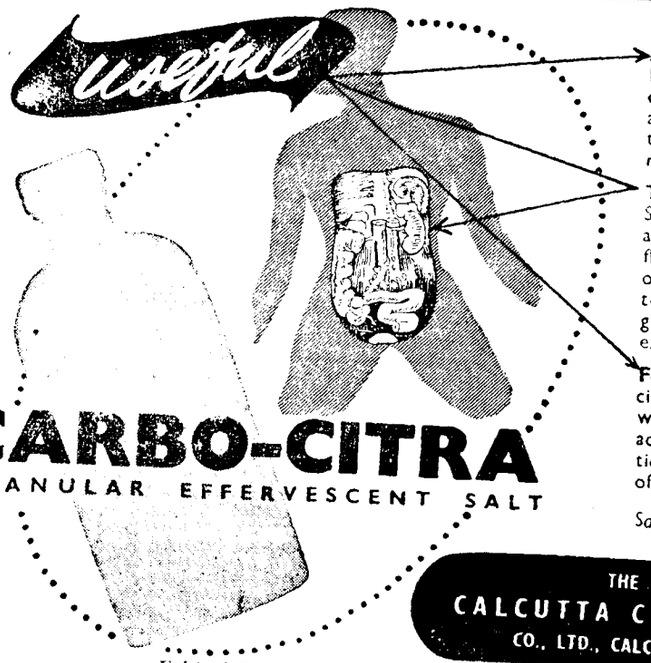

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Original Articles

PSORIASIS*

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Aetiology.–Psoriasis is a common condition characterised by the presence of clean red dry scaly patches of characteristic appearance with extremely intricate foundations and superstructures, occurring on various parts of the body for varying periods and then disappearing without leaving any trace or scar behind. This disease has existed for centuries and is thus an ancient one. Psoriasis has been mentioned as "Psora or Scabies with pruritus" by Willis. Turner was the first to write on dermatology giving a description of the anatomy of the skin. The nomenclature given by William to different skin conditions may be considered the basis on which modern dermatology rests.

The disease bas been variously attributed to parasitic agencies, toxins of bacterial and metabolic orgin, and to neuropathic causes. Psoriasis often runs in families. An atavistic tendency to reversion to the fish type of scales has also been suggested by some. It is considered by some to be a hereditary form of syphilis. Glycosuria and blood sugar have been noted in groups of cases under investigation. A very proper suggestion is that, psoriasis may be a dry form of seborrhœa. From the incidence of cases, and patterns of their manifestation, this is a very acceptable theory.

A parasitic theory has been mentioned, citing the Koebner's phenomenon *viz.*, the tendency in a psoriatic, to get patches of psoriasis at the sites of injury (Bizzozero). I have seen cases with this tendency and psoriatic patches forming over sites of injury.

*Specially contributed to the ANTISEPTIC.

A neuropathic influence acting on the vasomotor system has been suggested by some. Psoriasis is closely allied to rheumatoid arthritis. There are quite a handful of cases with the small joints affected and ending in contracture. The classical picture of psoriasis with very generalised erythematous patches accompained by temperature, small-joint pains and recent contracture, is found more often in books than in actual practice. I however, had a case some months ago of this classical pattern. It is for this pattern that ACTH is recommended ; but I could not use ACTH and the patient settled down extremely satisfactorily with heavy doses of Penicillin, Vitamin B complex, riboflavin, and a few exposures of Ultra-violet light.

A few claim to have seen monilial growth in scrapings from the psoriatic patches. Tubercle is blamed by some but without sufficient basis.

Schamberg and his co-workers concluded that in psoriasis, there was "a positive nitrogen metabolism," retention of nitrogen. He claims great success from a low protein diet. For hard manual workers he adds cream and butter. According to the latest views, lipoid metabolism is believed to be at fault.

Grentz and Buerger found in psoriatics, diabetics and in Xanthamatosis that the widened papillae of the cutis were packed with fine lipoid granules; these were found collected also along the capillaries and finally at the inter-cellular spaces and in the superficial scales. These accumulations of fat are detectable by the Burger's test. Grentz cured psoriasis using only a diet poor in fat. Taking Schamberg's and Grentz's views together, there must be a reduction in the total calories-intake.

It has been ascertained that the chloride content of the sweat in psoriatics, is increased and that the actual psoriatic patches do not sweat. This led to the recommendation by some of sweat baths, as a method of effecting a cure.

Bulkley and Brocq confirmed during the first World War that psoriasis disappeared when sufferers were given a poor diet. Overfeeding brought on more patches. The effect of various methods of dieting was investigated, and given the name of 'Unstimug diet,' which consisted in starting the patient on a particular diet and keeping him on it for one week and then changing it over completely to another type in the next week ; this reshuffling necessitated an adaptation by the system to the complete change in the diet which helped, to bring down psoriasis.

Nathan and Stern believe that fasting and weight-reducing diets would be helpful. Brocq advocates a vegetarian diet which has found general support.

A number of experiments were made to prove that psoriasis was the expression of a disturbance in the lipid metabolism ; the administration of lipotropic and lipocaic substances was tried.

In view of a possible inadequacy of the adrenal cortex in psoriasis (Greenberg) and the consequent necessity of Vitamin C the treatment consisted of low potassium, high Vitamin C and adrenal cortical extract.

The sulphur content of the psoriatic scale is high and some suggest that it must be high even in the psoriatic skin as well. Some noted a decreased urinary excretion of sulphur and of ascorbic acid. As the cellular metabolism in the epidermis of psoriasis would require extra Vitamin C, Goldfart stressed the need for Vitamin C as a remedy for the para-keratosis in psoriasis ; he also claimed cures in psoriasis by the administration of massive doses of Vitamin P (Eriodictin) daily.

In my experience, the condition always improved. There have been cases where the condition was completely cured and there was no recurrence for a very long time.

I have found many of the seborrhœic erythrodermias, some of the old lichenified patches, which had been treated as doubtful fungus infections, and some of the general exfoliative types of dermatitis turn out to be really cases of psoriasis. A general dermatitis when seen in its extensive stage, is puzzling. The history is sometimes helpful, sometimes not. In these cases I have found, that when the patient gets better, and then there is a recurrence of the trouble, showing in a few new patches, it is possible to diagnose the whole reaction as just an exacerbation of a basic psoriasis.

I have lately had cases of psoriasis of the scrotum, the groins and the pubis more often, which is rather unusual. Psoriasis inside the ear around the meatal margin is often mistaken for a fungus infection. Psoriasis causes a characteristic pitting of the nails. (*Fig. 1*). Psoriasis of the prepucial margin is a condition which may be mistaken for a fungus or due to avitaminosis.

A scrotal condition, affecting the scrotum alone is usually due to fungus. It is an allergic dermatitis, avitaminosis, seborrhœa, psoriasis or a lymphoria. The dry patches over the palms and soles, and over the finger tips, just below the nail, without any actual irritation or inflammation in the nail margin, is more often psoriasis.

Histopathology.—(*Figs. Nos. 2 and 3*).—The capillaries in the dermis are dilated, and the corium is slightly œdematous. The changes in the epidermis are :—the prickle cell layer is hypertrophic (Acanthosis). The granular layer is absent and the horny layer is replaced by soft and plastic parakeratosis cells, which adhere together to form squamæ, silvery in colour, as the cells have become dried and shrunk allowing air spaces to form. There is much cholesterol in the scales of psoriasis.

Signs, symptoms and course.—Psoriasis is essentially an adult disease, but is not infrequently seen in persons of all ages. The youngest that was affected was 8 months old. Psoriasis is

a typical papular manifestation, and essentially dry. Cases which were eczematised or impetiginised have also been noted. The papules vary in size, sometimes big enough to cover the whole of the back or a portion of it.

The patches are sometimes covered with characteristic scales, when there can be no mistaking them. Some patches are devoid of scales, with the smooth, fresh red surfaces exposed. The psoriatic scales are flaky, easily removed (*Fig. 4*) centripetally arranged and silvery white in colour. When the scales are removed, a smooth shiny red area is left with red spots which look like punctiform hæmorrhages, but are only the loops of capillaries. Psoriasis does not usually itch, and does not affect general health. Recurrence is the rule. The severity, and the intervals at which this happens, vary. The favourite sites (*Fig. 5*) are the scalp, small of the back, and extensor aspects of the elbow and knee. Other places where it occurs, sometimes making the diagnosis difficult, are the scrotum, groin, and pubic regions. It may affect the nail, manifesting itself from a slight pitting to a complete involvement of the nail matrix causing discoloration and fragmentation. It sometimes occurs as dry isolated patches over the palms or soles, (*Fig. 6 and 7*) and more rarely between the toes, without its characteristic clothing, or its characteristic red Bulkley's membrane. When it occurs over the scalp, as it often does, the patches are dry and restricted and the corona psoriatica is very well marked out.

The papules very often dry, in an adult with his scalp affected, with the characteristic scales in tact in some, and the fresh red surface—Bulkley's membrane without the scales exposed in others, constitute a pattern that is not missed. I attach more importance to the nature of the lesion, rather than to the sites of election.

The undisturbed patch with its full-fledged scales in tact, and with its characteristic silvery sheen cannot be missed. Unfortunately we do not have a chance to see a fresh recent lesion. Very few have come to me, saying that he or she got the skin trouble only on the previous day. A dry restricted patch, with a dry layer covering the surface, is what one generally sees. If the surface is disturbed with a blunt needle, the scales bristle up and if not too dry and keratinised, they come out easily and the disturbed surface appears to have a silvery sheen. Old patches where the scales have been removed show a certain evenness and smoothness of surface, characteristic of the lesion. The biopsy and the appearance of the scales under the microscope are characteristic.

A dermatological diagnosis is not based just on an expert examination of symptoms and a logical evalution of them. The keen eye, the instinct and intuition of the trained dermatologist also enter into the proper assay and appreciation of dermatological conditions. The newer laboratory and scientific aids to diagnosis are only valuable adjuncts in the field of dermatology.

Fig. 1

Fig. 2

S. R., 50 years, Hindu, male. Biopsy—from a psoriatic patch *(Before treatment)*.

Report.—Shows marked proliferation of prickle cell layer which is seen several layers thick. Stratum granulosum and Stratum Lucidum cannot be made out. Stratum corneum is replaced by well marked parakeratosis which is seen to be peeling off very easily. Blood vessels of the sub papillary region dilated and are seen to be surrounded by cuffs of lymphocytes. Histological appearance is that of psoriasis.

Fig. 3

10-10-1947.—The same case *(After treatment)*.

Report.—The horny layer shows no parakeratosis and no tendency to peel off. This is in marked contrast to the earlier specimen which shows both these conditions to a well marked degree. The proliferation of the prickle-cell layer shows diminution, though it has not yet come to normal condition. The dilatation of the blood vessels of the corneum and the perivascular cupping of small round cells are much less marked. The skin condition shows a marked improvement but is not yet completely normal.

[*Vide Page 169*

Fig. 4

Fig. 5

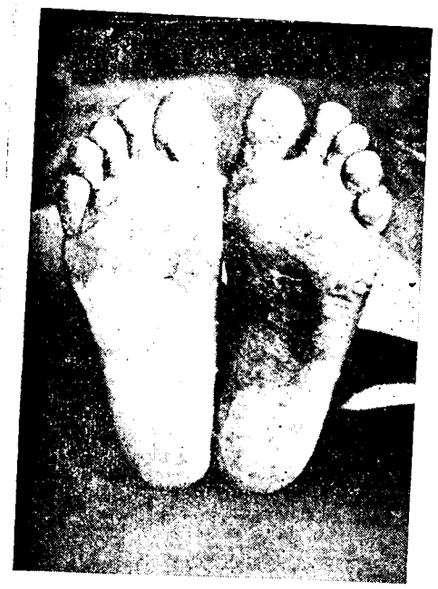

Fig. 7

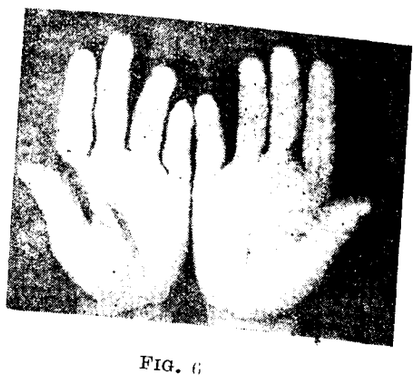

Fig. 6

[Vide Page 170

Differential Diagnosis.—The scalp being a favourite site psoriasis should be differentiated from other common scalp affections some of which are listed below on a rough basis along with the respective age periods.

One month to 6 months–Scabies, impetigo, seborrhœa ; 6 months to 1 year—Impetigo, seborrhœa ; 1 year to 2 years—Seborrhœa, fungus, furuncle ; 2 years to 5 years—Seborrhœa, fungus, furuncle ; 5 years to 14 years—Seborrhœa, fungus, pediculi ; 14 years to 18 years—Seborrhœa invariably, pediculi and 18 years and upwards—Seborrhœa, psoriasis.

(1) Attention is invited to the absence of fungus of the scalp, above the age of 14. The one constant factor throughout, is seborrhœa. Since psoriasis is usually an adult manifestation, almost of the scalp, the only other common condition to differentiate it from, is seborrhœa. From the description of psoriasis already given, a restricted, dry patch, over an adult scalp—is usually (very probably) psoriasis ; restriction and dryness, distinguish it from the typically greasy and never restricted seborrhœic patches.

(2) Psoriasis has no special destructive effect on the hair. I have known patients who have had psoriasis of the scalp for years without any harm done to their hair.

(3) *Fungus of the scalp* affects the hair in particular and in a fungus-infested scalp we see the hair in various stages and degrees of destruction. The diagnosis can be clinched by examining the hair roots under a microscope.

The patches on the scalp often help us to diagnose the body patches and *vice versa*.

Differential Diagnosis of the body patches.–The restricted dry papules covered with the characteristic flaky, easily-removed scales centripetally arranged and silvery white in colour are distinctive of the pattern. The fresh red colour of the papules without the scales, with its smooth appearance and dry shine showing the Bulkley's membrane, is another distinctive feature. Where the fresh redness is not there, the evenness and smoothness of the surface is characteristic. The papules of psoriasis are very well demarcated but has no border. The border is not a separate entity. It is only rarely, that an impetiginised or eczematised patch of psoriasis is seen.

(1) Tinea marginatum is a scaly patch, scratchy, with a vesicular border, usually of short duration. I usually refer to this as a "wet border." We do not often see the patches for we don't see an early undisturbed "lesion." We make it out as "wet" by the presence of raw areas, crusts or healed raw areas ; a scraping from the tinea border reveals the fungus.

(2) *Tinea versicolor* has what may be called a "Pencil line" border, with minute angulations which are characteristic. The scales

are superficial, small, thin, entirely different from the psoriatic scales. Scraping of the surface of the patch of Tinea versicolor reveals the microsporon furfur.

(3) *Pityriasis rosea* has an erythematous border, with thin scales arranged in a "collerette" pattern, which are very different from psoriasis scales; and the characteristic, smooth raised surface of the psoriasis papules, is entirely absent.

(4) There are two dry papular manifestations in dermatology:—(*a*) *Psoriasis* and (*b*) *Lichen*. There is no mistaking their identities. The shade of the lichen papule is distinct from that of psoriasis. There are hardly any visible scales over the lichen papules. Lichen more often affects the mucous membranes.

(5) *Dermal Leishmaniasis*.—The pattern—the characteristic mottling, the definite history of having had the fever, and sometimes a positive sternal puncture decide the diagnosis. The Leishman macules have a typical shade and distribution, which is pathognomonic. The Leishman shade is somewhere between a Hansen shade and a Tinea versicolor shade. The lichen and psoriasis without scales have the distinctive slate and bright red colours respectively.

(6) Four conditions in dermatology affect the nail: Fungus, psoriasis, specific and deficiency conditions. Other conditions, which are not disease entities and so are of no significance are:—(*a*) Leukonychia—white spots in the nails of varying sizes which were formerly believed to be due to inclusion of air in the nail matrix, but later found to be due to keratohyaline cells; (*b*) Koilonychia—Spoon shaped nail; (*c*) Onychogryphosis—a rugged nail with no infection and (*d*) Anonychia—absence of nail. In the above four conditions there are always other patches over the body or scalp to help us in the diagnosis. The history and other co existing conditions, also sometimes help to arrive at a diagnosis. With just the nails affected it is difficult to diagnose. A scraping would reveal fungus, but usually the nail matrix is too hard to allow the recognition in it of the fungus filaments. Perionychia (peripheral irritation and inflammation) is usually associated with fungus nails.

The psoriatic nail does not affect the skin margin around the nail and is usually dry. In psoriasis there is a characteristic 'pitting' which however, is not a fixed entity in every case to rely on for diagnosis. But when it does occur, it is certainly diagnostic.

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PATHOGENESIS OF ACUTE PULMONARY OEDEMA*

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Whereas exertional dyspnœa is usually regarded as a manifestation of heart disease, a more spectacular and rather dramatic type of dyspnœa frequently met with in certain groups of heart disease (arterial hypertension, coronary disease, aortic valve disease) is paroxysmal dyspnœa. The attacks are often nocturnal, and vary considerably in severity—the most severe form is the acute pulmonary œdema, in which the condition of the patient is very alarming and may lead to circulatory insufficiency and death. However, cardiac asthma may develop into acute pulmonary œdema and the distinction between the two conditions is not clear cut. Except in the most severe forms of acute pulmonary œdema, where circulatory insufficiency sets in, the B.P. is very often higher than the patient's usual B.P., and the pulse is hard and frequent.

Though researches into the pathogenesis of acute pulmonary œdema date far back, a clear comprehension of the subject has not been arrived at, due perhaps to the unexpected and nocturnal appearance of these attacks, the relatively short duration for which they last and the capriciousness that characterises them.

The phrase "cardiac asthma" was first used by James Hope (1833). Stokes (1854) considered the condition as an entity, and Mackenzie (1933) emphasised its significance.

Though it is often stated that acute pulmonary œdema is due to the failure of the left ventricle, this is perhaps an over-simplification, for various complex factors operate in a sort of vicious circle. For the purpose of classification and clarification, these factors may be divided into:—(*i*) hæmodynamic and (*ii*) neurogenic.

Haemodynamic.—The presence of high B.P. and hard pulse militate against the primary failure of the left ventricle as the sole or the only cause. Besides, some authors have found increased cardiac output during the attack of cardiac asthma[3]. However, it must be conceded that it is specially in cases of weakness of the left ventricle that these paroxysms are found.

That these patients have a more or less pronounced pulmonary congestion has recently been proved by direct measurement of the quantity of blood in the lungs. Ebert[2] showed that in patients with mitral stenosis and exertional dyspnœa of long standing, but without hepatomegaly or peripheral œdema, the pulmonary arterial pressure is markedly increased, but the pulmonary blood volume is normal. In left ventricular failure due to hypertension

* Specially contributed to the ANTISEPTIC.

or aortic valve lesions, the pulmonary blood volume is considerably increased, but the pulmonary arterial pressure is less strikingly elevated than in mitral stenosis.

Posture:—On account of the nocturnal appearance of the attack, recumbent posture has often been incriminated. Undoubtedly the cardiac output is about 33% greater in the recumbent than in the erect posture. But it is difficult to understand why the heart is unable to cope with this relatively small increase in load, when the same individual during the day is able to do an amount of work which must be supposed to lead to a considerably greater increase of the cardiac output. It has been observed that when the patients are in the high "pillowed-up" position, attacks are less apt to occur, and standing regularly gives relief. Weiss[8] states the fact that change from lying on the back to lying on the abdomen with the same angle between the thorax and the body results in cessation of attacks, and increase in the vital capacity; and argues that this indicates that angle, and the position of the thorax, rather than of the entire body have an important bearing on the sequence of events within the thorax leading to attacks.

Water content of the tissues:—The lowering of the peripheral hydrostatic pressure during recumbency facilitates the entrance of fluids from the tissues of the extremities into the blood stream. This hydræmia is demonstrated by a fall in the serum protein concentration[1, 5] and the site of water retention tends to be transferred to the lungs. Weiss and Robb have found that the water content of the arterial blood is somewhat diminished as compared with that of the venous blood, indicating a loss of fluid into the lungs.

Some patients have also noticed that paroxysms often appear after the ingestion of large amounts of fluid or NaCl or after having done heavier work on the previous day. Exercise is known to cause NaCl and water retention. Kattus[4] found that increased renal NaCl retention is a normal response to exercise due to increased tubular reabsorption of filtered electrolytes, not necessarily related to a fall in filtration rate, but possibly elicited more readily and intensely in cardiac failure. This was worked out by simultaneous determination of clearances of Inulin, Para-amino-acetyl hippuric acid, chloride, sodium, potassium and phosphate.

Sleep:—But why should the attacks be more frequent when the patient is awake, though recumbent? Is it possible that when awake, the patient easily notices the very first symptoms of the attack, and is readily able to stop it by sitting up or getting out of bed? Or has this something to do with the complex neurogenic changes?

Neurogenic factors.—It has been conjectured that the pulmonary congestion as such, and specially the increase of pulmonary

congestion which occurs at night, may start various reflex mechanisms, causing polypnœa, bronchospasm, acceleration of the pulse rate etc. Churchill *et al* recorded the effects of the experimental production of pulmonary congestion and œdema in the lung completely isolated from the general circulation but with an intact nerve supply. The resulting changes are a slowing of the heart-rate, a fall in systemic B.P. with temporary inhibition of respiration, followed by rapid shallow breathing. The pulse rate and B.P. show a rapid and spontaneous return to initial conditions. The respiration shows a partial, but not complete return to the former rate and depth. These results support the hypothesis that the rapid shallow breathing attending congestion and œdema of the lungs is due to the stimulation of nerve endings in the lungs. In cardiac asthma also, the oxygen content of the blood is found to be normal and the CO_2 tension, if anything, decreased during the attacks.

Weiss and Robb[8] state that reflexes probably play a relatively significant role. They showed that the vagus nerve blocked with procaine hydrochloride resulted in an improvement of the dyspnœa, and orthopnœa, elevation of the vital capacity, ipsilateral disappearance of rhonchi and rales, and improvement of the breath sounds. Further, Wassermann states that it is possible to stop attacks of acute pulmonary œdema by carotid sinus pressure. The bronchospastic factor is pronounced both in cardiac and bronchial asthma, and we observe similar beneficial effects of aminophylline on respiration in both the conditions. The beneficial effect of morphine on the various forms of paroxysmal dyspnœa has also been taken as indicating that neurogenic influences are in action.

The patients with marked left ventricular disturbance often develop nocturnal Cheyne-Stokes breathing. The circulatory changes incidental to this type of breathing together with the sudden awakening with excitement in the beginning of hyperpnœa, during which the inspiratory position of the thorax becomes progressively increased, easily lead the already overfilled pulmonary circuit to acute pulmonary congestion. Noise, nightmare, paroxysms of coughing caused by gradual accumulation of mucus in the respiratory passages during sleep, the urinary reflex, and other factors may induce a change from a state of relative depression to sudden hyper-excitability of the vasomotor, cardiac and other centres. Such factors act as triggers in precipitating an acute and temporary imbalance between the functioning of the right and left ventricle, a heightened pulmonary congestion with acute pulmonary vascular hypertension, resulting finally in pulmonary œdema. Thus we have:—pulmonary congestion—increased nocturnally on account of increased venous return in the recumbent posture—hydræmia—reflex action in respiration and circulation—resulting clinically in cardiac asthma or acute pulmonary œdema.

During recent years, Nylin *et al* hold that the heart works with residual blood volume. Warren, Weens and others[7] using slow motion cineradiography on small mongrel dogs for studying cardiac activity, found incomplete emptying of the heart chambers in every instance. The amount of residual blood in the ventricles, as well as in the atria during systole was more than anticipated. Thus increases or decreases in stroke volume may be the result of alterations in the amount of residual blood. So if under any circumstances, an increased output is demanded of the left ventricle, this may occur through (i) an active reflectory stimulation on the power of contraction as such or, (ii) in a passive way, the left ventricle automatically being more completely emptied if the peripheral resistance is diminished as a consequence of decrease of the diastolic B P. We may have either (1) the primary increased emptying of the left ventricle, and or (2) the primary increased filling of the heart from the veins. Although both mechanisms are directed towards the same end, their effect on the pulmonary circulation is different. The emptying mechanism will cause a decrease of pulmonary congestion, while the filling mechanism will cause an increase.

This newer conception may be able to explain the nocturnal paroxysms of dyspnœa. It is surprising why these patients are capable of doing a certain amount of work in the day time, whereas they are subject to attacks of cardiac asthma or even acute pulmonary œdema at night. While working, they use their emptying mechanism, which if anything, decreases pulmonary congestion. Riley *el al*[6] have found a decrease in pulmonary artery pressure during exercise. But when they lie down, the filling mechanism becomes active and the congestion of the lungs is increased. The latter is supposed to give rise to certain reflexes, which cause polypnœa, bronchospasm, increase of the B.P. etc. The cardiac output which is increased during recumbent posture has to be delivered against greater resistance (due to increased B.P.) than normal, which again means that the left ventricle must be filled under a still higher pressure in the veins of the lungs. So the pulmonary congestion is accentuated, the reflexes originating from the lungs grow stronger and the increase of B.P. more pronounced—thus resulting in a still higher degree of congestion and so forth. Undoubtedly a vicious circle is set up during the development of acute pulmonary œdema.

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ESSENTIAL HYPERTENSION*

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Hypertension is a very common medical problem. Its treatment is still a challenge to the medical profession. Its frequency, its prolonged course, its damaging influence upon kidneys and the heart, its crippling counter-effects, and its capacity to cut life short within the twinkle of an eye, are some of the problems which make it a dreaded disease. And this dread remains both for the patient, as well as for the physician. For the patient there is always the dread of paralysis or heart attack. For the physician the dread is due to the fact, that he has little to offer to the patient in the form of a permanent cure, that the complications are far more crippling than the original condition, and that in the end the disease is going to claim the patient, no matter what he does for him. But even in the present unsatisfactory state of our knowledge, there is still some ray of hope. Not all cases of hypertension are persistent, or permanent; and with greater understanding of its mechanism, we have more potent drugs to counteract the elevation of blood-pressure.

Anatomical and physiological considerations.—The cardio-vascular system is a closed unit, consisting of a heart—the pump distributing blood to the remotest parts of the body, and two systems of blood vessels—(*a*) arteries—which are distributive pipe lines. They take blood to the various parts of the body, and (*b*) veins—which are the drains which collect the blood, and take it back to the heart.

For the study of hypertension, we have to centre our attention on the heart and the arterial part of the circulation only. The arteries become smaller and smaller. Large arteries possess normally, a good amount of elastic tissue. The elastic tissue lessens, as the arteries become smaller. And by the time we come to the arterioles, there is practically no elastic tissue at all. Arteriolar walls are muscular only. Thus though both the arteries, and the arterioles are normally elastic, the elasticity of the arterioles depends mainly on the muscle tonus.

As the blood flows through the arteries and arterioles, there is friction between the inner surface of the walls of these blood vessels, and the outer layers of the circulating fluid. The greater the elasticity of the vessel walls, the less is the friction, and *vice versa*. Again the smaller the vascular tube, the greater is the friction. This

* Specially contributed to the ANTISEPTIC

friction is designated as "peripheral resistance." Thus peripheral resistance is infinitely greater in the arterioles than in the larger arteries and increases still further when the blood vessels are constricted. The increase of peripheral resistance is produced by the constriction of the blood vessels and by the increased velocity of blood due to stronger cardiac contractions, as a result of the reduction in the arteriolar diameter.

It is now universally agreed that as far as the elevation of blood pressure in essential hypertension is concerned, the most important single factor is arteriolar contraction. All evidence, experimental and clinical, points to the absence of any appreciable increase in peripheral resistance proximal to the arterioles. The rise in resistance is confined solely to the arteriolar area.

Arterioles being thus important from the standpoint of the anatomy of hypertension, its muscle must contract in response to nerve stimulation. The vaso-constrictive nerves supplying the arteriolar muscle, come from the vaso-motor centre, in the medulla oblongata; the vaso-constrictive nerve fibres pass through synapses in the sympathetic ganglia, to endings in the smooth muscles of the arteriolar wall. The vasomotor centre in turn is controlled by higher centres in the nervous system. Two such centres are known to exist: one in the diencephalon (in the hypothalamic region), and the other in the cerebral cortex (on the undersurface of the frontal lobes).

The vaso-constrictive centre can be stimulated directly by certain toxins, by drugs, by CO_2, or it can be stimulated reflexly through sensory nerves, through the vagus, or through cervical sympathetic trunks. Normally the activity of the vasoconstrictive centre, and its associated nerves is controlled by physical or chemical stimuli arising in the carotid sinus, and aortic nerves which exert a moderating influence, on the vasomotor centre, and help in vasodilatation.

Mechanism of hypertension.—The agencies which produce hypertension can be (*a*) of a temporary nature, producing functional vasoconstriction; hypertension is then a reversible process; or (*b*) of an organic nature, producing structural changes in the blood vessels, especially the arterioles. In this case the hyypertension is permanent. Clinical and experimental data indicate that in the majority of cases of essential hypertension, the arteriolar constriction is of a temporary nature, and is reversible. In the average hypertensive patient, the arterioles are capable of vasodilatation, and there are no irreversible structural changes in the vessels. In the hypertensive patient, as in the normal individual, there does exist some mechanism, by which he can ordinarily maintain his blood-pressure at a normal level. His blood-pressure remains at a higher level because his nerve mechanism works at a higher threshold as compared with the normal individual.

Theories about the causation of essential hypertension.—As stated above, peripheral vascular spasm, due to widespread arteriolar constriction, is the most important single factor in the production of essential hypertension. It now remains to be seen what factors, or agencies produce the vaso-constriction: The agencies can be classified into (1) Nervous; (2) Hormonal; and (3) Renal.

(1) *Nervous factors*:—In some persons the sympathetic nerves are over-sensitive; *i.e.* such persons are sympathetico-tonics in whom any small irritation direct or indirect produces exaggerated sympathetic response. Such patients are irritable and excitable, and easily get upset. They may be aggressive and quarrelsome. Hypertensive attacks in such persons are associated with emotional upsets. In short, their hypertension depends on their response to emotional rather than to physical stimuli. The hypertensive patient reacts to emotional and physical stimuli by a circulatory response, so that he gets an elevation of blood-pressure and renal vasoconstriction. This physiological change is reflected in his irritative nature, and aggressive behaviour. In such a sympathetico-tonic personality, the development of essential hypertension depends upon the frequency and intensity with which the reaction is evoked by life situations in which the individual finds himself. By such repeated reactions, his sympathetic nerves become so sensitive, that any minor stress brings about renal vasoconstriction, and a rise in his blood-pressure.

(2) *Hormonal factor*:—Certain endocrine glands exert an influence on blood-pressure. The adrenal cortex secretes mineralo-corticoids in susceptible individuals which induce hypertension that may become permanent if the stress continues. The influence of the pituitary on blood-pressure is assumed to be through the adrenal cortex. The somatotropic hormone of the anterior pituitary sensitizes the peripheral tissues to mineralo-corticoids, by bringing about hyperactivity of the adrenal cortex. Hypertension seen in thyrotoxicosis is secondary to increased cardiac output, and has nothing to do with the peripheral vascular supply. On the whole it must be stated that, in the present state of our knowledge, the role of the endocrines is hypothetical. Endocrine influence occurs in a very small percentage of cases of essential hypertension.

(3) *Renal factors*:—Goldblatt *et al* demonstrated the importance of a renal hormone, in essential hypertension. The tubular cells of the kidney produce an enzyme called *renin*. It is protein in nature, and is specific for each species of animals. Man responds only to human renin. The normal kidney does not produce renin. But if renal vasoconstriction occurs, or if there is fall of blood-pressure, or if the kidney is in anyway pathological, then renin is secreted by the tubular cells of the kidney. It enters the blood stream through the renal vein, and interacts with *Hypertensinogen* (renin activator). Hypertensinogen is an alpha

globulin produced in the liver. Its rate of production is to some extent controlled by the adrenal cortex. Hypertensinogen and renin interact to produce *Hypertensin* which possesses a powerful vasoconstrictive action. The available data favour the view that renin-hypertensin mechanism is an important factor in the pathogenesis of hypertension.

To summarize :—(1) A sensitive sympathetic nervous system is the most important agency ; (2) hormones are responsible for hypertension in a few cases only ; and (3) renal and hepatic factors are important chemical agents in many cases.

Aetiology :—The predisposing factors of essential hypertension are :—(1) *Age* :—It is uncommon before the age of 20 years and the greatest incidence is between the ages of 50 and 60.

(2) *Sex* :—Both sexes are equally affected. Malignant hypertension is commoner in males, than in females (ratio of 4 to 1).

(3) *Social status* :—Hypertension is more common in the upper strata of society, the intellectual type being more frequently affected. It is thus common amongst doctors and lawyers. Mental worries, and the stress of modern civilisation predispose to hypertension.

(4) *Obesity* :—Obesity favours the incidence of hypertension as evidenced by the fact that it is more common in the obese.

Types of essential hypertension.—Essential hypertension is defined as a clinical condition in which there is persistent elevation of blood-pressure and for which there is no known recognisable cause, *e.g.*, renal or arterial. The elevation of blood-pressure is the primary condition.

The two main forms of essential hypertension are :—(1) Benign hypertension which runs a mild course, often asymptomatic and may last for years. There may be a few symptoms or none at all. There is no renal involvement. It is more common in females. (2) Malignant hypertension—runs a severe, rapid course, and usually ends fatally. There is severe renal involvement. It is more common in males.

A few other types of hypertension are :—(3) The paroxysmal type—Attacks of hypertension, associated with symptoms occur from time to time, followed by periods of normality in which the patient has no hypertension and is perfectly normal. (4) Transient hypertension—Sudden emotional upsets and irritations, are followed by subjective symptoms of hypertension, and a rise in blood-pressure. When thesemovements pass off the symptoms disappear, and the blood-pressure returns to normal. (5) Secondary hypertension—here the hypertension in secondary to known endocrine, cardiovascular, cerebral or renal diseases.

Another classification of hypertension is into :—

(1) Primary hypertension which may run a benign, or a malignant course ; and (2) Secondary hypertension—when it is secondary to endocrine, cardiovascular, cerebral or renal diseases.

Pathological changes in hypertension.—The pathological changes in hypertension are dependent upon the involvement of smaller arteries, and arterioles of various organs. Changes occur in the following organs :—

(1) *Arterioles* :—There is hyperplasia of the intima and media of the arterioles. There is also perivascular inflammation, and narrowing of the vascular lumen. These changes are found throughout the body.

(2) *Arteries* :—there is arteriosclerosis of the various arteries throughout the body.

(3) *Retina* :—Vascular changes are seen best in the retina. There is narrowing of the arterioles. Some vessels are in complete spasm and appear as white silvery lines. There is also thickening, and tortuousity of blood vessels. Hæmorrhages may be seen in the optic discs.

(4) *Cerebral organs* :—The vessels show arteriosclerosis. As a result of thickening of cerebral vessels, their lumen may be narrowed. Following upon the vascular spasm, cerebral thrombosis very frequently occurs. In other cases, as a result of sudden increase of pressure in these thickened and inelastic blood vessels, a vessel may give way producing cerebral hæmorrhage. Hypertension is the commonest cause of cerebral hæmorrhage. This usually occurs from the lenticulo-striate artery. But pontine hæmorrhage is quite as common.

(5) *Coronary-arteries* :—There is arterio-sclerosis of the coronary arteries whose lumen is markedly narrowed. Spasm of these blood vessels may occur, producing symptoms of angina pectoris, or coronary insufficiency. If the spasm lasts longer, there may be even coronary thrombosis. Repeated mild attacks of myocardial infarcts may weaken the myocardium so much as to lead to acute myocardial failure.

(6) *Renal changes* :—The renal arterioles show hyaline degeneration and elastic hyperplasia. In benign hypertension the changes in the kidneys are those of benign nephro-sclerosis.

(7) *Heart* :—There is marked hypertrophy of the heart, more particularly on the left side. As a result of coronary artery involvement, there may be multiple areas of fibrosis in the myocardium.

Symptoms :—Benign hypertension may be asymptomatic for years. In fact many such patients get to know about their elevated blood-pressure, only when they go to a doctor for some other purpose, *e.g.* a medical check-up, or an insurance examination.

Many hypertensive patients have a peculiar personality, which can be described as "sensitive," or "irritable." They are very irritable and easily fly into a temper at the slightest provocation.

There may be a few subjective symptoms, *e.g.* they get easily fatigued and lack energy to work. The patient may show symptoms of nervous exhaustion. There is insomnia, or the sleep may be disturbed. And they get up with a headache which is usually occipital, sometimes, frontal, occasionally paroxysmal in character. Many patients complain of giddiness.

Cardiac symptoms, *e.g.* palpitation, breathlessness on exertion, attacks of angina pectoris, or even those resembling coronary infarction are very frequent. Later on, the patient may present clinical syndromes of (1) angina pectoris; (2) coronary thrombosis; (3) congestive cardiac failure and (4) hemiplegia.

Malignant hypertension may supervene on benign hypertension which may have lasted for years, or it may appear suddenly in an apparently healthy subject. In the former case, the subject is elderly, plethoric and well-built. In the latter case, the patient is under-nourished and anæmic. There is severe headache, and marked giddiness. Giddiness makes movements impossible. Suddenly the patient presents symptoms of (1) renal failure, (2) cardiac failure or (3) a cerebral catastrophe and the condition may end fatally.

Physical signs:—The heart apex is outside the normal limit. It is forcible in character, the second-heart sound is accentuated. Usually there is no murmur, but there may be a systolic murmur in the mitral, or aortic region. In advanced cases, there is a picture of congestive cardiac failure. The pulse is forcible, and of the high tension type. Arteries are thickened and tortuous. There is elevation of blood-pressure, from 140 to 200 systolic, and 90 to 100 diastolic. In malignant hypertension the blood pressure various from 200 to 300 mm. of Hg. systolic, and 100 to 150 diastolic. Fundus shows papillœdema, exudates or hæmorrhages. The urine is of low specific gravity and contains albumin, red cells, and hyaline, or granular casts.

Diagnosis:—The most important diagnostic aid of essential hypertension is *persistent* elevation of blood-pressure—systolic above 150 mm. of Hg. and diastolic above 90 mm. of Hg. There may be rise of both systolic, and diastolic readings, or only of systolic, or of diastolic pressure. It is frequently difficult to differentiate between the benign, and malignant forms. Persistently high blood-pressure readings, and retinoscopy will help in the differentiation.

Essential hypertension also should be differentiated from hypertension secondary to renal disease. In the latter condition, renal changes precede retinal changes, while in the former retinal changes precede the renal changes.

Complications:—The common complications met with in essential hypertension are: (1) cardiac failure, (2) coronary thrombosis, (3) renal failure, and (4) cerebral vascular disturbances. It is in one of these four ways that the end comes.

Prognosis:—The prognosis depends upon:—(1) the nature and the height of blood-pressure reading, (2) the degree of retinal involvement and (3) the complications that arise.

(1) Of the two blood pressures, the diastolic rise is of greater significance, indicating increased peripheral resistance, as compared to the systolic rise. If the diastolic pressure is above 125, the prognosis is grave. Similarly a persistent systolic pressure above 220 is of grave import. It may be stated that asymptomatic hypertension affords the best prognosis. Such patients can lead a normal useful life for years. In as many as 80% of cases, the survival rate is 20 to 25 years. In only 2% does the benign hypertension change into a malignant one, and then the survival rate is under two years.

(2) Retinal changes have great significance in prognosis. When the retinal changes are mild, 80% of the patients lead a normal healthy life. When they are moderate, 35% cases are healthy, and if they are severe, only 9% of the patients live longer than 2 years.

(3) Once complications start, the outlook changes. Of the patients in whom there is myocardial failure as a result of hypertension, hardly 25% are alive at the end of 10 years. Similarly those who get coronary thrombosis, show a survival rate of 25% by the end of 10 years. The survival rate of patients getting renal or cerebral complications is only 15% at the end of 10 years.

Treatment:—The treatment of essential hypertension may be divided into:—(1) psychological, (2) dietetic, (3) medical, (4) symptomatic, and (5) other lines of treatment.

(1) *Psychological*:—We have seen that one of the most important contributing factors in essential hypertension is emotional conflict. Most of these patients are sympathicotonics, *i.e.* have an irritative nature. Emotional conflicts throw them out of gear, causing hypertension. Psychotherapy directed towards overcoming these conflicts is essential. Psychotherapy does not mean consulting a psychiatrist, or remaining under his treatment. The family physician himself could do a lot. He should try to find out the sources of conflict in his patient and should make the patient understand the factors which bring about hypertension, and how best they may be avoided. Thus seeking his co-operation, the patient would try to adopt a placid temperament, and make the best of the prevailing surroundings.

If possible the patient should be removed from all sources of emotional irritation, whether domestic, financial, or from business

worry. Friendly jovial company, a short holiday, and complete relaxation for one day every week will also help him in lowering his B.P. and in taking a lighter view of his mental worries.

The success of psychological treatment will be most marked in early cases of hypertension, where spasm of the arteriole is the main factor. When irreversible changes have occurred, psychological treatment may not help him in understanding his blood-pressure, but it will certainly help him in understanding his own personal problems and their relation to his hypertension. He will thus be helped in avoiding mental irritation, which brings on hypertensive attacks, and which may precipitate serious cardiac or neurological complications.

(2) *Dietetic*:—We have already noted that many hypertensive patients are obese. Diet restrictions to diminish the extra-deposits of weight are essential. But the reduction in weight should be gradual. Marked diet restrictions should be avoided. Try to reduce the patient's weight to a level slightly below the average for the age and sex. For this purpose a diet of total caloric value of 1600 calories is to be preferred. It should contain adequate amounts of proteins and vitamins.

It is not necessary to ask the patient to give up smoking completely. Moderate smoking is not harmful. Similarly a small regular intake of alcohol is beneficial. If the patient can dispense with these items without any difficulty, they are best avoided. Otherwise complete abstinence might induce other conflicts in the patient, which may perhaps be more harmful.

As for sodium restriction—allow sufficient salt (200 mg. in 24 hours) to make food palatable. Salt-free diets are not palatable and to continue such diets over prolonged periods is impossible in the majority of patients.

(3) *Drugs*:—A large number of drugs are now used in the management of essential hypertension:—

(*a*) Bromides:—Bromides have been in use for ages. They act mainly as a nervine sedative. Usually a combination of the three bromides of sodium, potassium and ammonium acts better, especially when combined with valerian. But they have three disadvantages. They often produce much drowsiness, and thus interfere with the normal routine of the patient. When continued over prolonged periods, they lose their effect and have to be used in larger doses; they are habit-forming. Still they are time-honoured remedies for hypertension.

(*b*) Vasodilator drugs:—Nitrites in one form or other are very widely used in treatment. They are esteemed for their hypotensive action which however, is short-lived. They frequently cause headache.

The common preparations used are:—

(1)	Sod. Nitrite	... 30 mg. t.d.s.
(2)	Erythrol Tetranitrate	... 30 mg. ,,
(4)	Mannitol Hexanitrate	... 30 mg. ,,

Thiocyanates are toxic drugs to be cautiously used. Their main indication is the intractable headache, vertigo, tinnitus, or other signs of encephalopathy. The dosage is 200 to 360 mg. per day in divided doses (3 to 4 days) then 300 mg. per week as a maintenance dose. They act by bringing about relaxation of the smooth muscles of the arterioles by a nitrite-like action.

(*c*) Autonomic nerve blocking agents:—These are now in vogue and may be divided into:-(i) Central autonomic depressants; (ii) Ganglion blocking drugs; and (iii) Sympatheticolytic drugs.

(i) Central autonomic depressants:—The newest drug of this type is Apresoline. It acts on the midbrain, by inhibiting the impulses which stimulate the sympathetic nerves It is used orally; 25 mg. on the first day, 50 mg. on the next and then increasing the dose up to a maximum of 150 mg. per day. It should be used very cautiously when there is renal damage. A report on the results of its use in India is awaited.

Veratrum alkaloids also belong to this group. The dose is 3 to 5 mg. thrice a day orally. Its most effective application is in cases of acute hypertensive crisis, when it is given I.V. starting with ¼ cc. and gradually increased to 1 cc. at intervals of 6 hours. There is an immediate drop of blood-pressure, 20 to 30 mm. of Hg., in systolic, and 10 to 20 mm. in diastolic. Its effect lasts from 3 to 4 hours.

(ii) Ganglion-blocking agents:—They act by blocking the impulses from passing through the sympathetic ganglia, *i.e.* they act by chemical sympathectomy. In this group are the methonium compounds, which are salts of the chloride, bromide, iodide or tartarates of hexamethonium. The dose is 125 mg. three or four times a day by the intramuscular or subcutaneous route, when they produce an immediate fall in B.P. lasting from 4 to 6 hours.

(iii) Sympathetic agents:—Here the blocking effect occurs at the ending of the sympathetic fibres in the vascular tree. To this group belongs Priscol given in doses of 50 mg. I.V. This drug is not of much value as a hopotensive drug. Hydrogenated ergot preparations, (like Hydergine, 1 to 2 cc. I.V.) help to reduce the blood-pressure, but the results of its study in this country are awaited.

(*d*) Rauwolfia group of drugs:—The rauwolfia group of drugs are most important in the treatment of all forms of hypertension. Of all the drugs discussed here they are the most important, and in combination with bromides they serve the purpose in about 85% to 95% of cases of hypertension.

Serpina was introduced in the therapy of hypertension about 20 years ago. To-day there is no doctor in India who has not used this valuable drug at one time or another, which by itself is a compliment to the value of this drug in the therapy of hypertensions. Its popularity is due to (1) safety in administration even when the drug is prescribed over months, or when taken in larger dosage as it does not cause serious toxic reactions, or after-effects; (2) its being non-habit forming; (3) its definite hypotensive action—very rarely do we find cases where the drug has not acted; (4) the marked symptomatic relief even in cases where the hypotensive effect is not great; and (5) its mild sedative effect which is an added advantage, as it allays mental worry.

But it has certain disadvantages also. The different batches of the drug show widely varying clinical effects. Sometimes the drop in the blood-pressure may be so great as to cause alarm, and the therapy may have to be discontinued. In others the hypotensive effect may be very slight. This is because of the variations in the different alkaloids of the particular sample. The whole root also contains some alkaloids which raise the blood pressure. Thus the therapeutic efficacy varies greatly. Another disadvantage of Serpina is its sedative effect. The sedation may be so marked, as to interfere with the normal activity of the patient. The patient feels reluctant to use the drug over long periods, as it interferes with his daily avocations.

(4) *Symptomatic treatment*:—Two symptoms sometimes prove very troublesome requiring specific treatment: (*a*) Headache—sometimes proves very severe. Elevation of the head of the bed for 4 to 6 inches, ice-cap on the head, lumbar puncture may all have to be tried. In intractable cases thiocyanates often prove to be of value. (*b*) Insomnia is another symptom; lumbar puncture, a cup of hot milk, sedatives, and hypnotics should be given a fair trial. Paraldehyde 7 to 10 cc. intragluteally is often helpful.

(5) *Other lines of treatment*:—Under this heading may be mentioned: (*a*) Intravenous hypertonic saline which often helps in reducing blood-pressure. Reduction of intracranial tension may relieve headache, and induce sleep. The hypotensive effect may last up to 2 hours or more. 300 to 500 cc. of 50% saccharose solution slowly given intravenously is useful. (*b*) Venesection:—Removal of 500 cc. of blood has been tried in malignant hypertension, and when there is a marked rise of systolic and diastolic pressures. This affords only temporary relief. (*c*) Surgical treatment will not be discussed here; (*d*) Lumbar puncture: Often helps in reducing marked increase of intracranial tension. It will thus be of value in intractable headache, insomnia, and in impending encephalopathic syndromes.

Summary.—(1) The anatomical and physiological bases and the mechanism of hypertension are discussed. (2) The ætiology, clinical types, pathology, symptoms and signs, diagnosis, prognosis and complications of essential hypertension are considered. (3) The treatment of hypertension is discussed in detail. (4) The value of the Serpina group of drugs like Serpasil in the treatment of essential hypertension is indicated.

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EXTRACT OF RAUWOLFIA SERPENTINA IN HYPERTENSION

As part of a broad investigative approach to the therapy of hypertension, Ford and Moyer of Houston, Texas, treated a number of patients with essential hypertension in the out-patient clinic of the Veterans' Administration Hospital and in their private practice. The patients were divided into 2 groups. Group I consisted of 42 patients who received only oral Rauwolfia extract. Group II consisted of 25 patients who were treated with Rauwolfia extract *plus* hexamethonium. Six of these first received Rauwolfia extract which was later supplemented by Hexamethonium. The other 19 first received hexamethonium and then supplemented by Rauwolfia extract.

The patients responding to Rauwolfia extract alone were those whose hypertension was apparently early or mild and who presented a few or none of the complications of the hypertensive state. Of the 25 patients who were unresponsive to the extract alone, 23 had abnormal ECGs and the frequency of renal cardiac or cerebral complications was two or three times as great as in those who did respond. Of the 17 who were responsive to the extract alone, only 6 had abnormal ECGs.

The side-effects noted with hexamethonium are frequently a hindrance to its acceptance by the patient. On the other hand some of the more pleasant side-effects with Rauwolfia extract make it difficult for the clinician to control his enthusiasm—even when there is little or no B-P reduction. These also help him to continue the therapeutic battle when the B P does not respond to the extract alone, by allowing him to add a more potent hypotensive drug like hexamethonium. With Rauwolfia extract alone, practically the only distressing side-effect was nasal congestion, which was only temporarily relieved by nasal drops (Neosynephrine). The gain in weight is probably attributed to the same mechanism that produces increased appetite, a sense of well-being and relaxation ; with hexamethonium alone, constipation, even to the point of serious partial or segmental ileus, is the greatest problem. Faintness especially during the initial three months, is also distressing and almost universally present. The cerebral tranquilizing action of Rauwolfia extract may mitigate some of the faintness, due to hexamethonium by stabilizing the wide fluctuations in B.P. The effect of the extract in increasing intestinal motility works nicely in antagonism to the constipating effects of the hexamethonium, as a ganglion-blocking agent. The extract can safely be used in all cases of hypertension.—(*G.P.*, Nov. '53).

MODERN CONCEPTION OF MARASMUS*

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THE expression 'marasmus' is ordinarily used to denote a stage in the process of severe undernutrition peculiar to infants, having a wide variety of signs and symptoms but sufficiently characteristic and well-defined to form a clinical entity. It is not a disease but a symptom complex. The condition has been variously described in medical literature, much to the confusion of the general practitioners *e.g.*, atrophy, dystrophy, athrepsia, decomposition etc. The practitioner who has been led to think in terms of Atrophy, Dystrophy etc., is commonly bewildered, not knowing how to classify his patient in order to give him the proper treatment. To the practical physician it matters little, if he does not remember these high sounding names and the tiring list of symptoms, so long as the pathogenesis and the cardinal features of the condition are not lost sight of.

Classification.—The various forms of malnutrition—like atrophy, dystrophy, marasmus etc. may be best considered as merely stages of the same condition. For the sake of convenience one may consider an infant as essentially normal who is within 10 or 15% of the average weight for his age ; the terms dystrophy, undernutrition may be applied to infants 20 to 40% below the average weight, and the term marasmus (negative nutrition) to an infant more than 40% underweight. The course of marasmus is never acute. No child jumps all of a sudden from a condition of perfect health to a marasmic one, but only drifts slowly and steadily through a series of stages till the miserable state is reached. For a better understanding of these stages, the concepts of Finkelstein shall be used. Eutrophy (health)—(1st stage) Dystrophy (mild undernutrition). In this stage growth is still taking place but at a slower rate than normal and the subcutaneous fat is reduced considerably but still present—(2nd stage) Atrophy (marasmus). Here growth has ceased completely and subcutaneous fat is practically gone—(3rd stage) Malignant undernutrition or decomposition where body weight is lost rapidly inspite of adequate food.

This classification has a prognostic and therapeutic importance. The 1st stage responds rapidly to treatment. In the 2nd stage successful treatment is difficult and in the 3rd stage the electrolytic equilibrium is completely lost so that it is extremely difficult or impossible to reverse the process leading to death.

Aetiology and pathogenesis.—The primary and essential cause of marasmus is inadequate utilisation of food required for the

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maintenance of growth. This defective utilization of food may be brought about by a variety of conditions *viz.*: (1) Inadequate supply of food (underfeeding) (*a*) Quantitative: Insufficient quantity of milk supplied, or milk rejected as in vomiting—*e.g.* rumination, pyloric stenosis etc., (*b*) Qualitative:—The milk supplied is too much diluted. (2) Poor digestion and absorption of an otherwise adequate diet: *e.g.* Prolonged diarrhœal conditions, both enteral and parenteral. (3) Defective utilization of food after absorption:—Chronic infections *e.g.* Tuberculosis, syphilis, chronic-meningitis, empyema etc. (4) Effects of congenital abnormalities:—In certain cases infants fail to grow inspite of adequate diet in the absence of any infection discoverable either during life or at necropsy. In such cases, constitutional weakness may be properly applied. In other instances congenital anomalies such as, rudimentary kidney, atrophic gastrointestinal mucosa, or an anomaly of the vascular or nervous system, which account for the nutritional failure, may be found at autopsy. Other congenital anomalies such as congenital heart disease, atresia of the gut etc. which are easily recognised during life, produce faulty utilization of food.

Amongst the various causes listed above, underfeeding either qualitative or quantitative, tops the list in producing malnutrition.

How underfeeding leads to a marasmic state needs discussion. Most frequently the underfeeding is more or less intentional to start with, on a therapeutic basis, although such therapeutic underfeeding for periods long enough to produce marasmic condition is never justified. Perhaps therapeutic underfeeding is initiated commonly in instances in which moderate diarrhœa is present due to chronic upper respiratory tract infection. The presence of the infection or its relationship to the digestive disturbance is not suspected. The digestive disturbance is the outstanding feature, and the dietary management is directed towards decreasing the food to get within the tolerance of the infant. As undernutrition increases, the infant becomes less able to assimilate food and may even have starvation diarrhœa. The diarrhœa may be interpreted as an indication for further reduction of food and thus a vicious circle is set up.

The erroneous belief that undernutrition is caused by absolute or relative overfeeding, has undoubtedly been responsible for much underfeeding. Changing the milk formula by decreasing one or other constituent, on the assumption that this or that component has been responsible for the stomach upset, often results in underfeeding. When attention is centred entirely on the digestibility of food and the character of the stools, the energy needs are often overlooked.

Sometimes mothers have fantastic ideas about a satisfactory diet for an infant. Cases are encountered everyday where infants are kept solely on a diet of barley water for months, and it is not

surprising that symptoms of marasmus develop sooner or later. This phenomenon-feeding is probably therefore, the most important cause of marasmus in India and is the outcome of sheer ignorance of the fundamental principles of nutrition.

Infants show nutritional disturbances from lack of proper balance between protein, fat and carbohydrate. Protein deficiency has been described in Germany under the name of '*Milchnahrschaden*' (nutritional deficiency due to flour feeding). This condition is produced by overfeeding with cereals. This name was given on the erroneous assumption that the nutritional injury was caused by starch, whereas actually the cause is starvation. A similar condition has been described recently under the name of 'Kwashiorkor' which is a syndrome due again to protein-deficiency.

It is usually stated that diets high in protein are well tolerated. Growth, however, is not satisfactory when over 20% of the calories is derived from protein. Theoretically, protein might be substituted to a large extent for carbohydrates, since glucose can be readily formed from about half the aminoacids. However, clinical observation indicates that growing infants do not thrive on diets low in carbohydrate. When unmodified whole milk is given over a long period, young babies develop a well pronounced clinical picture of 'milk atrophy' (*Milchnahrschaden*). The condition is readily corrected by increasing the sugar-intake.

Clinical pattern.—1. *General appearance*:—The general appearance is dependent on the amount of wasting of subcutaneous tissue and muscles together with the psychic changes. The loss of subcutaneous tissue is never precipitous. The fat is gradually used up at varying rates from different parts of the body and follows a definite pattern The fat from the abdomen and breast tends to disappear first and then from the shoulders, arms, legs and buttocks in that order. The fat of the face is the last to disappear while that of the sucking pads is preserved until death. Keeping in mind the order and degree of fat loss, an evaluation of the progression of the disease can be obtained. Until the fat of the buttocks is completely lost restoration of the healthy state is not very difficult. When the eyes are sunken and the sucking pads are prominent, treatment becomes extremely difficult.

After the fat depots become exhausted, more vital structures of the body are destroyed in order to supply energy. The proteins of muscles, blood and other organs are utilized as fuel with the result that the circulation becomes poor, the intestinal pattern becomes visible and in the advanced stage the bones appear to be covered with skin devoid of muscle and fat.

2. *Psychic reaction*:—As undernutrition develops the majority of infants show psychic reactions. At first they are irritable and cry a good deal. It is difficult to make them smile. As the condition progresses, periods of somnolence and apathy occur between

crying spells. In the final stage the cry becomes weak and whining or the baby lies in a semistuporous state with eyes half closed or fixed. These psychic changes have an important bearing on the prognosis and results of therapy. The appetite is good in the early stages but disappears gradually. A child who has no appetite and cries continuously, should be considered to be in a serious condition. If, with treatment the child is more comfortable, and sleeps well, the child is undoubtedly progressing favourably. In the management of a case, the physician should always make it a point to enquire from the mother about these psychic changes. The use of the stethoscope may be forgotten but one cannot afford to forget enquiring into the mental state of the patient.

3. *Resistance to infection*:—Malnourished infants have little resistance to infection. Probably they do not have more frequent infections than a normal baby, but trifling infections produce disastrous results. Complications in the form of parenteral diarrhœa, is the rule with infection in a marasmic baby. The diminished resistance to infection persists when a gain in weight leads one to infer that recovery has taken place. In other words, the subcutaneous fat may be restored, to give an appearance of health, but an infection quickly reduces him back to his former marasmic state. In this sense, resistance to infection is one of the best means of assessing the state of nutrition.

4. *Reaction to fasting*:—In marasmus, unlike normal babies, a day of starving may lead to failure to gain in weight for several weeks. These reactions are due to extreme hydrolability of the wasted babies. The high water requirement of these babies is chiefly related to the peculiar renal function characteristic of infants only. For instance, infants need 90 to 115 cc. of water per 100 calories, while children require only 60 to 115 cc. of water for every 100 calories.

5. *Food tolerance*:—In normal babies, when an increasing amount of food is given, there is a level called 'maintenance level' when the body weight remains more or less stationary without much loss or gain in weight. With further increasing amounts of food, there is gain in body weight up to a certain point called the 'tolerance level,' beyond which disturbances occur and the weight tends to fluctuate or actually begins to fall. Somewhat between the 'tolerance level' and the 'maintenance level' is the level of optimum intake and the physician must find this to treat the condition successfully.

The first indication that the 'limit of tolerance' is being approached, is given by the fact that the rate of increase in weight is slowed. It must be remembered that absence of a gain or loss of weight may occur without vomiting or diarrhœa.

In marasmus, the level of tolerance, unlike normal babies, is much nearer the level of maintenance-intake, so that slight variations in the intake of food lead to catastrophe. In more severe cases, the level of tolerance, more or less coincides with the level of maintenance; gain in weight, therefore, becomes extremely difficult with diet alone. In extreme cases, the limit of tolerance is below the level of maintenance so that there is always loss of weight in spite of food and parenteral fluid therapy is essential for the management of such cases.

In general, after the tolerance to food is reduced, it tends to increase when food is given in such small quantities as to lead to no untoward symptoms, such as loss in weight. It must be borne in mind that excessive starvation will decrease the tolerance level.

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THE UNDERWEIGHT CHILD

Too stern a discipline in an attempt to 'feed up' a child with an undue insistence on finishing too large helping of a dull or distasteful dish often sows the seed of revolt. The mother who, on no very firm dietetic grounds, is convinced that her child "cannot tolerate fat" or is sensitive to 'acid foods' runs the risk of having to cope with a young-striker sooner or later. In contrast to this iron discipline and lack of imagination, are the total lack of discipline and too obvious maternal anxiety.

The treatment of these young underweight children is very simple; the treatment of the parents often very difficult. The children invariably eat normally and gain weight if fed in a fairly large group of normal children served by trained personnel who do not express any emotional response, either of disappointment at refusal of food or delight at its acceptance. The whole business of eating is treated as a matter of routine. This child simply copies the other normal children and ceases to be underweight.

The problem of the mother remains to be solved; the success of treatment of the child often arouses feelings of inadequacy in the mother or even feelings of resentment against her own child who will take food from strangers, and not from her. The peculiar emotional relationship of child to mother must be explained in suitably closer terms and the mother instructed and reassured.—(Dr. A. D. C. Bell of the London Charing Cross Children's Hospital in *Practitioner*, October 1954).

The medical profession should be made up of men who are not afraid to take their place in the community.—(Julian Price, M.D.).

DIFFERENTIATION OF CARDIAC AND NON-CARDIAC CHEST PAIN

The necessity for the evaluation of chest pain presents itself to every physician. In recent years, because of the lengthening life-span and because of our broadening knowledge of coronary disease, the need for differentiation of cardiac and non-cardiac chest pain has increased. The patient with a suggestive history and a negative resting electrocardiogram may or may not have heart disease. In certain complicated situations heart disease may exist but chest pain may come from functional or other organic disease.

Master, Jaffe, and Pordy, report on a valuable statistical study (*Ann. Int. Med., 41:* 315, August 1954) of "diagnostic criteria" from the histories of 200 consecutive private patients who complained of chest pain. Half of these had coronary disease with an abnormal resting electrocardiogram. The other half were considered free of heart disease because of a normal resting electrocardiogram and a negative double "two-step" test, and also, because none of these latter patients developed a coronary insufficiency or occlusion during a four-year period of observation. Eighty of the non-cardiac cases suffered from some functional disturbance. In the majority, the diagnosis was neurosis, and in the remainder, neurocirculatory asthenia, uncomplicated hypertension or hypotension, or paroxysmal arrhythmia. The remaining 20 patients were found to have arthritis, gallbladder disease peptic ulcer, or hiatus-hernia.

The chest pain was considered as to onset, location, type, radiation, duration, and relief by nitroglycerin. Many cases of anginal and functional pain were found to be atypical. Many cardiac patients did not exhibit any of the characteristic pain patterns. On the other hand, patients in the group having functional pain were found to have pain substernal in location, onset with effort, and relief by nitroglycerin.

Chest pain has usually been regarded as cardiac in origin if "(1) it was induced by effort, (2) its location was substernal, (3) it was constricting or oppressive in type, (4) it radiated into the left shoulder or arm, (5) it was of short duration, (6) it was relieved by nitro-glycerin." Non-cardiac chest pain has usually been considered as existing if "(1) it occurred at rest, (2) its location was in the left chest, (3) it was aching in quality, (4) it did not radiate, (5) it was of long duration, and (6) it was not relieved by nitroglycerin."

Master found that exceptions to the pathognomicity of the six criteria ranged from 15 to 40%. For instance, in 30 patients with coronary disease the pain was precordial, while in 23 patients with functional pain it was substernal. Anginal pain on effort appeared in only 90% and may have been induced only by some very specific exertion. In 23 patients, walking did not evoke the anginal syndrome. In 31, it occurred at rest as well as on effort and was not relieved by nitroglycerin in 10 to 15%. On the other hand, 34% of the functional patients developed pain of effort, and in only 25% of these was it induced by emotion. In these functional patients, nitroglycerin relieved the pain in more than 10 of the 27 who employed it repeatedly.

The physician cannot therefore, rely on any one, or even three of the criteria of chest pain usually regarded as diagnostic for angina. The mistaken interpretation of a pain as anginal in a patient who actually has functional pain is a serious matter. A cardiac neurosis established by such an error could be relieved only with great difficulty. Aside from the cardiac neuroses, chest pain may be due to such organic conditions as spondylitis, arthritis, neuritis, fibrositis or myositis, hiatus hernia, gallbladder disease, peptic ulcer, chronic lung disease, and pulmonary hypertension.

With due caution and with the criteria given above, a proper diagnosis can usually be made. When doubt exists, further reliance may be placed on the performance of the Master's double two-step test, and on adequate long continued observation. By such means, physicians may, on the one hand, reduce the number of instances of iatrogenic heart disorder, and the number of cases of heart disease not properly diagnosed on the other.—(Editorial in the *J. Louisana St. Med. Soc.*, Oct. 1954).

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PROGRESS IN THE STUDY OF MODERN THERAPY THROUGH HALF A CENTURY

(Continued from page 125 of Feb. '55 issue)

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PART II

Anti-malarial drugs.—Ever since cinchona bark was introduced into Europe from Peru in 1632 A.D. by the Spanish Jesuits, the so called "Jesuit's bark" has become one of the most recognised drugs for the treatment of fevers all over the world. In India it was first used by Bogue in 1657 in the "fatal fevers of the rainy season." In course of time its most important alkaloid quinine became the specific drug for malaria. The bulk of the world's requirements of quinine came from Java. With the Japanese occupation of the Dutch East Indies during the second world war, this source of supply was lost to the allied nations who were deprived of one of the most essential drugs required for the armies in the Pacific zones and on the Burma front. So the allied nations had to find other potent and suitable anti-malarial drugs.

Fortunately the first of the synthetic anti-malarial drugs Plasmoquin (Pamaquin) a gametocidal drug had already been discovered in Germany by Schulemann, Schœnhœfer and Wingler in 1926 which was followed by further synthetic production of Atebrin (Mepacrine) by Mauss and Mietzch in 1933. This was further studied in England and the product Mepacrine proved a great success as a substitute for quinine during the last world war. Atebrin a similar drug was introduced in U.S.A. This stimulated further research and soon other perhaps more potent anti-malarial drugs came to be discovered.

Atebrine (Atabrin, Mepacrine, Quinacrine).—Atebrine possesses many advantages over quinine. It is markedly localized, especially in leucocytes, liver, spleen, heart and lungs; and is moreover excreted very slowly and is found in the urine even eight or nine days after a seven days' course and the plasma concentration persists up to fifty per cent even a week after the last dose. Just like quinine it acts principally on the asexual erythrocytic parasites. Its action on Plasmodium vivax is not as rapid as on *P. falciparum*. It has no action on the persistent exo-erythrocytic stages of *P. vivax*, so that relapses occur usually 4 to 6 weeks later. Like quinine it has no action on the gametocytes of *P. falciparum*. As a prophylactic it is now known that atebrine has no causal

prophylactic action; but it effectively suppresses erythrocytic parasites and this suppressive action continues for about four weeks after exposure to infection and may permanently prevent overt malarial fever from *P. falciparum*. But resistant strains may be present. On the other hand *P. vivax* and *P. malariae* infections reappear after the drug is discontinued. Unpleasant side-effects are yellow discoloration of the skin, sometimes lichenoid eruptions and also aplastic anæmia which is rare. It is a cortical stimulant and may sometimes produce mental disturbances—the so-called mepacrine psychosis. The loading dose recommended to 0·6 to 0·9 g. a day; the maintenance dose is 0·3 g. daily and the suppressive dose is 0·1 g. daily. Atebrine musonate is available for parenteral administration.

Proguanil (Paludrine).—Although as with atebrine there is considerable localization in the erythrocytes, leucocytes, kidneys and liver, Proguanil unlike atebrine disappears rapidly from the blood plasma after full dosage; but there is some evidence that it partly converted into an active metabolic product. In P. falciparum infection it is very effective as it acts as a satisfactory causative prophylactic and usually cures the infection. A few strains of P. falciparum, however, exhibit some degree of resistance and for this some recommend a much more rapidly effective drug, such as atebrine which should be used for the first day of treatment to be followed by proguanil at a dose of 0·1 g. daily for six weeks. It is also, to a less extent, effective against P. vivax and it is claimed with some justification that it has some action against the pre-erythrocytic stages, but it does not eliminate all the parasites. It is not so promptly effective in acute attacks of *P. vivax* malaria; and relapses are just as common as after atebrine medication. The available evidence shows proguanil to be effective in acute attacks of quartan malaria and to render *P. falciparum* gametocytes non-infective to mosquitoes. Unfortunately it has been conclusively demonstrated that under proguanil treatment acquired resistance of both *P. vivax* and *P. falciparum* may take place. It has a very low toxicity; but nausea, vomiting, diarrhœa and mild hæmaturia have been reported under prolonged treatment with large doses. The usual dose recommended for therapeutic purposes is 0·3 g. twice daily for ten days. For suppressive use 0·3 g. once weekly, 0·2 g. twice weekly or 0·1 g. daily. It can also be used intravenously in a dose of up to 100 mg. and for intramuscular injection up to 400 mg.

Chloroquine (Aralen, Resochin, Nivaquin).—Chloroquine also gets localized in the body in the liver, spleen, kidneys, lungs and leucocytes, and is slowly excreted. Its principal action like quinine and Atebrine is against asexual erythrocytic parasites and so it controls malarial paroxysms promptly; it does not however, affect the persistent exo-erythrocytic stages. Consequently *P. vivax* relapses are not prevented, but only delayed for at least 7 to 10

weeks after treatment; whilst P. falciparum infections are controlled radically, though it has no action on the crescents. It has no the action against the pre-erythrocytic forms and is therefore not such an efficient causal prophylactic as Paludrine. It may act just as a suppressive prophylactic against all three forms of malaria. It can be injected intramuscularly in the form of chloroquine hydrochloride. Toxic effects are very few; but very occasionally blurring of vision, pruritus, mild headache and gastro-intestinal disturbances have been reported. As its maximal concentration is in the liver, it destroys the trophozoites of E. histolytica in amœbic liver abscess and hepatitis. But there has been no proof of any direct action on the parasites. Its remarkable effect on amœbic hepatitis has been amply demonstrated, although it has no corresponding effect on intestinal amœbiasis.

Chloroquine diphosphate is given in a dose of 1 g. as the loading dose and 0·5 g. once daily up to a total of 2·5 g. in three days. As a suppressive measure 0·5 g. may be given once a week.

Camaquine.—It is rapidly metabolised in the body and its degradation products are chemotherapeutically active, but are slowly eliminated. The plasma concentration is reduced at the rate of 50 per cent per week. Its anti-malarial activity is the same as that of chloroquine. It is well tolerated and the side-effects are lassitude, anorexia, and insomnia when the drug is continued in large doses for a long time.

Pamoquine. (Plasmoquine, Praequine).—It has a relatively weak action on the asexual erythrocytic parasites, but it destroys the persistent forms responsible for relapses of *P. vivax* and this property is enhanced by the simultaneous administration of quinine. Pamaquine is localized to a moderate degree in the liver, lungs and brain and is quickly metabolized; but its action is markedly altered by concurrent administration of atebrine or proguanil, leading to a much higher plasma concentration than with corresponding doses of pamaquine alone. In toxic doses pamaquine will destroy the pre-erythrocytic forms of *P. vivax* and *P. falciparum*, while small doses, say 30 mg. daily for 8 days, will eliminate the gametocytes of *P. falciparum*. It produces methæmoglobinæmia, which, if of sufficient degree, may be accompanied by cyanosis. Abdominal cramps are common. Acute intramuscular hæmolysis leading to methæmoglobinuria sometimes occurs. It is of great importance that combined treatment with atebrine or sulphonamides should be avoided in all 8-aminoquinolines. It is not useful as a suppressive.

Pentaquine acts in the same way as pamaquine and so also does Iso-pentaquine.

These synthetic drugs evolved during a period of emergency and unavailability of quinine, have been a great boon to mankind. It must however, be recognised that quinine possesses certain

virtues which are not exhibited by the numerous synthetic products much publicised today which are certainly useful up to a point. In severe and critical cases of malaria, quinine is still the drug of choice where rapidity of action is alli important.

ACTH and Cortisone.—Of all the modern wonder drugs ACTH and Cortisone are the most outstanding ones. At first they promised a great deal; but the original enthusiasm has cooled with more and more experience when their limitations became quite apparent. Nevertheless their usefulness in certain conditions cannot be ignored.

ACTH is liberated from the anterior pituitary when the latter is stimulated by a hormone from the hypothalamus. ACTH then causes the release of the preformed adrenal cortical hormone from the gland. In order to understand the action of ACTH, it is necessary to understand Selye's concept of "alarm reaction," which postulates that fundamentally disease is an expression of the response of the body to stress—psychic, somatic, or traumatic. It has been observed that jaundice and pregnancy cause temporary amelioration of the symptoms of rheumatoid arthritis; and, it was Hench of the Mayo Clinic who reasoned that the excess of biologically active steroids that occur in these conditions is responsible for the temporary beneficial effects on rheumatoid arthritis and who first successfully treated acute rheumatic fever with Cortisone. A similar result was obtained by Thorn *et al* in 1949 by using ACTH.

ACTH is obtained from the anterior pituitary gland, when the latter is stimulated by a hormone from the hypothalamus, whereas Cortisone (17-hydroxy-11-dehydrocortico-sterone, or Kendall's compound E) is obtained from the adrenal cortex. The richest source of ACTH is the pituitary gland of domestic animals; the pig yields the largest quantity. As ACTH is effective by virtue of its property of releasing performed adrenal cortical hormone, it can act only in the presence of an intact adrenal gland; whereas cortisone acts entirely independently of adrenal cortex and is thus effective in patients suffering from Addison's disease, while ACTH is not effective in such a condition. Cortisone is synthesized from bile acids by the adrenal cortex.

Therapeutically then, ACTH represents stimulation therapy, whereas Cortisone represents substitution therapy as this represents the natural adrenal cortical hormone. Their mode of action however, is not very clear; they are effective only so long as the therapy is maintained, These two corticoids appear to inhibit tissue reaction to a noxious agent; but can do little to prevent invasion. It has also been suggested on experimental evidence that both act at the cellular level and thus protect the cells against the destructive changes caused by injurious agents. Both ACTH and Cortisone may reverse even the process of necrosis in the cell. Their beneficial effect is due to their direct action on the cell as

recently demonstrated in acute rheumatic fever, and not to any interference with their antibody formation or antigen-antibody reaction. Under these therapy in acute rheumatic fever not only is there subsidence of inflammation, but there is also a fall of temperature, a decrease in pain and a decrease in the local inflammatory reaction.

Salt and water are retained at the tubular level on the administration of ACTH and Cortisone, the former more than the latter. It causes retention of water and sodium and increased excretion of potassium as also the chlorides which are sometimes retained. The dehydrated individual is more likely to show water and salt retention than the œdematous individual; and salt restriction tends to minimise water retention and may precipitate diuresis.

ACTH and Cortisone in excessive doses may cause alkalosis and hypo-potassæmia as manifested by muscular weakness, hypotension and changes in the electrocardiogram which are corrected by giving the potassium salt; and by their effects on sodium and chloride retention are responsible for œdema, ascitis, congestive heart failure and hypertension. They also cause an excessive breakdown of proteins and increased formation of amino-acids, interference with the synthesis of protein from amino-acids, increased urinary nitrogen excretion and consequently a negative nitrogen-balance. There is also a temporary increased excretion of uric acid which is probably due to an excessive break-down of protein and kidney-threshold for uric acid. Since the urinary creatinine is unaffected, the uric acid: creatinine ratio has been used as a criterion for measuring adrenal-cortical activity.

In regard to carbohydrate metabolism, the prevention of synthesis of protein from increased production of amino-acids causes their utilization for increased production of glucose (Gluconeogenesis). But this has no therapeutic disadvantage except in diabetic patients who may consequently require increased doses of insulin so long as ACTH and of Cortisone are administered. Their effects on fat are again gluconeogenesis; but ketonuria generally does not occur except in diabetic patients. When ACTH and Cortisone are administered for a considerable time, there may occur a re distribution of the general body fat. Such deposition of fat causes fat-pad on the back, rounded cheeks and increased abdominal fat. Other untoward effects are osteoporosis caused by a deficiency of protein matrix and interference with the absorption of calcium and phosphorus as well as increased excretion of these two substances. Further they cause atrophy and regression of lymphoid tissue,—reduction of lymphocytes and eosinophils and increase in the number of white cells and erythrocytes. Their effects on lymphatic tissues have produced beneficial effects on lymphatic leukæmia. Prolonged use of these two drugs may cause increased androgenic activity as manifested by acne, hirsutism and amenorrhœa in

women. Their action on the enzyme system from the clinical point of view, is an increase in pepsin and trypsin secretion with consequent aggravation of peptic ulcer. Even perforation of peptic ulcer is known to have occurred during treatment. But they have a beneficial effect on ulcerative colitis.

Such being the pharmacology of these new drugs, it is no wonder that they can be used in a wide variety of pathological conditions. They are not a specific cure in the sense that antibiotics are. ACTH stimulation of the adrenal cortex allows the cells of the body to function in a relatively normal physiological manner in many pathological situations. Although the exact mechanism of their action is not clear, these steroids act at the cellular level and protect the cells against inflammatory reactions and block allergic hypersensitivity reactions without affecting the agents responsible. It appears therefore, that their role is a suppressive one, causing subjective improvement and preventing symptoms to develop without exerting any effect on the disease process. It is something like holding the fort without defeating and destroying the invading army. Their mitigating influence is therefore, not permanent and wanes on the cessation of the therapy.

Indications for the use of ACTH and Cortisone are very varied. But since their usefulness is limited to the period of their use, they should generally be used to tide over some critical phase of a self-limiting disease. The best examples of such conditions are serum-sickness, drug-sensitivity, acute inflammatory and allergic diseases of the eye. They are also useful in acute conditions which are usually followed by the destruction of tissues, such as severe burns and acute rheumatic fever. They have a mitigating influence in conditions which produce physical disability; they prevent the morbidity in conditions like rheumatoid arthritis, acute gout etc., and endocrine dysfunctions such as adrenal cortical insufficiency, panhypopituitarism, adrenal androgenic hyperplasia and idiopathic hypoglycæmia. ACTH can act only in the presence of functioning adrenal cortex. In Addison's disease where the adrenal cortex is non-functioning or poorly functioning, ACTH does more harm than good. But Cortisone will act in these cases. If ACTH is used continuously for a long time, it may cause hyperplasia of the adrenal cortex and finally lead to exhaustion of the gland. Cortisone on the other hand depresses the formation of ACTH. Diseases in which degenerative changes have already occurred will not be benefited as ACTH and Cortisone have no effect on collagen which is already laid down, although it is claimed that recent minor destructive lesions may be reversible under the treatment.

In 1952, Soffer writing in the *Practitioner* recommended the use of ACTH and Cortisone as "short term" therapy as a life-saving measure in the following conditions:—severe burns, adrenalectomy for adrenal cortical tumour; as preoperative treatment; Waterhouse-Friderichsen syndrome; severe sickness; severe acute rheumatic fever; status asthmaticus resisting all other treatments; severe systemic infections; severe toxic pneumonia refractory to antibiotic therapy; severe generalised peritonitis in addition to antibiotic treatment; severe exfoliative dermatitis; and intractable post-operative shock.

It is, however, advisable to give antibiotics in addition to ACTH and Cortisone in the treatment of severe toxic pneumonias and other systemic infections, as ACTH and Cortisone do not cure such conditions but only suppress the symptoms and help the patient to tide over a crisis.

The conditions in which ACTH and Cortisone may be used are very varied even as regards their palliative mitigating effects. It is necessary, however, to stress that their use in certain diseases is contraindicated, in some relatively and in others absolutely. Under *relative* contraindications can be listed conditions like:—hypertension in which a further rise of blood pressure may occur due to retention of sodium chloride and water; congestive heart failure, in which there is a danger of further increase of decompensation due to the same cause; and severe diabetes for fear of causing an increase in glycosuria and hyperglycæmia. This is due perhaps to too rapid and excessive mobilization of energy sources from the three basic nutrients *viz.*, protein, fat and carbohydrate. The conditions which *absolutely* preclude ACTH and Cortisone therapy are:—(*i*) chronic glomerulo-tubular nephritis as they may cause further impairment of diuresis, œdema formation and nitrogen-retention due to sodium chloride and water retention. But it is reported that the nephrotic syndrome may respond favourably; psychosis and psychopathic personalities in a pre-psychotic state may develop into a full-fledged psychosis for reasons not clearly known; (*ii*) Cushing's syndrome, hirsutism as ACTH and Cortisone may cause increased signs and symptoms of adrenal cortical hyperfunction by the stimulation of the adrenal cortex; (*iii*) active peptic ulcer, as there is a possible risk of perforation due to increased secretory activity of the stomach; (*iv*) tuberculosis, active or recently healed; and (*v*) also syphilis, unrelieved septic focus, osteoporosis, diverticulitis, and acute bleeding tendencies which are also contraindications to their use.

When ACTH and Cortisone are used for long periods, some side-effects due to overdosage may occur which will disappear with the stoppage of the treatment. These are fullness of face described as 'moon face,' œdema, congestive heart failure, hypertension, acne, hirsutism, alkalosis, euphoria, insomnia, striæ, delay in the healing of wounds, pigmentation only with ACTH therapy, convulsions, depression, psychosis, diabetes mellitus, osteoporosis and transient adrenal insufficiency only with Cortisone therapy. Many of these complications resemble Cushing's syndrome. Hirsutism and acne

regress after the cessation of therapy; hypertension occurs more commonly in patients with renal or vascular disease. In others it is reversible and disappears after treatment is stopped Oedema, congestive cardiac failure and alkalosis can be controlled by a low salt diet, restricted fluid intake and giving potassium chloride 3 to 8 gs. daily. Menstrual disturbances such as amenorrhœa are common in women. Pigmentation once developed unfortunately persists.

In suitable cases ACTH and Cortisone administration gives a most dramatic response. The clinical picture changes rapidly; the fever, if any, subsides within 4 to 18 hours; pain disappears as also the stiffness in the joints and muscles and the patient gets a sense of well-being. The appetite is improved sufficiently for the patient to crave for more food. All inflammatory reactions and swellings clear up and mobility of the joints in rheumatoid arthritis is sufficiently, though only temporarily, restored.

One word of caution is necessary and that is the administration of ACTH must be discontinued if any unusual pain particularly abdominal, develops which is not a symptom of the disease. It is imperative first to find out the origin of such pain. Discontinuance of the drug, especially when the dosage is high must on no account be delayed as adrenal cortical hormones in excess tend to mask pain arising from whatever cause.

Apart from these criteria of clinical improvement there are certain laboratory procedures which indicate the response to the therapy. Reduction of the eosinophil count in the peripheral blood is the most sensitive indication of adrenal cortical stimulation. The Thorn test is based on this. Circulating eosinophils should be reduced 50% in 4 hours by one 25 i.u. dose. At present, this is the most practicable test for clinical purposes. Other changes are a reduction of elevated erythrocyte sedimentation rate and urinary excretion of 17-ketosteroids which closely parallels the extent of adrenal cortical stimulation under ACTH administration. Although the effects of ACTH are brought about by increased adreno-cortical secretion, certain differences have been shown in the clinical use of ACTH and Cortisone. Eosinophil depression is less consistent with Cortisone than with ACTH, tending to revert to pre-treatment levels during continued therapy. Sodium retention occurs more regularly with ACTH than with Cortisone. 17-ketosteriod excretion is reduced by Cortisone except when very large doses are given. ACTH produces less change in the concentration of serum lipids and cholesterol than does Cortisone.

Administration of ACTH and Cortisone.—ACTH is available in two forms (1) dry powder and (2) stable solution. The powder is stable; but when once it is made into a solution it should be kept in an ice-chest. Saline or distilled water should be used as the diluent and the solution should not be stored even in the refrigerator for more than 2 or 3 days. There are now "longer-acting" ACTH preparations, which contain a special diluent that retards the absorption of ACTH. This may be used only once or twice a day, instead of every six hours.

Cortisone acetate is available in two forms: (1) a crystalline suspension in saline containing 25 mg. per cc. and (2) tablets of 25 mg. for oral use. For eye drops the crystalline suspension in saline is used; 5 mg. per cc. of saline is generally prescribed with the addition of extra-saline.

As the gastric juice and digestive enzymes inactivate ACTH rapidly, the intramuscular or intravenous routes should be used. The intravenous route is more reliable and more effective than the intramuscular as the muscle enzymes are liable to inactivate ACTH. If the intramuscular route is used the daily dosage is divided and administered six-hourly. The "long-acting" preparation containing 20 to 40 mg. per cc. in a gelatin medium need be given only every 12 or 24 hours.

For intravenous therapy 20 to 30 mg. of ACTH diluted in a litre of saline or 5 per cent dextrose is given slowly by the drip method over a twelve hour period. Anaphylaxis at the start should be watched for. The intravenous administration of ACTH is 5 to 20 times more effective than the intramuscular route, which means that 20 mg. of ACTH by the intravenous route is as effective as 100 mg. by the intramuscular route; it therefore, means economy in the use of an otherwise very costly drug.

Recently a small molecular or polypetide ACTH has been introduced and reported to be twenty five times more potent than the standard ACTH.

Cortisone on the other hand, can be administered orally, intramuscularly and as eye drops to be instilled into the eye; with cortisone the oral route is more effective and quicker in action than the intramuscular, but the action is shorter and so the drug should be administered six hourly; whereas intramuscularly it may be given only once or twice a day. The slow dissolution of the micro-crystals keep up a constant supply of the hormone.

When using either of these drugs, the patient's salt-intake should be restricted to guard against salt and water retention. Oedema should be watched for and daily weight records should be made particularly for the first few weeks of therapy. Blood-pressure should be recorded daily during the first week, as an increase in blood pressure may mean excessive fluid-retention. A supplement of 1 or 2 g. of potassium chloride orally should be given. It should be increased if the dose of ACTH is high. If the patient complains of weakness, his potassium deficiency should be checked by an electrocardiogram which may show depression or elevation of the T-wave and a prolongation of the Q–T interval. Above all, one

should make absolutely certain before using these drugs, that there are no contraindications to this therapy. Radiological examination of the lungs and blood examination for W.R. should be done in every case and one must be sure that the patient has no peptic ulcer.

Overdosage can be recognized by an increase in the total white cell count, reaching to 16000 and above; lymphocytes falling below 10 per cent; reduction of eosinophils to 0-20 per cmm.; total serum protein falling to 4 or 5 gms. per 100 cc.; fasting blood sugar level exceeding 120-150 mg. per 100 cc.; fall of serum chloride and changes in the ECG.

It must be remembered that the greatest drawback of this therapy is that all the conditions indicated for this therapy, relapse more or less quickly on the cessation of treatment, except only when the disease is self limiting. ACTH and Cortisone should at present be regarded at best a life-saving measure in the acute phases of many of the conditions. Whenever cortisone is given, ACTH should also be given to avoid the atrophy of the patient's own adrenal cortex which results from pituitary depression by cortisone. This dose of ACTH should be increased just before withdrawal of Cortisone, and thereafter reduced only slowly. ACTH should never be stopped abruptly. As ACTH and Cortisone produce subjective improvement and suppression of symptoms, their effects on administration should be very carefully watched during acute medical or surgical emergencies for they may mask the true pathological picture and engender a sense of false security.

Within the last half a century hormonal therapy has made phenomenal advances, the most outstanding of which, apart from ACTH and Cortisone, is perhaps the discovery of Insulin by Banting and Best in 1922. The immense benefits to mankind that have accrued from its discovery can be appreciated, if we remember how thousands of diabetic patients all over the world are now leading an active, vigorous and useful life which would otherwise have been a life of despair and uncertainty. Death from diabetic coma has become a rarity after insulin treatment. But the isolation and preparation of such a drug for therapeutic purposes has not been an easy achievement. Various slow-acting insulins have since been evolved; the boon to mankind has thus been incalculable. The therapeutic applications of this hormone are too well-known to the medical practitioners, to be detailed here.

The field of research in the isolation and therapeutic uses of other hormones, particularly the gonadotrophic ones, from different endocrine organs are ever widening; and the progress in this field of therapy has been indeed phenomenal.

The Vitamins.—Deficiency diseases are probably as old as mankind. The term "pellagra," derived from the Italian *pelle agra*, which means rough skin, was introduced in medicine by Italian

physician Francisco Frapolli in 1771. It was also observed by Casal, physician to king Philip II of Spain who described it as '*Mal-de-la-Rosa*' some years before Frapolli.

Beri-beri was recognized in China as early as 2600 B.C. The modern description of its clinical manifestation dates back to the middle of the seventeenth century. It was given to the investigators of the present century to determine the causal relationship of these diseases and the various accessory food factors *i.e.*, vitamins. During the last forty years, many vitamins have been recognized, isolated from natural sources, their chemical constitution determined and the pure substances prepared by synthesis. Simultaneously their therapeutic indications have been fully worked out with the recognition of diseases caused by their deficiency. They are effective in small amounts and do not furnish energy and are not utilized to form part of the animal structure. They are essential for the transformation of energy and for regulation of the metabolism; and as parts of enzyme systems catalyze reactions within the organism. and therefore, within a narrow range of temperature and *p*H.

Generally they appear to be synthesized by plants and are found in animals as a result of food intake or the activity of microorganisms in the intestine. Partial synthesis may be accomplished by animals as in the transformation of the provitamin, *viz.*, carotene into vitamin A or the production of vitamin D by the action of sunlight on the 7-dehydrocholesterol of the skin.

The researches leading to the discovery of these vitamins and their therapeutic indications are now very well known. It is enough to mention that the subdivision of the vitamin B complex is apparently so endless; and we hear so very often of some new discovery of some of its complexes. Folic acid and vitamin B_{12} are the two most recent new additions.

Folic acid, is found in green leaves. But the concentrates of this vitamin are usually obtained from spinach tops, yeast, or from animal sources such as liver extracts. This vitamin is synthesized by the intestinal flora and it is difficult to estimate man's daily requirements. Any deficiency of this vitamin in adults can be cured by giving 5 mg. per day for ten days. It probably forms a coenzyme, concerned at least in the formation of the anti-anæmic principle. It not only stimulates the production of white cells, but also exerts its effect upon erythropoiesis; and is curative in many forms of megalocytic anæmia, steatorrhœa and sprue. It does not prevent and may actually even precipitate subacute combined degeneration of the cord. With the discovery of vitamin B_{12}, the importance of folic acid *i.e.* pteroylglutamic acid has been reduced considerably. But it would still appear to be the drug of choice in the megaloblastic anæmias associated with malnutrition, and

mal-absorption, and with pregnancy and puerperium. The therapeutic dose is 5 to 25 mg. daily.

Citrovorum factor.—It is called so because it is concerned with the growth of the streptococcus *Leuconostoc citrovorum*; and chemically it is related to pteroylglutamic acid *i.e.* folic acid. It appears that folinic acid and the citrovorum factor are identical substances. Citrovorum factor is effective in pernicious anæmia and sprue and is given intramuscularly in a dosage of 3] mg. daily. It is claimed that under its treatment there is hæmatological response as shown by a change in the marrow from megaloblastic to the normoblastic state, a rise in reticulocytes, and an increase in the red-cell count. From microbiological studies and from animal experiments it seems possible that folinic acid (citrovorum factor) is the active form of folic acid (pteroylglutamic acid) in the body.

Vitamin B_{12}.—It was in 1948 that Rickes and his colleague in U.S.A. and Lester Smith in Britain isolated vitamin B_{12} in a crystalline form from the liver; and it was shown that vitamin B_{12} given by injection in extremely small doses was effective in the treatment of pernicious anæmia. At that time it was thought to be of great academic interest, but of little clinical importance because of its great scarcity and expense. They stated at the same time that if vitamin B_{12} could be synthesized or produced cheaply from sources other than the liver nsing newer methods, a great advance in therapeutics would be achieved. What was a pious hope became a reality very soon; and vitamin B_{12} by the discovery of the same group of workers in America, became available by isolation from cultures of *Streptomyces griseus*. Therapeutically active commercial preparations of vitamin B_{12} are now available. It appears that vitamin B_{12} is the active principle in purified liver extracts; and as such it is suggested that vitamin B_{12} should replace refined liver extracts in the initial and in the maintenance treatments of pernicious anæmia. The dosage recommended for treatment is 100 micrograms the first week and 50 micrograms thereafter at weekly intervals until the red-cell count reaches normal. For maintenance treatment 100 micrograms should be given every three or four weeks. Much smaller doses given parenterally have been found to be also effective. It has also a favourable effect on subacute combined degeneration of the cord.

The anticoagulants.—Another important therapeutic advance during the present century is the discovery and clinical use of anticoagulants. Such diseases as coronary thrombosis, cerebral thrombosis, pulmonary embolism and thrombosis, sinus thrombosis, thromboangitis, obliterans and all other vascular thromboses, which together accounted for a large number of casualties, have now a better prospect of cure under the anticoagulant therapy.

It is a well known fact that the leech while feeding on its victim excretes some substances which prevent the coagulation of his

blood and this helps the leech to suck the blood of its victim to the full. This substance known as 'hirudin' is largely used in laboratory experiments, as $\frac{1}{3}$ grain will keep 1000 ml. of blood in a fluid condition for a considerable time. It has been used as an anticoagulant in blood transfusion, the dose being 20 to 300 mg. in 50 cc. of normal saline. But this is not suitable for clinical application.

A better anticoagulant which can be used therapeutically is *heparin* which is a sterile preparation containing the sodium salt of a complex organic acid present in mammalian tissues. It acts as anticoagulant by preventing conversion of prothrombin into thrombin or by neutralizing the action of thrombin itself. One mg. which contains not less than 75 units will prevent coagulation of 500 cc. of cat's blood at 0°C for 24 hours. It is inactive when given by mouth. It acts quickly and the effect disappears quickly too. Heparin can be used in a concentrated aqueous solution containing 50 mg. per cc. and injected intramuscularly in an average dose of 125 mg. twice daily. A coagulation time test is done two and half hours after the injection; and it should show a rise to about double or triple the normal value. If hæmorrhage occurs, the heparin can be inactivated by the intravenous injection of protamine sulphate which is available in 5 cc. ampoules containing 50 mg. The dose of protamine should be that of the last dose of heparin.

The observation that sweet clover caused purpura in cattle led to the discovery and later to the synthesis of a new anticoagulant, which is effective when given by mouth. This is *Dicoumarol* which is marketed in 50 mg. tablets. Dicoumarol increases the prothrombin time—the time that a preparation of thrombokinase takes to coagulate the plasma of the patient. When administered, its dose is controlled by observing the effect upon the amount of prothrombin present in the blood. This is done by an indirect method, as direct chemical measurement of prothrombin is impossible. There are various methods and the conflicting figures are a source of confusion. But perhaps, the prothrombin index which expresses the time as a percentage of the normal time for the thrombokinase used with undiluted blood, is the best method to use.

Of course, the aim of treatment with anticoagulants is to decrease the prothrombin index to the neighbourhood of 50 per cent. If prothrombin time is used, it corresponds to 30 seconds, or a concentration of 23 per cent if the prothrombin concentration method is used. It is claimed that at this level no fresh thrombi will form, nor will any deposition be added to the existing thrombi. If the prothrombin index falls below 40 per cent, hæmorrhages may occur, but they can usually be controlled by giving intravenously 50 to 60 mg. of vitamin K along with transfusion of blood. As regards the dosage, 300 mg. is given on the first day and 200 mg.

subsequently. The prothrombin index is estimated daily, and the dicoumarol is omitted as soon as the index is below 50 per cent, to be continued again as the index rises. The drug is continued until all risk of emboli has passed. In urgent cases, an initial dose of 150 mg. heparin should be given intramuscularly at once; and followed by 75 mg. every six hours for forty-eight hours that elapse before dicoumarol becomes effective. Unfortunately dicoumarol in overdosage may produce toxic symptoms like generalized bleeding into the skin, from the nose, intestine, and kidneys and even in the brain. This may happen even when the prothrombin index is but little decreased. Dicoumarol is contraindicated in renal and hepatic diseases, or in any blood disorder associated with purpura. It is becoming increasingly manifest that owing to several reasons, dicoumarol falls far short of the ideal coagulant. It has a delayed action requiring 32 to 48 hours and doses vary widely in different individuals; and may produce hæmorrhagic complications. Further, the technique for the prothrombin estimation is a difficult one. On account of these disadvantages researches have been directed at discovering an ideal coagulant; and B.O.E.A. (bis-3, 3'-(4-oxycoumarinyl-ethyl acetate) was tried on a number of patients. This new coumarin substance is, weight for weight, about four times less active than dicoumarol and so was given in larger doses. The clinical results were regarded as very satisfactory. Hæmorrhages were not a serious problem. But the results do show that this new coumarin compound has an action similar to dicoumarol which however, develops more rapidly after beginning treatment and passes off more quickly after completion of treatment in the majority of cases. Further reports on this substance may be expected in the near future.

Tromexan (ethyl biscoumacetate) is a synthetic anticoagulant of the coumarin series. It has advantages over dicoumarol, because therapeutic hypo-prothrombinæmia is usually achieved more quickly, within eighteen to twenty-four hours, and the prothrombin time also returns to normal more quickly as compared with dicoumarol's 24 to 48 hours. An initial dose, varying from 1200 to 1500 mg. is usually given, followed by a maintenance dose of from 600 to 900 mg. daily in divided doses. Daily prothrombin time tests should however, be done as with dicoumarol.

The latest anticoagulant that has been found very satisfactory is *Dindevan*. Tablets of 50 and 100 mg. are available. Each tablet contains 50 mg. of phenylindanedione. It is used prophylactically as well as for treatment in cases of thrombosis, embolism, and thrombophlebitis. As a post-operative measure, a lapse of at least twentyfour hours should be allowed before starting anticoagulant treatment. The contraindications are severe hepatic or renal disease, peptic ulcer and hæmorrhagic diseases. The doses recommended are 100 mg. orally twice daily on the first day, followed by doses of

50 mg. twice daily. The daily maintenance doses are determined by prothrombin estimation; treatment is aimed at reducing the blood prothrombin level to 20 to 25 per cent. The prothrombin level can be raised again if required by administering Vitamin K (200 to 350 mg. intravenously or 500 mg. orally). This will block or reverse the action and produce a rapid fall in the prothrombin time within six to eight hours.

Many more therapeutic advances have been made in various other fields *e.g.*, thiouracil and its methyl and propyl derivatives for thyrotoxicosis; hetrazan for filariasis; methionine and choline in pre-cirrhotic hepatic insufficiency and even in the early stage of cirrhosis of the liver; antabuse in alcoholism; B.A.L. (British Antilewisite) in heavy metal poisoning; vegolysin or hexamethonium for rapid reduction of high blood-pressure; intravenous iron therapy; anti-allergic drugs and hosts of other preparations; though not absolutely specific, all of them mark distinct advances over the old time therapy. But they have their drawbacks and limitations also.

In surgical therapeutics, the advances during the last half a century have been equally phenomenal, not only as regards better and advanced technique in operations but also in new fields of exploration. The mortality rates have been reduced considerably by better technique and better understanding of the purpose of the operations performed. Operations on the brain, lungs and on the heart are now being undertaken with increasing confidence and with astoundingly good results. Many congenital heart diseases have been and are being successfully operated upon; and such children, otherwise invalid, have been made to live useful lives. Operations like lobectomy and pneumonectomy are now being performed almost every day, which even Hunter dreaded to think of.

Many diseases have been conquered which used to take a heavy toll of life before. Preventive therapeutics have been conquering epidemics. Man's longevity has increased; but new problems are arising; and geriatrics has become a live problem with all its implications—economic, social and medical.

Radioisotopes.—The latest advance in the field of medical therapy is the advent of Radioisotopes. We have seen the devastating destruction caused by atom bombs; and our hearts shrink with horror at the very thought. But atomic energy has not been without its beneficial effects to mankind. The controlled release of atomic energy has provided a great variety of radiations and sources of radiations. Ever since Curie discovered radio-emanation from radium and its effective therapeutic value, searches have been made for other sources of radiation. As a result, there are now available a great variety of methods using radiation for therapeutic purposes.

Radioisotopes are by-products of atomic energy and have given science a new mode of perception and their applications to medical and biological sciences are just being revealed.

Atoms having the same atomic number but different atomic weights are called *isotopes*. It is now an established fact that almost all the naturally occurring elements are mixtures of isotopes. Thus naturally occurring carbon has an atomic weight of 12 as it contains 6 protons and 6 neutrons. But there are other carbons whose atomic weights are different such as one whose atomic weight is 13 (6 protons and 7 neutrons); and this is expressed as C^{13} which is an isotope of carbon. Some elements have more than one isotope *e.g.*, sulphur.

Heavy elements like radium, thorium and uranium have high atomic weights *i.e.*, there are a large number of protons and neutrons crowded together in the small space of a nucleus of these elements. This cannot be stable as the binding force amongst the nuclear particles cannot be strong enough to keep them together and prevent their disintegration. They are hence unstable and spontaneously eject out particles *i.e.*, protons and neutrons from the nucleus and thus ultimately become stable elements with lower atomic weights. The phenomenon of nuclear disintegration is what is known as radioactivity or radio-emanation. Elements which have got a high atomic number, higher than that of bismuth which has 83, are naturally radioactive. These radioactive substances emit several radiations, the important ones of which are (*a*) *alpha rays* which are the positively charged high-speed helium nuclei; (*b*) *beta rays* which are high-speed negative or positive electrons; and (*c*) *gamma rays* which are electromagnetic radiations. They are of nuclear origin, and are generally associated with one or more of the above radiations. As these radiations emanate, the elements become simpler and stable; and this process is known as *decay*. A particular rate of decay is the characteristic feature of every radioactive element; and this rate is usually expressed by stating its half-life which is the time during which half of the total number of atoms in any radio-active element disintegrates; and this half-life period is constant for each radio-active element.

On the therapeutic side the main development in the use of these radioactive isotopes has been in the treatment of diseases of the thyroid gland with I^{131} an isotope of iodine particularly for carcinoma of the thyroid and for hyperthyroidism.

Hypothyroidism has also been treated with I^{131} by Chapman, Skanse and Evans, who reported that 52 out of 65 patients so treated responded to the treatment. They used a single dose of 10 millicuries, a millicurie being one-thousandth of a curie which again is the amount of emanation from one gramme of radium.

Muller and Rossier reported the use of radioactive colloidol gold particles (An^{198}) in the treatment of inoperable carcinoma of the lung. The technique was complex and the results point to the need for further studies.

Radioactive cobalt (Co^{60}) has been used as a substitute for radium either for local use as in needles or tubes, or replacing the radium in a beam unit.

Radioactive phosphorus P^{32} has been used in polycythemia vera with encouraging results. It has also been used in the management of leukæmia and malignant lymphomas. The introduction of radioactive isotopes and the new chemotherapeutic agents has improved the comfort and usefulness of these patients and their life-span has been somewhat prolonged.

The external application of radioactive isotopes is now receiving greater attention and various complicated techniques are being elaborated. In the external use of isotopes we have the surface application of *beta*-rays from them.

Lang reported using radioactive gallium in human patients. He considers that gallium will localize in primary or secondary bone tumours and may be suitable for palliative treatment for these conditions.

Charles Dunham, Chief of the Medical Branch of the United States' Atomic Energy Commission stated "The control and release of atomic energy has provided a great variety of radiations and sources of radiations. Consequently, there are now available a greater variety of methods for using radiation to destroy cancer cells. These new tools have been and will continue to be exploited in the treatment of cancer. But while enthusiastic about the future of atomic energy in the medical and biological fields, caution is needed against extravagant expectations." Its application appears to be more useful in biological investigations than in therapeutic application. But the potentiality and the future of isotopes remain to be explored at greater length.

Progress in modern therapy has thus made a tremendous advance within the last half a century. Many diseases which had no remedial measures before, are successfully treated now. But however much we may try to conquer Nature and fight diseases, Nature often asserts herself; and new diseases appear in place of the old ones. This was a subject of discussion by eminent medical men who assembled in August last at the first World Conference on Medical Education held in England. As old diseases are conquered new ones appear in their places. The most modern therapy of today may not have any value in the distant future, as the natural history and pattern of diseases continue to change. The struggle between man and disease will continue so long as mankind inhabits the earth; and that is an inexorable law of creation.

It is not the aim of therapeutics to conquer death; but only to relieve suffering and prevent premature deaths. The ultimate

destiny of mankind will ever remain unconquered. This is beautifully expressed in the following lines of the poet Wateson of the Elizabethan era,

"Let no man boast of beautie, strength, or youth:
For like to flowers we bud, we spread, we fade:
Nothing is certaine, but the certaine truth,
To day a man, to morrow but a shade
His last apparell, cut out with a spade,
Of Natures coursest stuffe, I meane her molde,
Must shrowd the corpse, that living shone in golde."

Conclusion.—I have pleasure in acknowledging my indebtedness in the preparation of this paper, to the various publications relating to these subjects in several English and American medical journals which appeared during the last three years, the Medical Annuals and the Year Book of Medicine from 1949–53, the various monographs, Pharmacy International and modern Text Books and many 'Recent Advances' series as well as to books on the History of Medicine, and the Medical News Bulletins published by the USIS. I have also borrowed from my own and others' articles published in the Indian Medical Forum and other journals as well as my notes of lectures in a symposium on Chemotherapy and Antibiotics. No originality is claimed except in regard to statements made "*as our experience.*"

RECENT ADVANCES IN MEDICINE

Some new drugs have been introduced for the treatment of hypertension but their relative place is not yet fully determined. Doubt has been thrown on the existence of essential hypertension as a specific entity. The genetic factors concerned in producing a relatively high blood-pressure at any age appear to be multiple and environmental factors are atleast equally important. The value of anticoagulants in myocardial infarction has become the subject of controversy and doubt has been thrown on the validity of the original statistical evidence upon which their general introduction was based. Most physicians still use them in 'poor risk' cases and phenylindanedione ('dindevan') is tending to replace other compounds. An intravenous infusion of noradrenaline may have a beneficial effect on patients who have suffered a myocardial infarction and who show a considerable fall in blood pressure with symptoms of severe shock. There is increasing evidence that a high dietary intake of fat is linked with atherosclerosis and some evidence that liapæmia is a factor in the causation of intravascular thrombosis. Several studies suggest that there is an anomaly of fat metabolism in disseminated sclerosis although it is clear that genetic factors also play a part in this mystifying disorder. It is much more difficult to control the tremor than the rigidity of Parkinsonism, and the newer drugs do not always give better results than hyoscine and stramonium. A new drug, primidone ('mysoline') appears to have a place in the treatment of epilepsy.—(Extracted from *Practitioner*, October 1954).

The depth of tissue destruction in a fresh burn can be gauged by the use of a modified Van Gieson stain (0·2% acid fuchsin in a half saturated picric acid solution in water). Living tissue stains bright red, dead stains yellow.

THE RENAISSANCE OF AYURVEDA*

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At the end of the last century India awoke from her long slumber to a realisation of the value of her heritage in art, literature and philosophy. The study of Samskrit by western savants, by the Royal Asiatic Society and other learned bodies was largely responsible for this renaissance. As a result of the impact between her age-old culture and the new forces of western thought, India became conscious of her mission and her special contribution to the world in the matter of thoughts, ways of life and spiritual ideals. Medicine being an integral part of the sacred literature of the Vedas, the attention of scientific men, all over the world was drawn forcibly to the unique achievements of India in medical thought with the result that Indian Medicine has since been the subject of study by many orientalists like Zimmer, Julius Jolly, Sigerist and other savants.

The new national awakening which demanded the political emancipation of India gave an impetus to the resuscitation of the age-old system of medicine in a manner suited to the altered modern conditions. The persistent demand of the people for the revival of Ayurveda made even the British Government open special schools and give some measure of encouragement to systems of Indian Medicine.

With the achievement of Independence, the people of India desired more than ever to revive the age-old system of Ayurveda and by methods of modern research to interpret it in terms intelligible to the modern world and where necessary embody new ideas, procedures and drugs into Ayurvedic treatment without altering its basic structure and pattern.

As a result, various States in India instituted courses of study in Ayurveda, combining with it a basic knowledge of modern medicine, such as anatomy, physiology and social hygiene. The Renaissance is still taking shape and will, it is hoped, emerge as a full fledged and suitably integrated system of Universal Medicine wherein Ayurveda will have contributed its quota to the sum total of medical knowledge.

The renaissance of Ayurveda compared with that of modern science.—The period through which India is passing at present may well be compared to the beginning of the Scientific Age in Europe. In 460 B.C., Hippocrates of Cos, the Father of Modern Medicine, collated the available medical knowledge of his time

* Specially contributed to the Golden Jubilee issue of the ANTISEPTIC

and codified it in a scientific setting, just as Charaka did in India. Later in 131 A.D. during the Roman ascendency, Galen of Pergamon wrote another classic just as Susruta did in India. There is a similarity in the styles of both. Detailed description based on experimental work or on personal observation, characterises their writings. Oribasius of Pergamon wrote in 325 A.D. books presenting Hippocrates and Galen in popular form just as Vagbhata did in India with Charaka and Susruta's works. After the seventh century, western civilization suffered a set-back and there was a general decline in art and science. In India, a similar thing was to happen seven centuries later. The renaissance or the so called scientific age which began in Europe between the 14th and 16th centuries gave the Western world its modern scientific spirit.

Medical science was thereby also influenced in many ways:— The revival of the original Greek classics in their pure form and translations thereof into the European languages gave a new life and infused a new spirit into medical learning. More than that was the fillip given to the spirit of inquiry and research. Thus for instance, Francis Bacon, exhorted the physicians of his day to record, collect, arrange and tabulate the data, obtained in the course of their professional work.

We see an universal re-emergence of the classical outlook on disease and treatment, and we appear to be just at the spot where our wise ancients stood, only at a parallel point with them.

The emphasis on constitution and the maintenance of the internal environment or the *milieu interne* of Claude Bernard, is merely Ayurveda or Hippocratism. What was formerly condemned as witch-craft, primitive devil-worship and priest-craft, is now coming into vogue under different, high-sounding and learned names like hypnotism and psychiatry. From absolute reliance on the power of drugs to do everything for us, we have come to believe, as our ancestors did in positive health and environmental, personal and social hygiene as also in the value of righteous thoughts and noble ideals in our daily life.

With the exception of a few diehards who *will* not be convinced, the bulk of the people have awakened to the value of and benefits arising from Ayurveda and our State governments have alro realized it and accepted it in principle.

Ayurvedic schools and colleges, dispensaries and hospitals have been newly opened in every State and old ones substantially strengthened. State governments have allowed the Ayurvedic practitioners to register themselves and thus ensured them the status of practitioners of medicine. Control and standardization of Ayurvedic medicines have been started. Research centres have been opened to develop the correct and scientific understanding of the fundamental concepts of Ayurveda. Philanthropists are coming forward to help in the revival of Ayurveda. Learned vaidyas and

scholars devoting their time to the publication of articles and books on the subject. Thus the people and popular Governments are interesting themselves more and more in the revival of Ayurveda.

The subject is now being discussed at all levels and in all conferences of medical men and State Health Ministers. It is a happy augury that Ayurvedic vaidyas and allopathic doctors now meet and discuss things in a friendly and dispassionate atmosphere.

The most important feature which is receiving considerable attention in contemporary medical literature is the 'concept of the human organism.' Ayurveda calls it the *Purusha* who is the subject matter of the Science of Life and knows him as a vital agglomerate of the body, senses, mind and soul. Man as a psychosomatic organism visualized by some as yet mysterious vivifying force is now regarded as more than a probability. The inter-relations of various organs and the influence of a nuclear and indefinable force constitute the essential aspect of medical training.

This brings us to the question of constitution. We recognise that no two individuals are entirely alike. The full understanding and appreciation of this individual variation with its necessary implications of immunity or allergic factors and therapeusis, have been expounded by modern medical scholars, like Julius Bauer, Cannon and Cawadias to mention but a few. Ancient Greek masters, and the sages of India, like, Charaka and Susruta, built up their systems on this bed-rock of constitution (प्रकृति), which remains quite firm today.

The concept of health is thus in its undivided and integrated form of the body-mind. Ayurveda has a dynamic and creative view of health, for health can never be a mere static condition. It must grew like life or fall. Hence the need for constant vigilance.

There is a regimen of conduct known as (स्वस्थवृत्त) hygiene, social and individual and a good life (सद्वृत्त) which includes the control of the senses and the mind and which ennobles man and lifts him above the dangers of psychic and nervous disorders that are constantly increasing with the stress and strain of the so-called modern civilization. This psychic regimen provides wholesome nutrition to the mind even as the physical regimen does to the physical body.

Charaka's concept of a healthy man is as follows: —"Now the life of such a man is called happy as is not afflicted with either bodily or mental ailments, as is, in particular, endowed with youth, strength, virility, reputation, enterprise and boldness befitting his abilities" (*Charaka Sutra*, 30–24).

There is a universal demand for the inclusion of the study of medicine in outline in the curriculum of general studies. This will avert the development of morbid conditions on as large a scale as now, by enabling every man to understand the demands

of health in its earliest stages of deterioration. This will give every man not only a health consciousness in daily life and knowledge of seasonal regimen, but will enable him to rectify the initial disturbances of health by appropriate and simple domestic remedies. This was the practice obtaining in the heyday of Indian medicine.

Defining the physician's duties Charaka says :—" For his part, the physician, too, should regard all his patients as his own children and vigilantly guard them from all harm, considering this to be his highest religion. With the object of righteousness, wealth and sense-satisfaction, the great sages devoted to righteousness and to seeking the indestructible state, promulgated the Science of Life. He who practises medicine neither for gain nor for gratification of the senses, but moved by compassion for creatures, surpasses all. Those who, for the sake of a living, make merchandise of medicine, bargain for a dust-heap, letting go a heap of gold."

"There is no benefactor, either moral or material, comparable to that physician who reclaims back to life, by severing the noose of death, those who are hustled by fierce diseases towards death. For there is no gift greater than the gift of life. He who practises medicine, holding compassion for creatures as the highest religion, is a man who has fulfilled his mission, and attains supreme happiness."

The high and noble purpose outlined above must actuate every practitioner of medicine and we are not without hopes that this welcome change in outlook, will soon permeate the atmosphere in our country, with the renaissance of Ayurveda that is fast taking place.

Future path.—We have had seven years of independence. Much was expected, but even a small portion of it has not been accomplished owing to several obstacles in the way of progress, *e.g.*, dearth of food, earthquakes, famines etc.

In the field of medicine, a true and proper perspective is needed in the minds of the scholars and practitioners of the science, in order to achieve abiding results of value. This should start with medical education, and an accurate knowledge of the history of Indian and contemporary medicine and their gradual evolution through various eras: Only then will students of medicine learn to appreciate the relative values and the complementary nature of medical science and medical practice. Over-emphasis on either will halt all progress and even give place to bigotry and dogmatism in medicine.

Man, disease and drug must be understood in their whole as well as in their minutest parts and the findings regrouped so as to yield the advantages of both processes. Ayurveda stands for the understanding of the whole both with regard to man as well as disease and drug, and the modern system of medicine pursues the

analytic process and has unravelled the mystery of the cell and the minute infecting factors, (the micro-organisms). Thus the two systems are complementary to each other and in a happy blending of the two lies the future greatness of medicine. Like *Prakriti* and *Purusha* of the Sankhya philosophy or of matter and mind, they have meaning and fulfilment only in their union; separately they are imperfect, barren and even misleading. They are destined to unite and it is the duty of everyone interested in the welfare of mankind to bring about this fusion.

An universal system of medicine, based on the recognition of all variables in health and disease, is indispensable and should be the ultimate objective of all human endeavour. Man's future is safe only in an integrated and co-operative group life. Politically as well as culturally, man must unite under one government, one scheme of things and one system of health and healing, of course in such a way that the peculiar needs of the individual find necessary accommodation in the scheme. This is an ideal, calling for the best efforts of experts in all the systems of medicine in vogue, who should all come forward in a spirit of goodwill and co-operation to offer of their best at the altar of the contemplated '*Universal Medicine.*'

It is to be fervently hoped that Ayurveda blended in the manner indicated above will emerge as a world-science whose benefits will be available to and utilised by mankind over the entire globe.

RHEUMATOID ARTHRITIS FROM THE CLINICIAN'S VIEW-POINT

Any discussion of the diagnosis of rheumatoid arthritis is handicapped by the confusion of identity presently existing. Too often, the diagnosis is made when the disease is not present and sometimes the disease is present but undiagnosed.

Rheumatoid arthritis may be considered an evolutionary disease because of its slow, insidious development; it is seldom explosive in onset. In the beginning, there is a notable change in the individual's sense of well-being and he or she becomes conscious of increasing muscular weakness and fatigability. Increasing stiffness is noticed on arising in the morning. This usually disappears within an hour or two after being up and about and "working out" the stiffened joints. Also on rising, the patient may notice puffiness of the hands and weakness of the hand grip, and may find that running his hands under hot water or standing under a hot shower does much to accelerate the loosening up. This "jelling" phenomenon is a striking feature of the disease and must be considered, along with an accelerated sedimentation rate, as almost a *sine qua non* for the diagnosis of active rheumatoid arthritis, either or both of these occurring in atleast 95% of all cases.

In studying a patient developing rheumatoid arthritis, one should look beyond the joints at the whole individual. There one will find with amazing consistency a personality dominated by the psychology of fear, the fear in this case not having to do with the external environment but rather being a fear of the individual's own inadequacy, a fear of failure to perform or to come up to expectations. In a very high percentage of cases, I have found patients with rheumatoid arthritis to have a devastating and ever-present feeling of inadequacy. Because these individuals feel inadequate to whatever life situation they happen to be in, they attempt to compensate by maintaining, a continuous state of alarm.

Suspenseful situations are intolerable to such people, and the greater the degree of suspense, the greater is their feeling of internal tension and impending dissolution. In order to insure their adequacy in meeting a given situation, they will anticipate that situation for days or even weeks in advance imagining in minute detail how such an event may shape up.

Now not every individual with this type of personality make-up develops rheumatoid arthritis, but it is a very striking thing that most individuals who develop rheumatoid arthritis do have such a personality.

Aetiology :—It is appropriate at this point that purely as clinicians, we try to develop some view-point on æ:iology with respect to this disease. Our failure to develop concepts of etiology lies in our grim determination to find a singular unitarian aetiologic factor with respect to rheumatoid arthritis as well as to hypertension, bronchial asthma, ulcerative colitis, and other diseases in this category. The origin and development of these diseases, particularly rheumatoid arthritis, may be likened to the growth of a weed in which 3 basic essentials, *namely*, seed, soil and water, are equally indispensable to its growth—no one or two of these can produce a plant without some help from the third element.

If we can apply this analogy to rheumatoid arthritis, the seed is the factor of heredity. In some individuals, the hereditary tendency toward rheumatoid arthritis is so great that seemingly even poor soil and very little water are enough to bring forth the fully developed disease. In other individuals, the hereditary factor may seem very minimal indeed, but in those you will always find a comparable abundance of the other factors. Suffice it to say that the stronger the hereditary predisposition as evidenced by the greater incidence of the disease in the family history, the less prominent and potent need be the other factors, and *vice versa*.

The "Soil" of rheumatoid arthritis may be thought of as the physiologic conditioning which results from the personality disturbances previously described.

Such a person is in a state of chronic alarm, whith a resulting disturbance of tonus of the skeletal muscles and a resultant sympathetic hypertonia. Evidence for these can be found in the muscle spasm and atrophy which rheumatoid arthritis invariably exhibit, often months before any actual joint involvement occurs.

The third factor of æ:iology mentioned is the water on the soil and seed, and here we should think of the precipitating factors, which comprise infections, physical or psychic shocks, severe exposure to cold, excessive fatigue etc. These provoke the frank manifestations of arthritis in an individual who may have been having for some time the prodromes of weakness, easy fatigue, early morning "jelling," etc. For a working hypothesis, I think we can look upon the æ:iology of rheumatoid arthritis as a combination of these 3 factors of hereditary diathesis, psychosomatic alterations (physiologic conditioning), and exciting or precipitating factors. —(*Am. Pract. and Dig. Treat.*, Aug. 1954, via *Cur. Med. Dig.*, Dec. 1954).

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4. Although seemingly innocuous and nondisturbing to the patient, gunshot wounds of the buttock may be associated with perforation of pelvic organs.—(From *G.P.*, July 1954).

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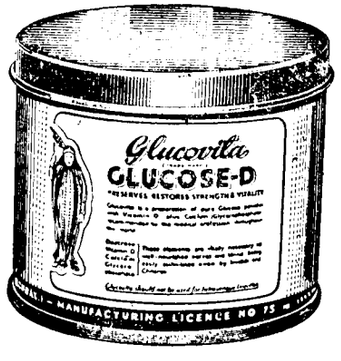

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Cases and Comments

HAEMANGIOMA OF THE LARYNX

D. BHASKARA REDDY, M.D.,
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THE forensic pathologist frequently meets with many cases of sudden deaths the exact cause of which during life is not always known and very often difficult to guess. Even at autopsy, he is likely to miss the lesions if the autopsy is not done in a thorough and searching manner. Hæmangioma of the larynx is one of the conditions known to be missed during autopsy, mainly because the vessels collapse after death and so the antemortem tumour is not present, and cannot be recognised by the naked eye.

Hæmangioma of the larynx is a rare neoplasm and very few cases are recorded in literature. Erich found 25 cases of hæmangiomas in a 30 years' survey. Bernhaudt reported attacks of suffocation in a patient, the result of similar growth and recorded improvement by injecting with sclerosing fluids and collapsing the blood vessels. The growths may be diffuse or sessile. Asphyxia or massive hæmorrhage may account for the sudden deaths in these cases.

FIG. 1. Photomicrograph illustrates multiple sub-epithelial capillary spaces each one of them separated by thin stroma. The surface lining squamous epithelium is intact.

The autopsy findings in a case of hæmangioma of the larynx are recorded below :—

Autopsy report (266/53).—Female aged 15, alleged to have died of drowning was necropsied on 24-9-'53. Significant post-mortem findings were wanting. A section of the larynx revealed chocolate-coloured widened spaces occupying and protruding into the lumen of the larynx.

Fig. 2. Photomicrograph illustrates multiple capillaries of different sizes separated by connective tissue. In places breech in surface epithelium is observed.

Several sections examined under the microscope revealed intact surface epithelium in areas with multiple subepithelial capillary spaces, each one of them separated by thin fibrous stroma (*Fig. 1*, *vide page 221*). In some areas, breech in the surface epithelium was observed, capillaries of varying sizes separated by connective tissue were observed (*Fig. 2*).

Summary.—Necropsy report on a case of hæmangioma of larynx causing sudden death is reported.

Acknowledgement.—I am very grateful to Dr. D. J. Reddy, M.D., for permitting me to publish this case and for helpful suggestions given by him.

RADIOTHERAPY IN THROAT CONDITIONS

In *carcinoma of the larynx*, careful case selection aided by tonography is leading to excellent results in intrinsic cases. Subglottic extension is still an indication for surgery. Hypopharyngeal or *post-cricoid growths* are showing a definite but small percentage of success. This may be due so the high-dosage beam-direction methods advocated by the Swedish School, but supportive treatment with antibiotics, care of the œdema and gastrostomy before treatment, may be of importance. In the *naso-pharynx*, particularly in the rapidly spreading type of tumour, *e.g.*, lympho-epithelioma and sarcoma, a wide field regional application to include lymph drainage areas down to the clavicle is essential. *Upper jaw* cases continue to do well under the now well-practised technique of combined coagulative surgery and irradiation. In the *mouth and pharynx* high-voltage generators have made it easier to plan approach with avoidance of the salivary glands thus preventing the extremely dry and crusty sequelæ of the past.—(*Practitioner*, Oct. 1954).

OMENTAL STONE

(Report of a Case)

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D. B., a Hindu female, aged 54, was admitted to this hospital on 27-5-'53, with pain in the abdomen of one year's duration.

The pain was colicky in nature, and felt in the epigastrium and around the umbilicus. The pain was aggravated after meals, but there was no definite time-relation. Sometimes she vomited during an attack. She always felt as if there was a lump inside her stomach. Bowels were usually constipated.

Past history:—There was nothing suggestive. She had never experienced such pain before.

Personal history:—She was married, but had no children. She was past the menopausal age. She was a vegetarian and led a simple regular life.

On examination:—(*a*) General:—Small built, thin and lean person with a mildly anæmic look. No fever. Pulse 78 p.m., B.P.=105/65.

(*b*) Abdomen:—Scaphoid, and mobile with respiration. There was vague tenderness on deep palpation on both sides of the umbilicus and in the right iliac region. No lump. Liver just palpable. Spleen not palpable.

(*c*) Other systems—N.A.D.

(*d*) Laboratory data:—(i) Blood—T.R.C. = 2·9 million, H.B. = 60%. Total and differential white counts were within normal range. (ii) Urine—no abnormality, except some oxalate and phosphate crystals. (iii) Stools—were positive for E.H. cysts; while she was attending as an out-patient she was given a course of anti amœbic treatment. After admission there was no abnormality in the stools.

(*e*) X-ray examination:—Barium meal examination showed the stomach and duodenum to be normal. The stomach emptied in 4½ hours. No tenderness was elicited in this region. No abnormality was seen in the intestines. After 24 hours a trace of barium was seen in the descending colon.

Treatment:—She was kept on carminatives, belladonna, iron and liver extract etc., but her pain was not relieved. Exploratory laparotomy was, therefore, decided upon.

Operative findings:—On opening the abdomen a stone-like calcareous deposit was found in the fringe of the greater omentum. The pedicle was quite long and so it was possible that a stretch or

a twist in it might have been the cause of the pain. No other abnormality was found anywhere else. The stone was removed along with a portion of the greater omentum, and the abdomen was closed. The stone removed was of the size of a big lemon, with an irregular hard surface. It presented a dirty white appearance inside when cut across, and consisted of calcareous particles firmly bound down by fibro-fatty material.

The patient had an uneventful recovery and was free from pain after the operation.

My thanks are due to Dr. C. M. Sharma, Chief Surgeon, who permitted me to publish this case report.

SOME CASE REPORTS OF INTEREST

Ch. KRISHNAMURTY,
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I. (1) Two cases of urgent dyspnoea.—A Hindu male, aged about 25, was seen on 15th July at 5 p.m. with breathlessness, constant crowing, inability to lie down, progressively increasing since three days. On examination his glottis was swollen to the size of a big marble, was red and covered with sloughs. An injection of Soluseptasine was given and hot fomentations and gargles were constantly ordered, without any relief and the dyspnœa appeared to increase. At 7-30 p.m. a laryngotomy under Novocaine infiltration was done and a laryngotomy tube was tied in. The dyspnœa was immediately relieved and air began to enter with a hissing noise He was put on a course of sulphanilamide and made an uneventful recovery. The laryngotomy tube was removed a week later.

(2) E. A., a Hindu female, aged about 25, was seen on 3rd November at 12-30 p.m. for an incised wound on her larynx repaired outside. The wound measured 2" in length and $\frac{1}{8}$" in breadth and $\frac{1}{2}$" in depth. It was swollen and angry and was of six days' duration. The patient was having gradual dyspnœa from the fourth day after the injury. On arrival, the patient was breathless, unable to lie down and could only answer questions in a whisper. The resonance in the left lung was impaired, breath sounds diminished and a few rales were heard. At 3 p.m. a high tracheotomy under Novacaine infiltration was done and the patient had instantaneous relief. Air entered through the opening with a hissing sound and a tracheotomy tube was tied in. The tube was removed on 11th November when she was able to breathe with the tracheotomy hole closed. She was put on M&B 693 from the beginning, her lungs cleared and she had an uneventful recovery.

II. A case of acute rheumatic fever with chorea.—K.S., a Hindu male, aged about 14 years, was seen on 3rd October for fever and violent tremors in the whole body. He was more or less unconscious, tongue thickly quoted with fur, pulse feeble, temperature 101°F. As the tremors were very severe he was given a hypodermic injection of morphine and hyoscine ; also chloroform inhalations till he came under the influence of morphine. He had some rest and the tremors were much less on the next day. He was put on salicylates and bromide internally as he had acute pain in all the joints of the upper limb and in his right hip. The pains were fleeting and systolic murmurs were heard at the base and apex. He had been branded at home on the joints. As the pains were intense an intravenous injection of Sodium salicylate gr. 10, was given on 6th October and on the 7th his temperature came down to 99·4°F. The tremors again appeared on 8th October and were controlled with chloroform inhalations. Salicylates were continued in large doses by mouth and he became normal on the 12th. He continued to improve and was quite all right on the 16th, free from fever, joint-pains and murmurs. Chorea accompanying acute rheumatic fever is perhaps rare although it follows the fever.

III. A case of acute mania following a septic injury.—G.S., a Hindu male, aged about 30, was stabbed with a spear on his left elbow on the 25th July. The injury was repaired and dressed with sulphanilamide and A.T. serum was given prophylactically. He did not attend for the next five days and came back on 30th July with cellulitis over the left elbow. His temperature was only 99·8°F. but he was reported to be delirious since morning. An intravenous injection of Soluseptasine was given and Mag. sulph. fomentations every four hours after removing the stitches. At 10-30 a.m. the patient became suddenly maniacal, violent, uncontrollable and started beating people near him. With great difficulty he was kept in a separate room, within delirium sheets and held down. An injection of morphine and hyoscine was given atonce and followed by 10 cc. of 10 per cent calcium gluconate intravenously. As he was still violent and uncontrollable chloroform inhalations were also given. Morphine was repeated at night. Soluseptasine and morphine were repeated the next day with full doses of bromide and calcium by mouth. The patient became normal on the 2nd August and the wound healed up by the 5th August.

IV. A case of amoebiasis with sprue.—K.R., a Hindu male, aged about 30 years, was seen in August for diarrhœa, loss of appetite, pain in the abdomen, glossitis and anæmia of one month's duration. The patient was thin and emaciated, and his motion showed on examination R.B.C. cellular exudate and amœbic cysts. Naked-eye appearance of the stool :—mucous intimately mixed with fæces, stool frothy, bulky and acid in reaction. He had about

6 motions a day. The tongue was raw, glossy, red and fissured. He was treated with emetine injections, Kurchi, Yatren, bowel-washes and a mixture of kaolin, bismuth carbonate, calcium lactate and Dover's powder internally. On 7th September, no amœbic cysts were found in stool, and he was put on a course of injections of liver extract and riboflavin by mouth. In spite of six injections, the tongue condition did not improve. Folic acid was then given orally for a week at the rate of 1 tablet per day followed by a course of six injections of liver extract (crude) with folic acid. The patient soon gained in weight and strength, his tongue healed and he was all right. The stool became normal.

V. Amoebic metastasis: a case of hepato-pulmonary and appendicular amoebiasis.—B.G., a Hindu male, aged 40 years, was treated for amœbic hepatitis with emetine injections and was freed of his trouble. He came back with pleurisy of the right side five months later (13th July) with a high temperature 104°F and a feeble pulse. He was put on M & B 693 and Sulphadiazine, intravenous glucose injections and intramuscular emetine with salicylate, diaphoretic mixture by mouth, and Dover's powder at night. The temperature and pains settled down in 10 days. A course of Calciodine injections intravenously was given and he made a recovery in six weeks. For a third time, he came in for a colicky pain in the right iliac fossa with a definite tenderness at the Mc. Burney's point. His temperature was 102°F. He was put on Ochnersherrin treatment and emetine injections on which he made an uneventful recovery. He was next given a course of Kurchi bismuth iodide. Entamœba histolytica and its cysts are never completely eradicated. They just disappear with treatment, only to reappear at another place sooner or later depending on the resistance and mode of life of the carrier.

VI. Psychoneurosis from acalcaemia.—Eight cases of psychoneurosis came under my care during the course of a year, seven amongst females and one in a male, who were all between 15 and 20 years of age. Of the females two were pregnant, three were suckling their infants and two had attained puberty. The usual complaint in every case was they had fits several times a day, the body getting rigid, with fists clenched, mouth shut tight, eyes closed and the lids twitching. The fit used to last for a quarter of an hour or more and the number of fits varied from 4 to 20 in a day. After an initial injection of 5 minims of Adrenalin chloride solution 1 : 1000, to fix the calcium ions, 5 grains of calcium chloride in 5 cc. of distilled water I.V. were given intravenously every day for six days. A bromide-calcium mixture was also given by mouth. The patients became usually free with one course but a second course was repeated when necessary. They were later put on codliver oil, calcium and iron. Other causes of anæmia, like hookworm infection, were also treated, when present.

This kind of neurosis was commonly found in females in primiparæ, lactating mothers and girls nearing or after puberty. Some gave a history of leucorrhœa or dysmenorrhœa and most of them complained of symptoms of a deficiency of thiamin *e.g.* anorexia, nausea, inability to digest food. heaviness after food, paroxysmal tachycardia etc. Vitamin B_1 or yeast with liberal food set them right. A deficiency of calcium and thiamin appears fairly common amongst our middle and upper class ladies, particularly during pregnancy, puberty or lactation. When the condition is severe during pregnancy, we call it 'tetany of pregnancy.'

VII. Two cases of melaena following amoebiasis.—(1) Profuse bleeding and severe anæmia are sometimes seen in amœbic carriers. A Hindu male, aged about 40 years with piles, was operated on about an year ago and was cured. Ten months later he complained of passing blood through the anus several times a day. Local examination showed no pile masses but there was a small fissure which was insufficient to account for the severe bleeding and the anæmia. Treatment of the fissure did not improve matters. An examination of his stool showed E. H. cysts and dead amœbæ. A course of emetine injections followed by Enterovioform and Yatren bowel-washes set him right. The anæmia was later treated with liver and iron.

(2) A Hindu male, aged 24, was treated for amœbiasis with emetine injections, amœbarsan and chinoform bowel-washes. He was cured of the condition. One year later he came back complaining of passing of pure blood per anum 3 or 4 times a day in fairly large quantities. He became pale and anæmic and the Hb. index was 20%. Local examination showed a small fissure posteriorly and examination of the stool showed E.h. cysts and amœbæ. A course of emetine was again given and the melæna stopped. He was later put on enteroquinol to rid him of the cysts along with appropriate treatment for dealing with the anæmic condition.

AMŒBIASIS

Methods of treating amœbic dysentery have changed markedly within recent years. Towards the end of the last war it became apparent that three to four parenteral injections of 1 grain (60 mg) of emetine conferred as much benefit on patients with trophozoites of Entamœba histolytica in the stool as did longer courses of injections. In those passing only cysts, such injections are of little or no value. At the end of the war it was generally agreed that for cyst-passers emetine bismuth iodide administered orally was the most effective drug. Retention enemas were then commonly also used, but increasing experience has shown them to be unnecessary. Few things could be contrived to make a patient more bowel-conscious than a course of retention enemas, and bowel consciousness and associated functional bowel disturbances are major causes of disability following amœbic dysentery. They probably account for many cases which previously were diagnosed as chronic amœbic infections. —(*Practitioner*, 'Advances in Treatment,' October 1954).

RELAPSES FOLLOWING THE TREATMENT OF FEVERS OF ENTERIC GROUP*

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THE treatment of the enteric group of fevers has passed through many changing methods; the alkaline, the antiseptic, the ferri perchlor, and the phage treatments have all had their days and now chloramphenicol is in popular use.

But whatever may be the mode of treatment "Relapses" have been common. "Why this should be so and what could be done to prevent it ?" are questions of interest.

The prevailing idea is that they are due to stopping the treatment too soon; others hold that secondary infections gaining entrance through the healing ulcerated patches in the intestines are probably responsible; yet others think that because of the lowered resistance, organisms hitherto lying dormant become pathogenic. Still another explanation appears *to me* to be plausible.

While treating cases of leprosy, Pot. iodide is given, as a check-up in an apparently cured case, which sometimes lights up what is known as "lepra reaction," with fever etc. Antimony injections are successfully given to control such reactions. Antimony, is by no means a specific for leprosy and so it cannot be said that antimony controls the reactions by virtue of its action on the lepra germs nor is it justifiable to hold that such reactions are caused by some other organisms susceptible to antimony. Can it be then, that these reactions are only tissue-reactions lighted up by Pot. iod. and that the antimony injections in some way or other stop them, though not having any direct action on the bacteria ?

If such a possibility is rational or acceptable the "Relapse cases" may be regarded as a similar reaction caused by some unknown factor or factors and which manifests itself by a course of fever of long or short duration.

We accordingly decided to try the effect of antimony on these "relapses," and the results of our experiments are given below :—

CASE 1 :—Miss B., Hindu female child, aged 8,—a case of typhoid (clinically) with history of coated tongue, tympanitis, leucopænia, lymphocyte increase of a month and a half's duration. For the previous ten days or so, the temperature was touching normal daily and going up to 100–101°F preceded by 3 days of complete remission. The patient was naturally very weak and but for the

* "From a paper read at the South Calcutta Doctors' Club."

temperature, had practically no other complaint,—urine showed no pus cells, and physical examination revealed nothing special. We took it as a case of "Relapse" and she was put on Neostibosan injections. With only, two injections the fever was controlled, but a third one was given as a precautionary measure. It could not be a case of kala-azar, for no case of kala-azar was ever cured with only 3 injections of antimony !

CASE 2 :—Master S., Hindu male, aged 15 years. Clinically a typhoid-group case, with coated tongue, bronchitis, tympanitis, delirium, palpable spleen—leucopænia etc. Temperature touched normal on the 19th day, but then started rising higher and higher in the afternoons, though the morning temperature never went beyond 99° to 99·6°F. It looked a B. coli infection, but B. coli were not found in the urine. Hexamine injections proved of no avail, nor prontosil. Neostibosan injections were started and four injections stopped the fever and the boy came round without further trouble.

Being satisfied with this method of treatment we have been treating all "Relapse" cases (Enteric group) with this drug as a routine measure with good results. It must be stated however, that it is not unusual to come across cases which start with a typhoid-like temperature and even give a weak positive Widal reaction which ultimately turn out to be cases of Kala-azar. To cite an instance :

Mrs. M., Hindu, female, aged 35, was clinically diagnosed as a paratyphoid case, and the blood report showed 1 in 20 positive Widal, against Para A. The fever ran a course of 22 days. After a week of normal temperature, the fever recurred and the case was considered gone of relapse. After it had continued for a couple of months she came, and after she had gone through various treatments for pyrexia of unknown origin, she came under our care.

The spleen was palpable, the blood showed leucopænia, lymphocyte and large mononuclear increase. But before treatment could be started she went away for a change. A sharp rise of temperature for some time, compelled her to return to Calcutta. Kala-azar test was now positive, the spleen was of 4 fingers' breadth below the costal arch. This case unfortunately, ended fatally, Pot. antimony and Sod. antimony tartarate injections given elsewhere notwithstanding. By the way, this case got an attack of colitis, and only B. coli was isolated from the stool. An autovaccine proved ineffective, but a vaccine prepared from the stool of a known case (B. coli) cured her of the condition.

Similar experiences are not uncommon. The prolonged course of fever, the occasional double rise of temperature, the enlarged spleen, the leucopænia, the lymphocyte increase and even a weak Widal reaction are all points of similarity between the two conditions which often cause confusion.

Because, antimony preparations have proved very effective in Kala azar, and because of the similarity recorded above, we decided to try antimony in ordinary cases of enteric, even before possible relapses.

Case reports.—(1) Miss B., Hindu female, aged 16—fever 12 days, remittent type; treatment for malaria, because of occasional feeling of chill though no malarial parasite was found in the blood, was not successful. As the patient was not toxic, she had next been unsuccessfully treated for B. coli infection. Widal test was now found strongly positive 1 in 100, against B. typhosus. She was put on Neostibosan injections, four of which controlled the fever. She passed a couple of small tarry stools at the end of the third week, that is, after the course of injections had been finished; this may have been caused by bits of some coarse raw fruit surrepititiously taken by the patient.

(2) Mrs. G., Hindu female, aged 38.—Clinically an enteric case, but not toxic. She got Neostibosan injections from the 8th day, 4 injections were sufficient for a cure. The history revealed a previous attack of enteric while she was a child.

(3) Mr. U., Hindu male, aged 21.—Clinically a case of paratyphoid, not very toxic. Ureastibamine was administered from the 6th day. Five injections effected a cure.

(4) Mr. D., Hindu male, aged 45.—Clinically a typhoid case, rather toxic, with delirium. Difficulty was experienced in this case; either due to fear of the needle, or owing to his delirium, the patient refused to have any more injections after the second one; he was his own master and so further injections had to be discontinued. After about 5 days the injection was res[illegible]rtec[illegible]ly to be stopped again. Four days later, he was prevailed [illegible]mor[illegible]reac[illegible] renew the course. Five more injections of Ureastibamine [illegible]ias [illegible]ny required to set him right.

(5) Miss L., Hindu female child, aged 11.—This was a[illegible] unusual case, in more sense than one; clinically a typhoid case, later confirmed by the Widal test 1 in 100 positive, against B. typhosus. She required 6 injections of Ureastibamine. After 6 months or so she got fever again. The temperature continued high but she was not toxic. Blood was negative for malaria; there was leucopænia, and lymphocyte increase. She was put on Chloramphenicol and the temperature touched normal on the 5th day of the course, and the convalescence was uneventful. About a month or so later, the fever recurred. Her spleen was enlarged and Kala-azar was diagnosed and she had a course of Stibanate injections. She has been all right ever since.

Comments.—Antimony injections appear to influence the course of enteric fevers favourably both in the acute stage and in relapses, in toxic as well as in non-toxic states. No untoward

complications were met with either during treatment or subsequently. The drug has however, no action on the bacteria, *in vitro* and appeared to act better when the morning and the evening temperatures showed marked variations.

Though the cases of the enteric group submitted to treatment with antimony were not all confirmed by laboratory tests, it should be stated that where laboratory facilities are not available (as in some of our own cases) a physical examination supported by a blood-film examination, may be considered good enough for all practical purposes to start the treatment with antimony preparations. From the pecuniary point of view also, this method is very cheap as compared with the treatment using expensive antibiotics and is therefore, to be considered a real boon to the poorer section of the people who contract enteric fevers.

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PERNICIOUS ANÆMIA

The modern treatment of pernicious anæmia can almost be summed up in the words 'Vitamin B_{12}. The orthodox treatment is to inject a dose of 100 micrograms intramuscularly every week until the red-cell count is normal and the maximum clinical remission has been obtained. Double this dosage should be given if there are neurological complications. Many patients will remain well with the maintenance doses of the order of 50 micrograms every three weeks, or of 100 micrograms a month. In neurological cases the maintenance dose should be 100 micrograms once a week for as long as improvement seems able to occur, *i.e.*, from six months to two years. Better effects are obtained with small doses of Vitamin B_{12} frequently than with large doses at longer intervals. A minor variation in this programme is to give a high initial dosage of Vitamin B_{12} to replenish the body stores. For this purpose five injections of 1000 micrograms may be given in the first week or two of treatment, followed by the normal maintenance dosage subsequently.

A major innovation which is still under trial is the administration of Vitamin B_{12} by mouth. It is now known that vitamin B_{12} corresponds with the *extrinsic* factor of Castle. Its absorption from the alimentary tract requires the *intrinsic* factor of Castle, which is present in normal gastric secretion but absent in pernicious anæmia. Intrinisic factor is thought to be a mucoprotein, and potent and stable concentrates can be prepared. It is thus possible to manufacture tablets containing a mixture of Vitamin B_{12}, in a dosage of the order of 5 or 6 micrograms, and the appropriate amount of intrinsic factor. The usual dose is 4 to 5 tablets daily during relapse and one tablet daily to maintain remission. Recently there have been reports of successful treatment when Vitamin B_{12} is given in a dosage of 50 micrograms to the fasting patient, the last thing at night No food is eaten after 6 p.m. and the dose of Vitamin B_{12} is given at midnight. Although these results are of much theoretical interest, the use of Vitamin B_{12} alone by mouth in pernicious anæmia is expensive, inconvenient and uncertain. The same criticism cannot be levelled at the use of Vitamin B_{12} combined with the intrinsic factor but the method is still under trial and as a routine treatment most hæmatologists in Great Britain *prefer the injection of Vitamin B_{12}*.—(*Practitioner*, Special Number, October 1954).

LANDRY-GUILLAIN-BARRE SYNDROME

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THIS condition is an infective neuronitis characterised by inflammation of the multiple nerves with facial diplegia. Its pathogenesis has not been understood. Attempts made to isolate a micro-organism were unsuccessful. Cases have occurred after the administration of sulphonamides or after an infection of the upper respiratory tract. In 1950 Reitman and Rothschild reported an interesting case of this syndrome developing after an A.T.S. injection.

The pathological response consists of pronounced swelling of the nerve fibres in the spinal roots, spinal cord tracts and cranial and peripheral nerves. The motor fibres of the peripheral nerves show marked degenerative changes in their myelin sheaths with proliferation of the cells of the sheath of Schwann and in some cases swelling and fragmentation of the axis cylinders. There is an inflammatory exudate with round cells and hæmorrhages. Perivascular inflammatory infiltration has also been noticed in the brain.

SYMPTOMS :—There is a short febrile attack. The first symptoms are usually headache, vomiting, slight pyrexia and pain in the back and limbs. The paralytic symptoms develop after a latent period, usually affecting all the four limbs simultaneously or may begin in the lower limbs and spread to the upper. Later, cranial nerve paralysis, especially peripheral nerve paralysis of the face is common. The sensory symptoms characterised by polyneuritis are usually present. The patient complains of numbness, tingling and paræsthesias. Cerebral symptoms are usually absent, but a confusional or Korsakov's psychosis may develop.

Blood shows a moderate polymorphonuclear leucocytosis. The characteristic C.S.F. change is a great excess of protein with normal cell count or moderate excess of mononuclear cells. This is the "dissociated albumino-cytologique."

Recent reports have shown that cases of Landry-Guillane-Barre syndrome have improved with Corticotropin, 25 mg. of which in 500 cc. of 5% glucose in water is administered over an eight hour period. This may be continued for 10 days with very good results.

We saw a typical case of Gullain-Barre syndrome recently with the following features :—(1) Facial diplegia and (2) dissociated albumino-cytologique. The patient however, died of respiratory paralysis, before a full investigation could be made, and suitable treatment given.

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MEDICAL STUDIES

ADDRESSING the Joint Annual Conference of Physicians, Pædiatricians, Cardiologists and Neurologists at Nagpur on the 4th February 1955, Dr. A. SRINIVASAN, M.L.C., Honorary Physician of the Madras General Hospital and President of the Association of Physicians in India stressed the necessity to check any attempt at lowering the standards for medical education and considered that the fall noticed in the present day standards was in a large measure due to the system of selecting students for the medical course. He adduced convincing reasons why the selection of students for undergoing medical courses should not be entrusted to either Government or the University and why it should be vested in the medical profession. "While education is one of the paramount duties of the State," he said "in the atmosphere of contemporary politics particularly in India, the borderline is obscured between the social function of the state and its political exigencies." The principal aim of education and scientific education in particular, is to train and provide the very best talent for serving the country and this ideal is certainly and seriously jeopardised while irrelevant considerations are taken into account as criteria for selection. It is also our considered opinion that when the building-up of the best talents required for serving the country's needs in medicine comes into conflict with pre-conceived notions of geographic, caste or community representations, the selection of proper candidates becomes a very difficult, if not an impossible matter and as Dr. SRINIVASAN pointed out "it is impossible to keep one eye on the ballot-box and the other on absolute values." If the selection of students is vested in a responsible and representative body composed of members of the medical profession such as the All India Medical Council, there will be no room for the play of power-politics. The preamble to the Indian Medical Council Act lays down that the objective in constituting the Medical Council of India is to establish

"an uniform minimum standard of higher qualification in medicine for all the States." This object can be achieved only by picking up the right men for the profession at the earliest stage, *viz.*, the stage of the selection of candidates. An unbiased and efficient method of selecting candidates for admission to Medical Colleges will be to set up boards of selection from among experienced Professors in the medical colleges of the various States and to get the board of medical men from one State to select students for the colleges in another.

With regard to the post-graduate medical education, we pointed out on a previous occasion that the medical profession in India deplores the attitude of the Central Government in its Health Ministry towards the Indian Medical Council by proposing to entrust post-graduate education to a separate board constituted by them for the purpose. This move has provoked considerable dissatisfaction in the profession and the Health Ministry has not chosen to heed the protest of the profession as voiced by the Medical Council and we will not be surprised if they may even initiate legislation in Parliament very soon. As we pointed out already the Union Government could always appoint a Commission of enquiry under Section 20 of the Act, if they had reason to believe that the Indian Medical Council was not discharging its duties properly in the matter of post-graduate education. This they have not done. As Dr. SRINIVASAN very rightly pointed out, "To sidetrack the Medical Council and set about creating a new body seems scarcely worthy of a responsible Health Ministry in a democratic set-up. "To have two bodies, one controlling under-graduate and the other post-graduate medical education would be as unprecedented as it would be illogical." The Health Ministry of the Union Government would appear to rely upon the Bhore Committee's recommendations regarding a separate post-graduate council, which that Committee recommended on the basis that the Indian Medical Council *may not have* the time to deal with post-graduate courses, being fully engaged in carrying out the other recommendations of the Committee. We feel strongly that the medical profession in India as a whole should strengthen the hands of the Indian Medical Council and resist without reservation the proposal of the Union Government regarding the creation of an independent post-graduate medical education board.

Regarding rural medical relief, the dearth of doctors has been placed before anything else as the main difficulty. But as we recently pointed out, it is not the dearth of doctors so much that stands in the way of affording adequate medical relief to the vast rural population of India, as the unwillingness of the numerous private medical practitioners in the urban areas, to go into the rural parts on inadequate pay and allowances and in the absence of necessary facilities and amenities for carrying out their work satisfactorily. Various proposals have been made in this connection, one of which

was to train Health Assistants to work under Medical Officers stationed at Taluk centres. This scheme has not been implemented in many States. The other proposal to increase the number of mobile dispensaries to tour the villages for affording medical relief is being given effect to, at a very slow pace with the result that rural medical relief has not progressed to any appreciable extent. And mobile motor vans are reported to have frequent breakdowns owing to the unsatisfactory state of most village roads.

The Union Health Minister who was opening a new Medical College at Patiala on the 4th February 1955 said that "medical students should have part of their training in a village environment as emphasis has to be laid on India's rural uplift. Such training would not only give our students an idea of the immensity of our problems, but would also be a great help to villagers in the area. Medical educationists and managements of medical colleges should consider how far and in what manner such improvements as were considered desirable should be woven into a web of the teaching programme." She proposed to call a Medical Education Conference so that the technical and scientific aspects of improving medical education in India may receive adequate consideration at the hands of those who are engaged in actual teaching and of others who are interested in promoting the growth of a sound system of training for our doctors. "The present system of paying low salaries to teachers of Medical Colleges and of permitting them to supplement their income through private practice, or even of employing honorary doctors has had the effect of lowering the standards of teaching as well as discouraging the development of research in medical colleges," said she.

We do not think that the honorary physicians and surgeons employed in the State hospitals would thank her for this gratuitous animadversion against their integrity and selfless devotion to duty. Most of them have been very enthusiastic and have also given of their very best in the cause of medical education to students and treatment to patients. So far as the Madras State is concerned, we are in a position to vouch that the honorary personnel appointed in State hospitals have acquitted themselves very creditably and have not lagged behind the paid staff in doing their allotted work.

The establishment of full time units with their members prohibited from private practice and with adequate emoluments granted to them was, in her opinion, an idea which had the backing of sound medical opinion and medical administrators in India. "It had also been put forward recently as a strong recommendation by the Medical Council of India to the Universities and the authorities responsible for the maintenance of medical colleges." So the Medical Council of India and its recommendation in this behalf have received the Union Health Minister's approbation but why should she feel differently when it comes to a question of entrusting post-graduate

medical education to this responsible body, passes our comprehension. Perhaps we may yet hope and believe that the Medical Council of India will ultimately score and become the rightful guardian and custodian of both under-graduate and post-graduate medical education in this country.

EXEMPTION FROM VACCINATION

THE Madras Legislative Assembly passed the Madras City Municipal Amendment Bill introduced by the Health Minister Sri A. B. SHETTY, on the 7th February 1955. The Legislative Council which met on the 8th February ratified the bill as passed by the Assembly. The Bill seeks to amend the Madras City Municipal Act so as to bring it in line with the Madras District Municipalities Act and the Madras District Boards Act so as to permit conscientious objectors and their children to be exempted from vaccination. There was a keen debate on the advisability of the Government taking such a step. Three leading medical men of Madras took part in the debate and one of them was sceptical about the efficacy of vaccination and its compulsory enforcement. Sri Dr. A LAKSHMANASWAMI MUDALIAR was surprised that the Government should bring forward the measure at a time when the people were getting convinced of the value and benefit of compulsory vaccination. He felt that the conscientious objector had no right to prevent his children from getting the benefits of vaccination and that permanent exemption might endanger the health of the society because if there was one attack, the infection would spread. The largest number of blind people was in India and smallpox was one of the chief causes for blindness. The Health Minister assured that Government was a believer in compulsory vaccination and re-vaccination and that they had perfect confidence and faith in the vaccine prepared at Guindy as being pure and efficacious. The necessity for the amending bill appears to have arisen in this wise:- A certain person against whom prosecution was launched by the Madras Corporation petitioned the Governor pointing out that there was an omission in the City Municipal Act of the proviso regarding exemption to be given to conscientious objectors which was found both in the District Municipalities Act and the Local Boards Act. The State Health Minister no doubt pointed out that the exemption under this Amending Act would have to be sanctioned by a Magistrate specially empowered by Government in this behalf and that persons desirous of getting exemption for themselves or their children should undertake to subject themselves and the members of their families to strict isolation of such description and for such periods as might be imposed by the Magistrate. There was considerable discussion in favour of and against the Bill. One of the medical members of the Legislative Council was, as stated above, sceptical about the value of vaccination in preventing smallpox but we are not sure that he

was on firm ground when he said that the incidence of smallpox appeared to be greater where vaccination is strictly enforced and asked the question—was it that the vaccine supplied was not potent? He suggested the appointment of a Committee to examine the vaccine and he was really using strong language when he said 'it is madness to insist on mass vaccination by which they were keeping the public in a Fools' Paradise.'

We wish in this connection to point out and stress the effect of vaccination which according to medical science is the surest way of preventing smallpox, though a few people who did not like to get vaccinated are apt to call in defence of their plea stray cases in which people who had been vaccinated were themselves victims of smallpox later. Smallpox, being a virus disease it is just possible that the immunisation secured by vaccination in a few cases may not be potent enough to resist the attack by a particular type of virus and even then, it has to be admitted that an attack of smallpox in such cases was always very mild and did not end fatally.

Perhaps the most recent development is the preparation of a 'purified virus vaccine freeze-dried and stable which is useful in the tropics and also to serve for epidemic reserves'. The chick-embryo vaccine is antigenically equal to and probably safer than calf lymph accordiug to Cabasso and his collaborators. (*Am. J.P.H.*, 1954, p. 194). In England, Collins devised a technique of large scale manufacture of vaccine of partially purified virus, freeze-dried, in 5% peptone which has proved satisfactory in extensive trials by the three Armed Services. (Report of the Lister Institute, London, p. 6, cited in the *Practitioner*. Special number, Oct. 1954). We mention the above only to show that the world believes that vaccination with stabilised lymph is a safe and certain prophylactic procedure against Smallpox. The vaccine lymph supplied from the King Institute, Guindy is a standardised well-tested and duly authenticated product. We fail to see how a Committee such as the one suggested by the well-meaning medical member can really help in the matter. We believe with the State Health Minister that vaccination should continue to be compulsory, that re-vaccination must be carried out at specified intervals and that the calf-lymph supplied from Guindy to the Madras City and other municipalities and rural areas is of good quality and potent in its action. We sincerely hope that the exemptions claimed under the Amending Act will indeed be very low, particularly if the restrictions sought to be imposed when a case of smallpox breaks out, are rigorously enforced.

"The heights by great men reached and kept
Were not attained by sudden flight,
But they, while their companions slept,
Were *toiling upward* in the night."—*(Anon).*

Special Article

SCIENCE AND MANKIND

(Science and its Application to Peaceful Means of Progress)

F. D. BANA, M.B., M.R.C.S., D.P.H., D.T.M. & H.,
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THIS is an era of rapidly changing ideas with progressive modes of living, production and plannings. Vast strides have been and are being made by comparatively recently developed countries like Russia, China, India and others, based on short and long term plannings of scientific pursuits in agriculture, industry and the prevention and control of diseases. Much still remains to be done to raise the standards of living in backward areas by free or compulsory education, vocational pursuits and industrial undertakings. All these changes should come about gradually, after considering the inherent ways or geographical modes of living, habits and economy of the people. For this, a beginning should be made in enforcing elementary scientific knowledge at the primary stage, *i.e.*, every child should be taught the rudiments of the sciences of Biology, Chemistry and Physics. This scale should be expanded in the school and Universities later on by studies under competent teachers, with adequate emoluments and grants to carry on fundamental research. This was the opinion expressed by Prof. L. Pauling, N.L., of the California Technical Institute in his final lecture during his visit to India. He said the average Indian student was keen and eager to learn, but had not much facility to carry out original work on his own, on account of the paucity of facilities in the Universities and the lack of sufficient means. For this a commission was recently appointed to investigate the ways in which increased grants can be given to research workers throughout the country by the Central and State Governments. This planning should avoid mistakes and pitfalls which occurred originally in more advanced countries like U.S.A., U.K., Russia etc. In this, culture stands out prominently, and should be encouraged at every stage, even by fundamental or pure scientific research. It is not necessary that the immediate application of scientific work should yield unripe fruits or abortive processes in industry, agriculture or medicine. Those who have the aptitude for pure science should be encouraged just as well as those who have inventive skill. Indian research workers have constructed a natural cooking stove for preparing meals by using the solar rays. This was a great achievement but is not far-reaching in as much as it could only be used on warm days. It should also be made useful in wet and cold days during the monsoon or winter months. To achieve this, some method for storing the sun's infinite energy for use on cloudy days must be devised to make it available for cooking. Such an attempt to store

the sun's energy and heat is possible and is now being made available in the U.S.A. and other countries. Another pressing need is to make use of the sun's heat or energy to distil sea water and render it fit for drinking and irrigation purposes in barren tracts like Rajasthan, Arabia and in desert areas where cultivation is not possible and where there is great scarcity of water even for drinking purposes. The Atomic Reactors to be supplied by more advanced countries, as planned by UNESCO at present, will be put to use in the production of power and facilities for growing more food and production of clothing and other necessaries of life in under-developed countries.

It may be said that man's existence on earth, even granting that it is only for a few million years, is nothing as compared to the life of the Earth and the Sun, which can be expressed as a thousandth of a second for man's existence, 24 hours for the earth and 500 years for the Sun. Thus man is comparatively a recent creation and has advanced, say 100 fold, in the last century as compared to the 2000 years of known and recorded progress since the times of the Greeks, Romans and Aryans of India and Persia. The telescope and the miscroscope have helped tremendously in increasing man's knowledge of biology, physics, chemistry and astronomy. By probing into the earth's crust, the geologists have been able to ascertain the ages of development and the periods when man was nomadic and moved firm continent to continent. By comparing the structures of materials found in caves and buried cities, we now trace his progress in successive eras of evolution. Prof. Pauling, by a careful examination of the remnants of rope sandals found in the caves of California has been able to assess the state of the people who inhabited them and to trace their movements from Asia to America across continents, which happened 10,000 years ago.

India is lucky in having for her leader a great Statesman Shri Jawaharlal Nehru who with a broad scientific outlook incessantly strives to bring about a state of Universal Peace in the world. He should be awarded the Nobel prize for peace. Through his farsightedness and the active co-operation of the late Dr. S. S. Bhatnagar, scores of laboratories have been established in various parts of India for the advancement of research in agriculture, industry and medicine.

Kavas Lodge, Perry Cross Road,
Bandra, Bombay-20.

"Physicians are many in title but very few in reality" said Hippocrates the father of Medicine. No doubt this sad truth it was that prompted him to introduce the Oath and to lay down the following indispensable principles for physicians—"Learning, Sagacity, Humanity and Probity'.' It was the humanism of Hippocrates that put medicine on a solid foundation and established the coveted patient-doctor relationship."—(G.P.).

REJOICE WITH US DEAR READER

(Further extracts from Reviews of our Golden Jubilee Issue)

The Indian Medical Gazette, Calcutta, July 1954, says:

"This special Golden Jubilee Number of the ANTISEPTIC is a decorative monument to the praiseworthy record oi 50 years' service rendered by the journal to the public and medical profession alike. We rejoice at the achievement. Our rejoicing would have been immeasurably greater had the founder of the journal Dr. U. RAMA RAU been still with us. He departed 2 years ago having fulfilled a mission.

The special number has other special features. There are 58 special articles by writers who take special interest in the topics they have dealt with.

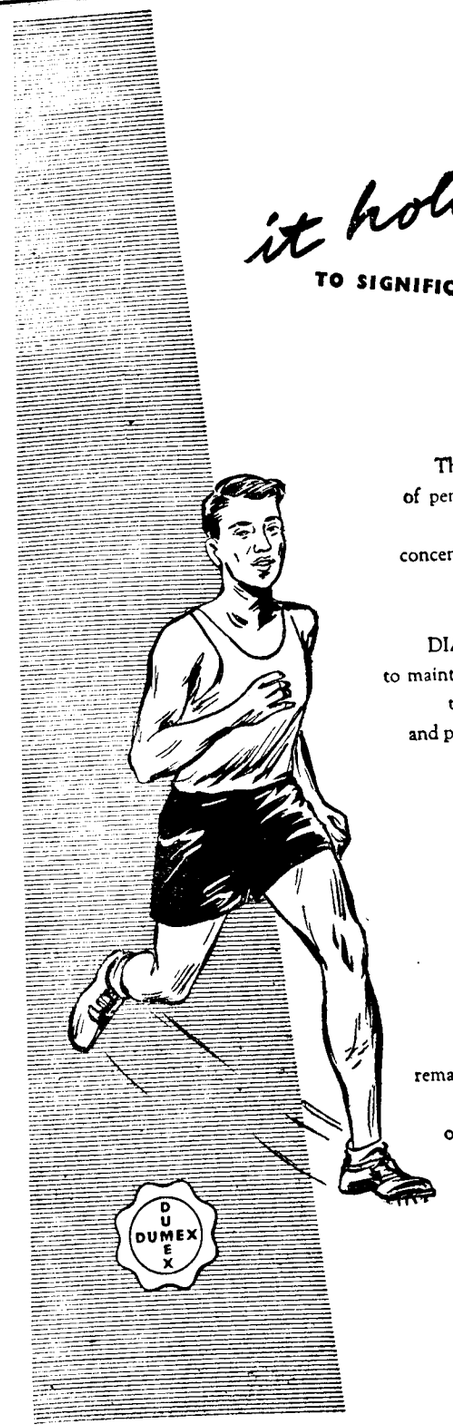
We hope the journal will go on erecting more decorative monuments during its forward march in the fulfilment of its mission. Though the road is now easier it is also broader which makes the horizon wider, the visibility greater and the stars for the wagon more numerous, entailing great efforts in choosing the appropriate one for the hitching."—*Sic itur ad astra.*

The Journal of the Bowman Gray School of Medicine, *12*: 4, Oct. 1954, writes:

"In commemoration of its Golden Jubilee the ANTISEPTIC has published an impressive volume. Advancements in the various fields of medicine during the past fifty years are reviewed in detail. Most interesting is the review of the activities of the journal itself, its trials and tribulations, and the achievements which it has accomplished. Not only does this volume give you some insight into the rapid strides of Indian medicine during this half century. It also sheds some light on the economic and political evolution which is occurring there. This volume presents such a wide range of subjects that there is something within it, of interest for all. The editor and his associates are to be commended on this Golden Jubilee issue.

STRESS—THE CAUSE OF ALL DISEASE

The work of Dr. Hans Selye of Canada indicates that there may be a common cause for all disease—a chemical imbalance within the human body—caused by *Stress*. This imbalance is governed by the pituitary and the adrenals. Their unbelievably potent hormones exert a huge influence on vital body functions. According to Selye's theory, their principal job is to adapt the body to all kinds of stress. "The apparent cause of illness" says Selye, "is often an infection an intoxication, nervous exhaustion or merely old age. But actually a breakdown of the hormonal-adaptation mechanism appears to be the most common ultimate cause of death" Selye believes that if imbalance is discovered by periodic check-ups, the administration of hormones will restore the body to normal.—(J. D. Ratcliffe, in *Reader's Digest*, Feb. 1955).



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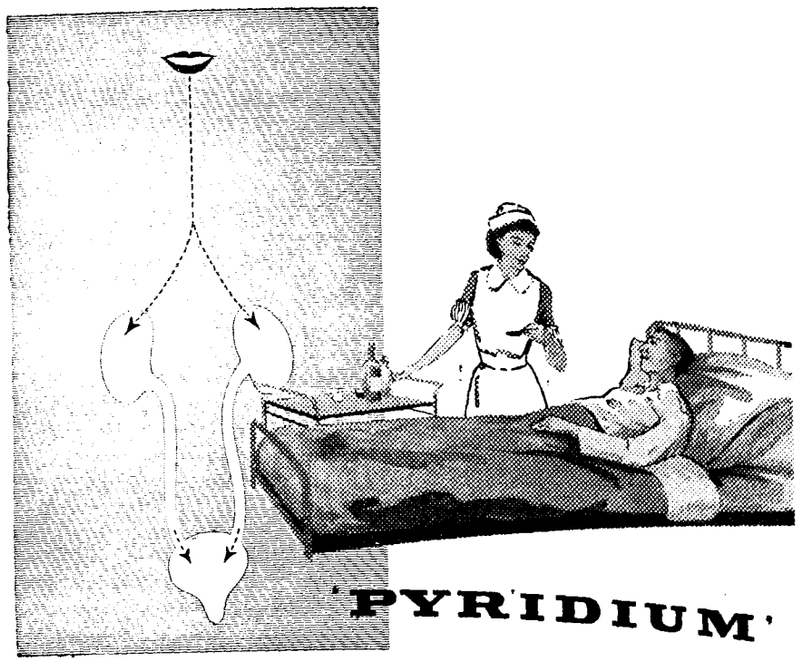

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Gleanings From The Medical Press

DERMATOLOGY

Clinical experience with hydrocortisone ointment.—Early reports on the effectiveness of hydrocortisone (compound F) ointment as a topical application have been somewhat contradictory. During the past 18 months Malkinson and Wells observed the effect of hydrocortisone ointment on various superficial inflammatory dermatoses in 71 patients at the University of Chicago Clinics: 2·5% hydrocortisone acetate in a base of liquid paraffin, petrolatum, cholesterol and multiwax was applied very thinly to the affected areas of the skin three times daily. Wherever possible comparison was made between similar lesions on opposite sides of the body, one side receiving hydrocortisone ointment and the other the ointment base alone.

Clinical impressions are based on the use of hydrocortisone ointment in 71 cases of superficial inflammatory dermatoses, mostly chronic eczematous dermatitis and atopic dermatitis.

In nearly two-thirds of cases hydrocortisone had a positive effect as compared with the ointment base. Of these a quarter responded better to hydrocortisone than to any other topical therapy.

Particularly good results were seen in chronic otitis externa, in eczematous dermatitis of the eyelids and in some cases of pruritus ani.

Chronic cases usually relapsed on cessation of treatment.

Hydrocortisone ointment has no effect upon the dovelopment of erythema from ultraviolet light.

—

A new conception of acne.—(*J.M.S. Med. Soc.*, September 1954).

Acne has been aptly designated as the "plague of youth," for it attacks in the majority of cases, early adolescents of both sexes. The ætiology of this affection is still a mooted one. Formerly, we were prone to attribute acne to five salient underlying factors · (1) the sexuo-menstrual factor, (2) focal infection, (3) gastrointestinal disturbance with a subheading of faulty diet, (4) allergy, and (5) multi-vitamins.

None of these seems to fit, however, in the vast number of cases observed in practice; we meet with many individuals of early adolescent age,or at the onset of puberty, who are perfect specimens of health, wherein the above-mentioned factors could be readily eliminated. Thus the treatment heretofore advocated and resorted to for the removal of the above-mentioned causes, prove unsatisfactory. Neither a strict dietary regime, nor the administration of autogenous or stock vaccines for focal infections as the cause of and the disease *per se*, nor œstrogenic hormones, inclusive of corpus luteum intramuscularly, neither the latest fad of pluro or multi-vitamins administration have been of little value in this cutaneous affection, nor have the mycines been of greater value, or the administration of arsenic in chronic cases.

A new school of thought has developed in recent years, which takes the position that — although taking the above ætiologic factors into consideration they are at best, subsidiary or contributing causes—places great emphasis upon the local origin of acne, says Dr. Aronstam of Detroit.

During the advent of puberty or adolescence, all the secretory, excretory and incretory glands of the body seem to run riot in a most flagrant manner; to be more specific, the sebaceous glands of the face, scalp, shoulder and back predominate in this process of exuberant growth. These glands furnish an oily secretion—sebum, which is a normal function, serving as a lubricant to the body surface. Early adolescence, however, enhances this function and another picture presents itself to us, *viz.*, the clinical manifestation of acne. This condition is aggravated by the early use, misuse and abuse of cosmetics to which girls at an early teenage become accustomed. These cosmetics form plugs in the sebaceous ducts, that lead from the glands to the cutaneous surface, thwart

the natural absorption of ultra violet emanations from the sun to flood the skin. Deprived of this salubrious influence of the actinic rays, micro-organisms readily develop at the site of or underneath the plugs, creating the clinical picture of comedones and the various types of acne, such as acne simplex or folliculitis, acne vulgaris, acne varioliformis, etc. Unna, Sabouraud and Gilchrist and Unna both isolated a bacillus, which they named the bacillus of acne or Unna.

With this concept in mind, our treatment has radically changed; instead of attacking acne from within, we must do so from without and thus resort to various extraneous modi operandi, such as lotions, ointments, mild medicinal soaps, radioactive substance such as uranium, X-ray treatments, ultra-violet exposures and vapo-therapy, etc., not excluding the important factor of extracting the plug or comedone, commonly called the blackhead, by the comedo-spear or extractor, of course, under aspetic precautions, supplemented by the discontinuance of facial cosmetics.

These last mentioned methods have been proven of considerably greater value than any internal medication originally used by dermatologists. Acne ordinarily disappears spontaneously as the individual grows older, in most cases when the person reaches the age of twenty-five, and thus *tempus curat* has demonstrated to be best therapeutic agent; but unfortunately youth is rather selfconscious and sensitive about appearance, particularly girls, and to prevent an inferiority complex in causing injury to their developing minds, the process of time should be assisted by the local therapy suggested above, which can be accomplished very easily.

SUMMARY:—If the early dermatological authorities, particularly Unna, Sabouraud and Gilchrist were alive today, they would undoubtedly accept the rational treatment of acne by the local therapeutic agents mentioned above, such as lotions, ointments, mild medicinal soaps, radio-active substances such as solutions of uranium acetate 2%, X-ray treatment, ultra-violet exposures and vapo-therapy.

MEDICINE AND THERAPEUTICS

Streptomycin treatment of tuberculous meningitis in children: A long term follow-up study.—(J. S. Oldham, B. D. Bower, I. J. Caree and O. H. Wolff, *Tubercle, 35* · 102-108 May 1954, London, England).

The authors report on 122 children with tuberculous meningitis whose average age was 4 years and 3 months and who were given streptomycin or dihydrostreptomycin at the Birmingham Children's Hospital between 1947 and July 1, 1953, Ninety-two of these provided data for the conclusions concerning prognosis. Before 1950, treatment consisted of an interrupted course of streptomycin; the dose employed was 20 to 30 mg. per pound of initial body weight per day, with a maximum dose of 2 g. daily, given in two daily intramuscular injections. Streptomycin was given intrathecally on alternate days in a dose of 50 mg. for children aged less than 3 years and 100 mg. for older children. Each four-week period of treatment was followed by one week's rest; at least three such courses were given. In the last two years, streptomycin or dihydrostreptomycin was given intramuscularly twice daily for a minimum uninterrupted period of 120 days and intrathecally daily for at least 90 days. The dose remained the same. Treatment was continued for longer periods in patients in whom clinical progress was unsatisfactory or in whom the cerebrospinal fluid had not returned to normal. Of the 92 patients, 35 (38%) are still alive and were followed for two to six years. Seventeen of the 35 made a complete and uninterrupted recovery. Nine children had relapses; three of the nine are still under treatment and, although their progress is satisfactory, the ultimate outcome remains doubtful. Fourteen of the 35 survivors have some residual disability; 2 are mentally defective, one has a spastic paraplegia, and one a mild hemiparesis. Twelve children show some degree of hearing loss. This high incidence of residual deafness seemed to be closely associated with the use of dihydrostreptomycin. It is likely that a higher total dosage of streptomycin was given by the intrathecal route than usual. As the authors' results are no better than those reported by others it is doubtful if there is any justification for such intensive intrathecal therapy. The changes in sugar and chloride-content of the C.S.F., obtained at the last lumbar puncture immediately preceding treatment were assessed in 88 children. The lowest recovery rate was observed among those children in whom both sugar and chloride levels were below the median. The degree of change in the C.S.F. before treatment is begun may be of real help in assessing prognosis. The relatively small number of complete recoveries and the occurrence of relapses after several years of good health warrant the conclusion that the results of treatment of tuberculous meningitis with streptomycin intramuscularly and intrathecally reflect the need for more effective therapeutic measures and for a long-term follow-up period before the final results of treatment can be assessed.—(Abst. *J.A.M.A.*, 28.8.'54).

Conservative management of rheumatoid arthritis.—(*Am. Pract. and Dig. Treat.*, Aug. 1954, via *Cur. Med. Dig.*, Dec. 1954).

The first, and perhaps most important, therapeutic approach to this individual is to acquaint him with the nature of his disease. It is important particularly to make the patient aware of the pattern of his personality which is playing such a large role in his disease. The development of insight in this regard will often of itself do a great deal to mitigate the disease, allowing it to yield more readily to medical measures. The patient should be encouraged to cultivate serenity, to be oblivions of results so long as a good effort has been made and, if necessary, to step out of a role or a position which is too demanding and which is aggravating the feeling of inadequacy. The patient must learn to accept the fact that there is a defect in his physiology which does not permit him to handle stress in a manner he would like.

The prescribing of rest for the patient in this or any disease is perhaps a physician's most difficult job. He must be aware of the sometimes far-reaching consequences of such a prescription by its potentially disruptive efforts on the patient's serenity, his earning power, his family routine, etc. Therefore, rest must be dispensed with the same meticulous attention as in prescribing narcotics. Delayed recuperative mechanisms and an increased requirement for rest are outstanding characteristics of the pathologic physiology in rheumatoid arthritis. It is necessary for the patient himself to realize and accept this, and we must insist that he spend 10, 11 or even 12 hours in bed daily. This will often mean 9 hours in bed over night and 1 or 2 hours during the day, depending on the acuteness and severity of the affliction. Working out a rest programme with the patient will be helpful to his *morale* and will clearly demonstrate to both the patient and physician the considerable difficulties involved in maintaining such a rest programme. For a rheumatoid arthritic with active disease, it is seldom that I will compromise for anything less than 10 hours of bed rest out of every 24. Of course, mental relaxation must go hand-in-hand with the physical rest or else the latter would be entirely wasted effort.

The application of physiotherapy to rheumatoid arthritis and its importance should not be minimized. Heat in almost any form is of inestimable value. This is best given in the form of generalized heat to the whole body as hot tub baths 2 or 3 times daily for 5 to 10 minutes each session. Such baths are beneficial not only to the inflamed joints, but also in relaxing muscle tension all over the body and promoting mental relaxation as well.

Massage is beneficial, but it should be restricted to the muscular areas and in no case should massage ever be given over an inflamed joint. Exercises are important and often overlooked. The maintenance of muscle-tone is essential to the ultimate continued good function of the joint. Passive exercises should be undertaken to the

full range of motion of the joint within the limitations of pain. Active exercise and particularly exercise against resistance should be undertaken if at all possible If motion of the joints is completely restricted, then muscle-setting exercises are necessary. It is of greatest importance to have the patient and his family instructed in physiotherapy because almost all such measures can be carried out in the home itself.

Besides the specific therapies, the only medicinals of any direct benefit in rheumatoid arthritis are salicylates and sedation. Most of the cases are best treated with simple aspirin. Sedation is desirable because of the patient's keyed-up mental state and emotional tension. If 15 mg. of phenobarbital, 4 times daily, will assist the patient in achieving emotional calm and mental serenity, then it certainly should be used.

Attention must be given to the individual with respect to any other diseases or disorders of the body This includes the correction of underweight or malnutrition, as well as, in the other direction, correcting obesity if it exists. Treatment of anæmia is necessary, and transfusions may be required. Faulty posture or inequalities of weight-bearing alignment must be searched for and remedied. The elimination of so called 'foci of infection' has no mysterious value in therapy of rheumatoid arthritis except in so far as such foci may properly be considered as aggravating influences of the disease. Of course, providing an adequate well-balanced diet and the necessary amount of vitamins is only good sense for normal living, but these have no peculiar anti-arthritic qualities.

The programme of conservative management outlined above, should be the starting point of treatment of every case. If conservative management is used early enough and intensively by the physician, it is more likely to achieve a true "arrest" of the disease than any other measure of therapy. However, we must admit that until we can probe deeper into the mysteries of the pathophysiologic mechanisms responsible for the disease processes of rheumatoid arthritis, we must be content with holding the arthritis in a *status quo*. with minimal disease activity and disability. When conservative management fails to achieve this, we may feel well justified in turning to more drastic measures such as cortisone or chrysotherapy, always realising that we are holding the disease in check but not curing it. At the same time, we need offer no apology for this therapeutic limitation, for we can look to many other disease entities such as diabetes mellitus, in which medical science has exerted far greater efforts for much longer periods of time and find that the clinician can only offer the patient the same holding or arresting treatment, without offering any cure.

Thrombosis : Non-surgical treatment—(*St. Luke's Hospital Bulletin*, Nov. 1954).

The non-surgical treatment of thrombosis may take one of two forms : the use of anticoagulant drugs or lumbar sympathetic block. Once thrombosis is established, attention must be directed towards preventing emboli to the lungs, preventing extension of the thrombus, removing congestion of the affected parts. and restoring function to as nearly normal as possible.

A standard programme of medical management for thrombosis would in addition to the usual anticoagulants, include the use of certain physical measures. The site of thrombosis is usually in a lower extremity and the physical measures would include :

1. Elevation of the extremity. The involved extremity should be raised to a level about 6 inches above that of the heart. This is best accomplished by raising the foot of the bed 12 to 15 inches.

2. Rest. Once the condition is recognised, any undue activity must be prevented. Ambulation during the acute, active process may result in spread upward into the iliac vein or even to the inferior vena cava—that is, emboli. The old practice of bandaging and walking 20 to 60 blocks daily, is dangerous during the acute process because of the possibility that the clot may be dislodged. However, Meyer and Otto, reported that the treatment of acute and chronic phlebitis with pressure bandages was very successful. Such bandages in association with anticoagulant therapy, were found to prevent pulmonary embolism Fischer, who originated the ambulatory-pressure treatment of phlebitis, also observed that in the treatment of leg ulcers inflamed superficial veins healed very fast under compression bandages. In using pressure bandages, the pressure must be even and the tension considerable ; loosely applied bandages are of no value. Finally mere rest will remove venous congestion and aid in curing a thrombo-phlebitis. In arterial thrombosis, in addition to rest, there must be specific therapy for any co existing disease such as diabetes, syphilis, hypertension or infection.

3. Avoidance of deep breathing, coughing, or straining at defæcation, examinations of the chest, involving deep breathing or coughing to localize or site of an infarct should be avoided. A bedside X ray should be used. Laxatives and enemas should be prescribed as needed.

4. Heat. Moist hot packs applied over the full length of the extremity will relax both venous and arterial vessels. Heat must always be mild.

5. The elimination of tobacco and avoidance of exposure to cold.

In addition to the above physical measures, dehydration which tends to increase the tendency to thrombosis, must be avoided. Three to four quarts of fluids daily are desirable. Some authorities say that the sodium chloride intake should not be increased. But Lewis, in discussing prophylactic measures in the management of thrombosis maintains that the administration of sodium chloride solution has a definite detoxifying action which tends to prevent intra vascular clotting.

SURGERY

Treatment of carcinoma of the breast : The super-radical operation.—(Oscar F. Noel, *Am. Surgeon*. 1953, *19* : 1087).

The author reports on his use of a super-radical mastectomy for carcinoma of the breast and reviews the literature on super-radical operations.

In short, the operation includes : (1) the conventional radical mastectomy and axillary dissection ; (2) a supraclavicular cervical dissection extending as high as the upper border of the thyroid cartilage ; (3) excision of the entire parasternal lymph node chain, including the internal mammary blood vessels from the site of origin of the internal mammary artery from the subclavian artery and the termination of the internal mammary vein into the subclavian vein, to the fifth interspace below ; and (4) a mediastinal dissection with partial or complete thymectomy, together with removal of the lymph node-bearing tissue along the homolateral vein as well if lymph node enlargement is present. On the right side, the lymph-node bearing tissue is removed along the entire length of the superior vena cava ; on the left side the dissection parallels the carotid and subclavian arteries and stops when the left pulmonary artery is uncovered. The skin incision extends from the lateral midneck region, collar fashion, anteriorly and downward across the suprasternal notch and the sternum to the level of the fourth interspace. The sternum is vertically divided to the same level and the sternal knife is directed into the fourth interspace toward the diseased side. The smaller sternal fragment is transected at the level of the first interspace. For adequate mobilization of the clavicle for better dissection of the subclavicular neurovascular bundle, the greater part of the first rib must be resected. Too, the resection of the first rib prevents angulation and compression of the subclavian vein, and therefore removes one of the factors responsible for postoperative œdema of the upper extremity. Care must be exercised to avoid injury to the vagus recurrent laryngeal and phrenic nerves. If the thoracic duct is severed it must be ligated. Parts of the pleura should be removed if they are

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involved in the disease. The mediastinum is drained by two No. 24 F. catheters with continuous suction, or by a dual tube with an air break if the pluera has not been opened. To minimize the postoperative morbidity, firm fixation of the sternum must be obtained

The operation should be done in two stages. First the standard radical operation should be done, followed by the extended operation after 6 to 8 weeks. Unless contraindicated, the remaining breast should be removed by simple mastectomy.

The author concludes that time alone will decide whether this super-radical operation will ultimately increase the survival rate, or whether the mortality rate will be greater than that following the more conventional operations and that the operation represents the most extended surgical procedure yet devised for removal of the potential lymph drainage of the breast. —(*via* Abst. in *Intern. Abst. Surg*, p. 42: July, 1954).

Inguinal hernia in childhood.—(*Mod. Med. Forum*, 1-10-1954).

Inguinal hernias of infancy and childhood should be repaired soon after the diagnosis has been established by the surgeon, if the patient's general health is good. Surgery should be delayed when an infant is premature, there is other important disease, or feeding problems are present. Thus, herniotomy should not be performed during the first six weeks of life, unless strangulation is present or imminent.

Early surgery is recommended because:—

1. Healthy infants and children are good surgical risks.

2. A patent funicular process does not become obliterated spontaneously after full-term birth, although the protrusion of abdominal contents into the process may not be noticed for long periods of time.

3. A truss cannot permanently obliterate the funicular process.

4. The operative technique is simpler than in adults, since it is only necessary to perform high ligation and excision of the sac and to restore normal anatomy.

5. The post-operative care is simpler than in adults and the hospital stay is usually of very short duration.

6. Psychic trauma is slight if operation is performed under the age of 2½ or 3 years.

7. An inguinal hernia will inevitably require surgery; and it is sound to do the operation at a time in the patient's life when the procedure is simpler, the hospital stay shorter, the results better, and the complications of school or work are not factors requiring consideration.

8. Properly executed herniotomy assures lasting care in all cases of inguinal hernias of infancy and childhood and approaches the theoretic limit of safety of any operation.

The changing status of the surgical treatment of tuberculosis.—(Editorial, *Surg. Gynaec. Obst.*, Dec. 1954).

No field of medicine or surgery has undergone more remarkable changes in the past decade than the treatment of pulmonary tuberculosis.

Tried and proved techniques, pneumothorax, and thoracoplasty, once considered of greater value, have been abandoned or discarded as old-fashioned and have been superseded by others of greater apparent worth. Clinical results at one time believed excellent are now, under more rigid criteria, considered inadequate and incomplete in comparison to those which may now be accomplished.

Several agents which singly could not have drastically altered the situation have, in proper combinations, produced revolutionary changes. Specific antimicrobial therapy, improved anæsthetic agents and procedures, banked blood, improved surgical techniques, and a better understanding of the segmental anatomy of the lung have each contributed its share.

The removal of a major destructive tuberculous focus is fundamentally better than its immobilization by any known means if the price paid be the same or less. Reduction in risk and the incidence and severity of complications have now reached the point where many major or even heroic procedures—pneumonectomy, pleuro-pneumonectomy, and decortication—may now be quite routinely accomplished at a reasonable price. There can be little argument concerning the advisability of resection of destroyed areas of lung, obstructed and suppurated areas, bronchiectatic and bleeding segments, and larger caseous areas, or the fact that their elimination improves the patient's chances of recovery.

The present programme of rest and chemotherapy with two drugs to maximum improvement (target point) provides an excellent rule of thumb for consideration of resection for the larger lesions but not for the smaller ones. Failure of a cavity to close or the sputum to convert may provide as good an indication for a change in chemotherapy as for resection, since lack of response may be evidence of emergence of resistance of the offending organism to the drugs in use.

Conservation of pulmonary function in all resections, especially in extensive or bilateral disease, should ever be our goal if the patient is to be rehabilitated to a useful existence. This is another advantage of resection over any collapse procedure.

Enthusiasm for the new procedures and the relatively insignificant rise of removal of the smaller lesions have unquestionably led to many unnecessary resections.

The human body has always possessed potential or established ability to control the smaller tuberculous foci. This may be enhanced and extended to more extensive lesions with the aid of chemotherapy. The increasing evidence of the progressive effects of very prolonged chemotherapy certainly should remove the necessity for many of the smaller resections.

The impact of the present treatment of pulmonary tuberculosis by chemotherapy *plus* resection is becoming evident in sanatoria.

Prevention of thromboembolic disease.—(*Arch. Phys. Med.*, *35*: 1954).

Martella and his coworkers in Veteran Administration Hospital of Rutland Heights (Mass) prevent venous thrombosis and pulmonary embolism by using an electronic vasculator. Normal flow of blood to the heart is maintained by electrically stimulating the calf muscles, preventing venous stasis which is an important factor in the formation of thrombi.

The apparatus is compact, portable, silent, safe, and simple to operate. The technique is readily accepted by patients. The operator can control the number of contractions per minute, length of periods between stimulation, and amount of current passing to the electrodes.

The machine is not vapour-proof and, to avoid explosion, can be used in the operating-room only when spinal anæsthesia is employed. Treatment may be used throughout surgery or started immediately after the patient returns to his room.

Electrode jelly is spread on the foil surface of the electrodes, which are then applied over the motor points of the gastrocnemius muscle with the foil surface in contact with the skin. The electrodes are secured with adhesive tape.

The legs are then wrapped from foot to knee in elastic bandages which efface superficial leg veins. The current can be regulated to produce 15 to 30 contractions per minute. Therapy is continued until the patient can perform the contractions voluntarily, usually after twelve to forty eight hours. None of 350 patients receiving treatment after major surgery had venous thrombosis or pulmonary embolism.—(Abst. in *Mod. Med.*, 15-5-1954).

Drainage of the bladder by a suprapubic catheter.—(*Lancet*, 265: 1953, Abst. in *Mod. Med.*, *22*: 10, 1954).

Dr. Scorer of Middlesex obtained good results in the relief of urinary retention by the use of a suprapubic catheter which obviates many difficulties inherent in the urethral catheter. The patient is comfortable, infective complications are reduced, urethritis is avoided and cystoscopic examination is easier and more accurate.

Subsequent treatment of the obstruction of the bladder neck or of the

urethra may follow at any time. Should the patient be considered permanently unfit for major surgery, the catheter can be retained or a larger one substituted.

The technique is simple and safe. Local anæsthesia is used. The outline of the bladder should be palpated almost to the umbilicus before introduction of the catheter. Morphine facilitates palpation of the distended bladder.

A skin incision is made 1 inch below at which the anterior surface of the bladder curves backward to the superior. Entry higher than 3 inches above the pubes is of no value. A short midline skin incision is necessary and the strong fibrous tissue of the lineas alba is cut through to the same extent. The bladder is entered by a short, sharp stab; a boring movement should not be used.

The catheter is fixed to the anterior abdominal wall with a nylon stitch. The tip of the catheter is advanced well into the bladder to a point just behind the trigone to prevent displacement when the bladder contracts.

REVIEWS OF BOOKS AND PERIODICALS

Physical Signs in Clinical Surgery—By Hamilton Bailey, F.R.C.S., F.A.C.S., F.I.C.S., F.R.S.E. and Allan Clain, M.B., F.R.C.S. Twelfth Edition. 466 pages. 680 illustrations, many in colour. [Price 38 shillings 6 pence. John Wright & Sons Ltd., Bristol].

This excellent book on 'Physical Signs in Clinical Surgery' by the well known surgeon and author has reached its 12th Edition. The practice of medicine is gradually being driven to depend upon laboratory aids in diagnosis. But to the successful practitioner the history and physical methods of examination must continue to be the main armamentarium. This book has long been very popular with all students of medicine and the present edition maintains the excellence of its predecessors. Dr. Allan Clain has been responsible in the present volume for the chapter on the 'Orbit' and has revised the chapters concerning 'Fractures and Blood-vessels.' Dr. Hamilton Bailey has written a chapter on 'Supplementary Physical Signs.'

The book is very well written, beautifully printed with illustrative diagrams in every page, all of which are very graphic and so will be of great help in understanding this very important subject. We have no hesitation in saying that it is one of the best books on clinical surgery and we heartily recommend it to all medical students and practitioners. We congratulate the authors and the publishers on the production of such an excellent book. U.K.R.

Antibiotic Therapy in Medical and Veterinary Practice For Medical Students and Practitioners—By Dr. M. L. Gujral, M.B., M.R.C.P. (Lond.), Professor and Head of the Department of Pharmacology, K.G. Medical College, Lucknow. 1955, 170 pages, illustrated. Price Rs. 12/8/- or 18 sh. (The Scientific Publishing Co., 85 Netaji Subhas Road, Calcutta 1).

This book is an excellent monograph on Antibiotics and has been written for the benefit of the medical student and the practitioner who wants an authentic and up to date account of the subject. This book gives in the first instance a classification of the various antibiotics and then describes in general the manufacture of these antibiotics. Detailed descriptions of Penicillin, its history, production, standards, assay, chemistry, pharmacology, dosage, methods of administration and therapeutic uses are described in the next few chapters. Streptomycin, Aureomycin, Terramycin, Erythromycin and other recent antibiotics are also dealt with exhaustively. In the last two chapters the use of penicillin and streptomycin in veterinary practice is described. Synergism and antagonism in antibiotics are also described in detail.

The book has been well got-up and the photography is very instructive. We congratulate the author on his excellent review and recommend the book to all interested in the subject. U.K.R.

Practice of Psychiatry—By William S. Sadler, M.D., F.A.P.A., Chicago, Consulting Psychiatrist to Columbus Hospital and Pinel Sanitarium; Fellow, American Psychiatric Association; Member of the American Psychopathological Association. 1953, pp. 1183 Publishers: The C.V. Mosby Company, St. Louis, U.S.A.

Psychiatry was a maze that was very little understood in the past. From the unknown, almost mystic, quantum that it was during the days of Nebuchadnezar of Babylon, the curtain has now dropped on its evolutionary stages. General medical practice to-day reveals that a large proportion of human ills is caused by unsolved mental conflicts and clinical expressions of the unconscious, the influencing factors being our present civilisation with its many competitive activities and pursuits of pleasure, and its general stress and strain. Thus psychiatry has inevitably assumed an important place in the healing art on a par with medicine and surgery.

These modern trends in psychiatric thought and experience have been lucidly presented by Dr. Sadler in his well illustrated book which contains a vast amount of useful information. The greatly widened field, has been admirably covered and the classifications therein are as realistic and instructive as they are novel and original. Further lines of work are laid down in order to give impetus to research.

Medical psychology is discussed at all levels of mental reaction from the minor to grosser states. Its practical application is clearly manifest in handling problems of childhood, adolesence, adult life and senility. His stress on pathoses and description of personality disorders are thoughtful. The chapters on defective reactions and testing, crime and delinquency, mental hygiene, and psychosomatic medicine cover connected topics and are therefore, useful additions. His special mention of reeducation and remotivation, rest and relaxation, play and recreation and occupational therapy are important adjuncts to treat and control relapses.

Dr. Sadler considers that religion is a force for restoration of calm and peace. One can go without it and be a sufferer. But this vitalising force can be harnessed for the integration and rebuilding of man. The mental and moral rewards for Christ-like living and the philosophy of the personal life and teachings of Jesus are viewed with a psychiatric's eye over a period of 40 years for their effects on the well-being of man. On the whole the book reflects the author's everyday experience, thoughts and reactions to the varied problems he has met. It is a comprehensive compendium on medical psychology leading to descriptive psychiatry. The book is a welcome addition to psychiatric literature at a time when the world needs it most. It will be instructive and useful to general practitioners as well as to specialists and so a valuable addition to any medical or psychiatric library. J.D.

"The Indian Practitioner"—Special Number, January '55. 231, Hornby Road, Bombay 1. Price Rs. 2/-.

We have before us the special number on 'Gastro Intestinal Diseases' brought out by our well known contemporary, *The Indian Practitioner*. There are many useful and instructive articles. Among others, those on amœbiasis, cardiac masquerades of gastro-intestinal diseases, Rœntgenology, as an aid to the study of intestinal parasitism, prolapse of the rectum, afford good reading. Some of the common problems met with in daily practice, are dealt with in these articles. U.K.R.

BOOKS RECEIVED

Human Physiology—By Bernardo A. Houssay, M.D. II Edn. 1955. 1177 pages. McGraw-Hill International Corporation 30, West 42nd St., New York 18. [Price: $ 12·00.

Kwashiorkar—By H. C. Trowell, J. N. P. Davies and R. F. A. Dean, Published by Mrs. Edward Arnold Ltd., London. (Orient Longmans Ltd., 36A, Mount Road Madras 2). Price 50 shillings nett.

NEWS AND NOTES

Medical Aid for Flood Relief by German Firm

The German Firm of Manufacturers of Antibiotics, Messrs Farbwerke Hoechst, A.G., sent a gift of medicines valued at over Rs. 13,000 including Omnacillin and Omnamycin through their Bombay representative Mr. H. L. Nebeling.

The German Consul General for India, Herr Wilhelm Pochhammar, who made the gift on the 10th December 1954, to Sri S. K. Patil hoped that the little gift which was an expression of the warm sympathy of the German people for India, would help to cement the bonds of friendship between the two countries.

Sri Patil accepting the gift on behalf of the Indian Red Cross Society expressed his deep gratitude to the firm for their spontaneous and prompt response to the needs of the *flood-stricken people in India.*

W.H.O. Develops Exchange of Medical Publications

Medical libraries throughout the world, which previously offered their surplus publications to other medical institutions for free distribution and exchange through UNESCO, will now offer them through the agency of the WHO's Headquarters, in Geneva.

According to information recently received from Geneva, WHO will inform medical libraries in its Member States concerning the availability of medical books and periodicals offered by libraries. It will not itself collect and make shipments of such material, but will act as a central information service for medical libraries wishing to exchange and distribute material.

WHO, will be glad to receive from new medical libraries offers of exchanges, accompanied by lists of the most-needed books and particulars of periodicals.

Surgical Camp for Backward People

Bombay Surgeons To Attend

A surgical camp for the benefit of the poor and backward class people will be opened at Devgadh Baria, in Panchmahals District, on February 4

Shri Shantilal H. Shah, Minister for Labour and Public Health, will inaugurate the camp. To be organised at the instance of the Government of Bombay, this is probably the first of its kind where modern methods of surgery will be brought into play for the benefit of the backward class people at their very doors. Four famous surgeons from Bombay have offered their services for the camp.

An organising committee has been set up under Shri Jaidipsinhji, Maharaja of Devgadh Baria, to organise the camp. While the expenditure on patients will be borne by the Government, the committee will provide free lodging and boarding for their relatives.

PREPARATIONS AND INVENTIONS

The discovery of a new antibiotic which is reported to produce "impressive" improvement in severe pulmonary tuberculosis cases and "good results in stubborn infections of the genito-urinary tract has just been disclosed in Atlanta, Georgia, U.S.A.

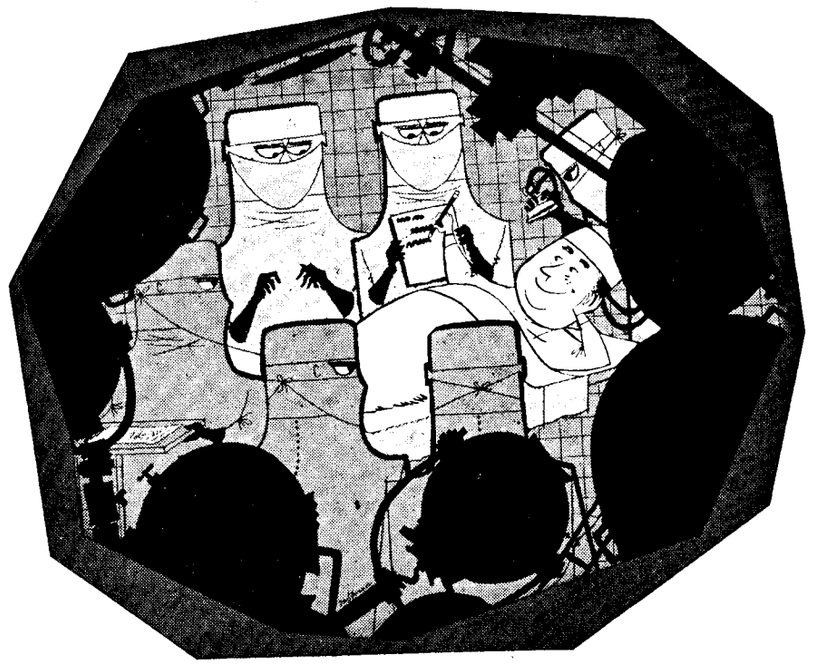
The new antibiotic, known by the trade mark Seromycin (Cycloserine, Lilly) and the generic name Cycloserine, was discovered in the research laboratories of Commercial Solvents Corporation at Terre Haute, Indiana who set up a joint clinical research project with Eli Lilly and Company, Indianapolis pharmaceutical manufacturer.

Seromycin is stated to be "a practical urinary antiseptic in ambulatory cases and especially effective in stubborn infections of the genito-urinary tract."

A joint statement by the two concerns states :—"While Seromycin looks promising in the treatment of tuberculosis and genito urinary infections, it is still too early to define the extent of its medical usefulness."

ACKNOWLEDGEMENT

We acknowledge with thanks the receipt of a beautiful Calendar for 1955 from the Associated Drug Co., Ltd., Yercaud, Salem Dt. which contains a lovely picture in colour of the hill scenery of the Shevaroy Hills.



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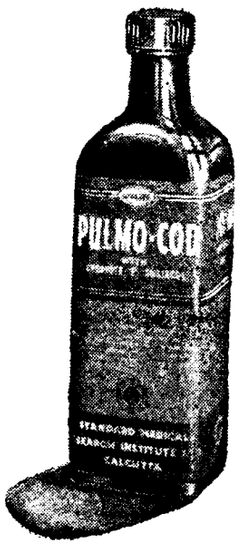

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Chloramphenicol Italy 12 **caps** 7-4
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2 cc. 2-6; 5 cc. 3-4 10 cc. 4-4
Dicrystecin 1-6; Ambistryn 1-5-6
Dihydro Streptomycin 1gm :
Rhodia, DMX, Glaxo, ICI 1-0 **Pfizer's** 1-2
Glaxo's Macrabin 50 micro 5cc 2-11
Glaxo Whooping Cough Vaccine 5cc 1-4
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Hydrargeri Iodine Rubrum 1gx1cc 0-12
Irgapyrin 5x5cc 7-8 20 tab. 5-6
Isonicotinic Acid Hydrazide **Germ.**
100 1-1 500 5-4 1000 10-0
Kemicitine 12 caps 10-0
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20 **mic.** 10cc. 2 **USP** 5 **USP** 10 **USP**
2-10 3-4 4-0
Liver Ext. 10cc. Eng. 2 **USP** 1-13
5 **USP** 2-4; 10 **USP** 2-12; 15 **USP** 3-6
M&B 693 Soluble 1 gm. 6 amp. 2-0
Milk c Iodine 100 **A** x5cc 7-0
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Pfizer's Pronophan 4lac vial 0-15
Penicillin G Crys. Dmx Glaxo or Rhodia
2 5 10 lacs.
0-6-9 0-9-9 0-15-0
Procain Peni. 20 **lacs Gl. or DMX** 1-11-6
,, **Gl. DMX** 0-9-3; **Ity.** 0-8-0 **Belg.** 0-8-0
,, ,, Oily 30 lac. **Heyden** 2-6
Progesterone 5mg 3x1cc box 2-4
,, 10mg 6x1cc 4-4 25mg 6x1cc 5-12
,, 10mg 10cc 5-0 25mg 10cc 7-8
Penicillin Skin **oint** 0-9-6 **Eye** 0-7-6
,, Tab. ½ lac 0-12-0 1 lac 1-12
PAS 100 2-6 500 9-8 1000 18-8
,, c **Cal.** 100 2-8 250 6-2 500 9-10
Roche's Beflavit 1mg 50x2cc 1-4
Schering Testoviron 25mg. 10cc 15-8
Squibb Crysticilin 4 lac 0-10-9
Eu-Quinine :—**Howards** oz 4-8
Java 4-8 **German** 4-4 **Jap. oz** 4-0
Quinine Sulphate :—
Holland Ger. Java. How. Bengal
47-0 49-8 47-4 51-0 42-8 **lb**
Quinine Sulph Howard 5gr 1400 48-8
,, ,, 2gr 1000 18-0 **5gr** ,, 39-0
,, ,, 2gr 100 2-8 **5gr** 100 5-0
Quinine Bihydro 10gr 2cc 100 amp :—
Ind. 13-0 **BW** 33-8 **5gr 100x1cc Ind.** 8-8
Testosterone Propionate Eng.: —
,, 10mg 6x1cc 4-2 25mg 6x1cc 5-8
,, 50mg 3x1cc 5-8; 50mg 6x1cc 10-0
,, 25mg 10cc 7-8 50mg 10cc 13-8
Vitamin B_{12} 100 micro 10cc. 3-4
,, 200 10cc. 5-4 500 **mic 5cc** 8-0
Vitamin B_{12} 1000 Micro 5cc 13-8
Vit. B_1 10cc. 100mg 1-12 **50mg.** 1-6
,, B Complex 10cc. 0-15
Vitamin K, A 1cc 100A box 13-0
,, K 1cc 6 amps ,, 2-4
Vit. C Amp. Ger. 500mg. 5x5cc. 2-0
,, ,, 500mg. 50x5cc. 12-8
,, ,, 100mg 6x2cc 1-5 50x2cc 6-8
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,, ,, 1½gr 500 4-12; 1000 8-8
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Folic Acid Tab. 5mg. 25 2-4 100 7-0
Gynomin tab. 1-11 **Spiton tube** 1-10
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MB 760 25-12, MB 693 500's 28-0
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Mixed Gland Male or Female 100 1-4
Multivitamin 100 1-8 **1000 Orig.** 8-12
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P.D. Camoquin 3 0-6-6 150 tabs 19-8
Potas Chlorus 500 2-2; 1000 3-8
Proflavin 1000 tabs. Aust. 2-0
Riboflavin mg 100 **tab** 2-0 1000 10-8
,, 10mg 100 2-8 1000 tabs 16-8
Santonine **Calomel** 50 2-2 100 3-12
Strichnine Hydro 1/60gr 20 tabs 0-5
Sulphetrone 100 9-8 500 **tabs** 40-8
Sulpha Tab 1000's 500
,, ,, nilamide 6-12 3-14
,, ,, guinidine 11-4 6-2
,, thiazole Boots 21-4 14-4
,, ,, Ind. 500 9-4 1000 17-8
,, diazine 100 7-4 500 31-0
Tinct. Camphor Co. PD 500 tabs 4-0
USA Bandages Brown 2x1½ yd. 0-3
Upjohn's Riboflavin 5mg 100 **tab** 5-0
Vitamin C 50mg 1000 8-4; 100 tab 1-8
,, B Complex 1000 7-0 100 1-4
,, B_1 5 mg 1000 tabs 8-0
,, B_1 10 mg 1000 11-12 100 1-12
,, B_1 25 mg 100 tabs 3-6
,, B_1 100mg 25 3-12 100 **tab** 10-10
,, K 10mg 100 1-6 1000 ,, 7-4
Voice tab 100 1-0 1000 tabs 5-12
Ointment Acid Boric 1 oz 0-4
,, ,, ,, 4 oz 0-10
,, Acriflavine 2 oz 0-4
,, Atropine for Eye ½oz 0-14
,, Atropine ¼ oz 0-6
,, Calomel 1 oz 0-4
,, Mercurial ½ oz 0-4
Acriflavine 5mg 2-0 Aloin oz 2-4
Albumin Tannus oz 2-8
Acid Trichlor Acetic oz 1-12
,, Salicylic 3-2 Aspirin lb 3-10
Atropin Sulph 2-10 **Codeus phos dr** 4-14
Bismuth Carb 1-8 Calomel oz 1-10
,, Subgalla 1-12 Chlorbutol ,, 1-2
,, Salicylas 1-8 Diastase ,, 1-2
,, Subnitras 1-8 **Caffin Citras** ,, 1-2
Bromoform 1-8 ,, pure ,, 2-4
Cinchophen (Atophan) ,, 1-12
Creosote Beechwood ,, 0-8
Dionin 6-14 Santonine dr 4-2
Elixir Amino Consemin 4oz 8-8
Ext. Ergot Liq. 4oz 2-12 1lb 8-8
,, ,, ,, SA Eng. 1 lb. 13-8
Ethylchloride Spray 100 gm 1-11
Eserine Sulph 15gr 5-0 5gr 2-0
Ferri et Quinine Citras oz 1-3
Gentian Violet 1-4 **Protargol** ,, 1-2
Mercurochrome 10gm 0-12 25gm 1-12
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Paraldehyde 0-12 **Pepsin pow.** ,, 1-10
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Japan 0-9 0-13 1-2 1-12 2-10 3-12
Ger. 0-12 1-0 1-8 2-12 4-8 7-8
Record 0-11 1-1 1-4 2-0 7-0 8-0
Swiss Ger. 2-12 3-12 4-8 7-8 9-8 13-8
BD. Lock 2-12 3-10 4-4 7-0 9-0 13-8
Japan ,, 1-8 6-12 10-0 12-0 16-8 23-4 32-0
M.Case 0-15 1-12 2-4 3-0 4-0 5-0
Insulin Syringe 1 cc. **Beacon** 4-8 5-0
Needles Stainless Steel
Star 2-12 Down 3-10 doz Record
Ger. 2-4 ,, 4-0 ,, All Glass
Star 3-0 Jap 1-10 ,, BD 9-8
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Oily Needle Disposal 0-8
Ovum Forcep 10" 5-8
Plastic Tubing 0-14 **Rubber** 0-14 **yd.**
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Pulse Meter ½ Mg. German 1-0
Scalpel 1-0 **Probe** 0-4 **Palol P.D.** 6-0
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Suture Needle Curved 0-4
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Saline Apparatus complete
,, 300cc 5-12 500cc 7-12 each
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Tinct. Iodine 100 tube box 4-0
Tongue Depresser 0-12 **Folding** 1-8
Tooth Forcep Universal 3-8
Tuberculin Syringe 1cc 2-4
Uterine Blunt Currette 4-4
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,, 100 grm German 4-0 DMX 5-4
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Quinine Ger. 52-0; Java 47-8
,, oz. 3-4; Howard 5-0 oz
,, B.G. 42-8 Howards 53-8
,, Tab 2 gr 2-4 5 gr 4-8 100
,, 1000 2gr. 18-8; 5 gr 38-12
,, Howard 5gr. x 1400 48-8
,, Bihyd. 2 gr 3-14 5 gr 6-8
Equinine Roche9-12 Germ. 3-14
[Howards 4-6; Java 4-2
Quin. Bihyd. 100 x 10gr x 2cc
Ger. Ind. BDH B.W. EVANS
20-4 13-0 23-0 33-8 20-12
10-0 15-0 5grx1cc 100 amp
Atebrin 3g 25 10-12; 1g 50 22-4
Aminophyllin 6x10 cc. 2-8
Beflavit 1mg 50 amp 1-2 250 tab 3-10
Vit.B110cc50mg1-8; 100mg 1-11
,, ,, 100mg. 25 3-6; 100 10-6
,, ,, Tab 50mg. 100 5-14
Camphor-in-oil 10A 0-6; 100A 3-12
Campolan 2cc 5 5-10 50 54-0
Calcium Gluconate 10% 100amp
5cc 7-12 10cc 9-0
,, Sandoz 5x10cc 5-0 10x5cc 8-8
,, ,, with Vit C 10x5cc 9-12
5x10cc 5-8; 50x5cc 47-0
,, Vit. C Ger. 200 mg.
[10ccx5 amp. 3-8
Distill Water 100 amp 2cc 2-6
5cc 3-2 10cc 4-6
Emetin Hyd. ½gr 50A 23-12 12A 5-10
BDH 7-4; B.W. 7-4; P.D. 6A 6-0
Emetine 1 gr 12A Eng. 9-10
Emetine 1grx6amp P.D. 8-14 BW 6-12
Glucose Solu. 25% 25cc 25A 4-4
Irgapyrin 5A 7-4; 50A 73-8
Milk with Iodin 5cc 100 7-4
N.A.B. 30 0-11 45 0-13 60 0-15
Liver Ext. TCF 10cc 2-8
Liver Extract 10cc 2 U. 1-14
,, with Vit B & C 10cc TCF3-6
,, 5USP 2-8; 10 USP 2-15
,,Fort. with Vit. B12 20M; 10cc
2U 2-12; 5U 3-3 10U 3-12
Nicotinamide 100x1cc B.W. 5-0
Normal Saline 100A 5cc 3-4
Santonine M&B 4-2, oz. 30-0
Redoxon 2cc 5 2-6; 50 19-4
,, 5x5cc 4-0; 25x5cc 18-4
Vit B12 5cc 100M Glaxo 3-12
,, ,, Eng. 10 cc. 2-14 200M 4-8
,, ,, 5cc 500M 8-0 1000M 13-12
,, ,, B Comp. 0-15 TCF 3-2
Aminophyllin 100 1-4; 500 4-8
Aspirin 100 0-14; 1000 3-10
Atebrin Bayer 1000 13-0; 300 4-0
Calci Lactas 1000 3-12
,, Gluconate 1000 5-10
Gynomin 1-12; Speton 1-12
Camoquin 1000 118-0; 3 Pkt. 0-6-3
Ephedrine Hyd. ½g 100 0-14 1000 4-8
Easton ½dr 100 1-6 1 dr 100 1-14
Cibazol 20 1-10; 250 13-0
Soda Mint 1000 1-8 Eng. 2-10
Mepacrine 1000 10-14; ICI 10-14
Folic Acid 5 mg 100 6-12
Multivitamin coated 1000 8-10
Paludrin 1000 1 g 21-12 3 g 48-0
Vit. C 100 mg 2cc 6 1-8; 50 7-0
,, ,, 500 mg 5cc 6 2-8; 50 13-0
Pamaquin Tab. 500 0-11
Phenobarbiton Tab. 1½ gr.
100 1-8; 1000 10-0
Pot. Chloras 1000 3-2 500 2-6
Proflavin 1000 1-8
Resochin 10 1-5; 100 9-8
Saridon 10 1-1; 250 24-8
Sulphanilamide 500 3-12 1000 6-12
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,, Guinadine 1000 11-0 500 6-0
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Sulphamezathine amp. 25 3-10
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M & B 693 25 1-10; 500 28-0
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Sulphatriad 100 7-12; 500 36-0
Sulphetrone 100 9-10; 500 40-4
Santonine & Calomel 100 3-12
Tinct. Camphor Co. PD 500 4-4
Soda Salicylas tab 1000 5-0
Soda Bicarb 500 1-4
Yeastvite small 1-0; large 2-0
Yeast Tab. 7½ gr 1000 5-2
Oint Calomel 1 oz 0-5
Atropia oint½ oz 0-7
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Combiotic ½ gr. 2-14 1 gr. 3 8
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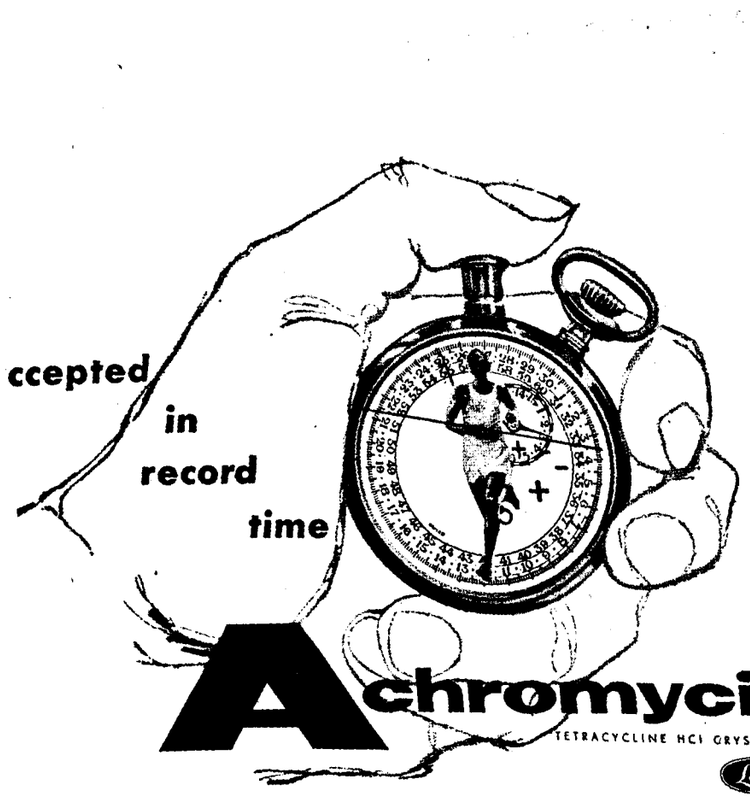

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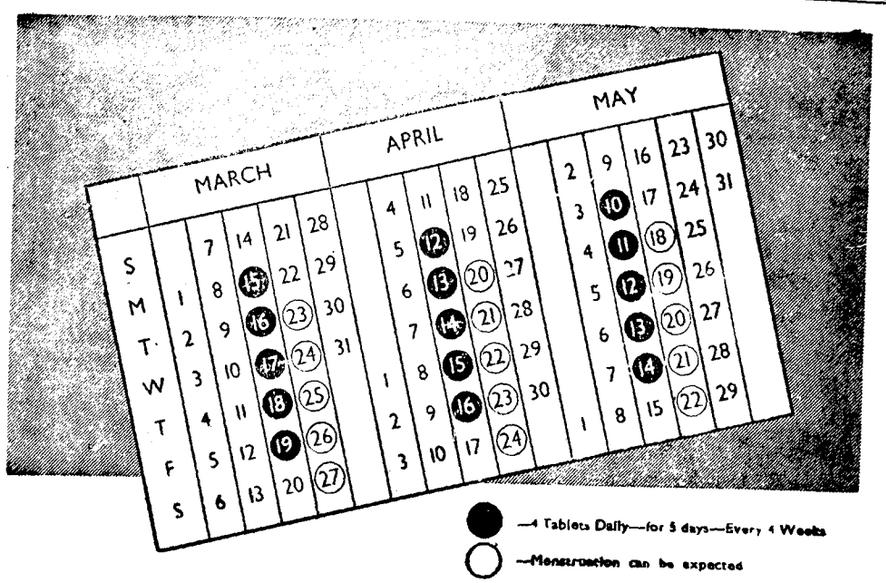

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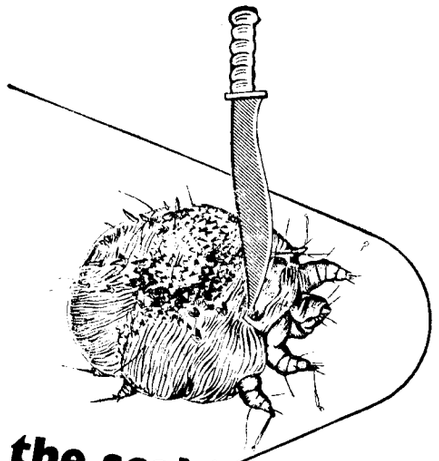

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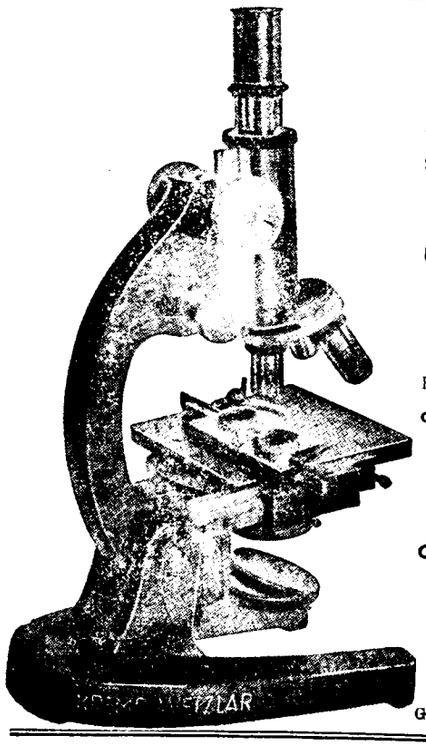

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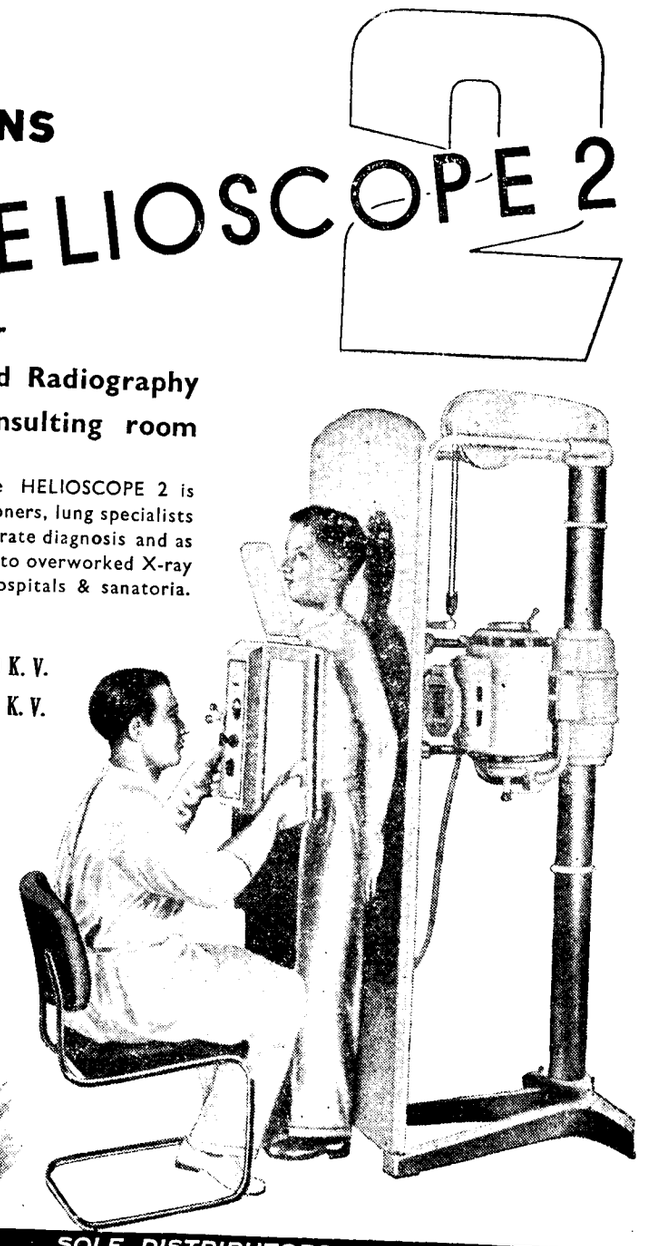

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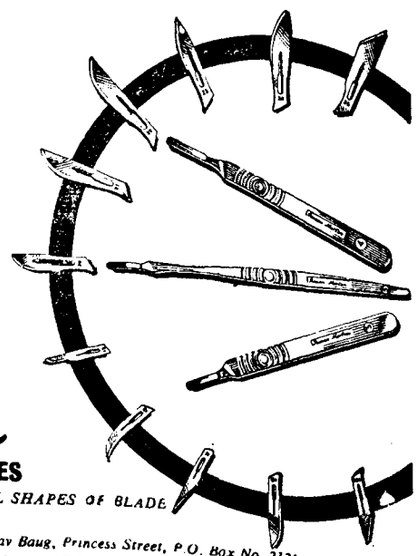

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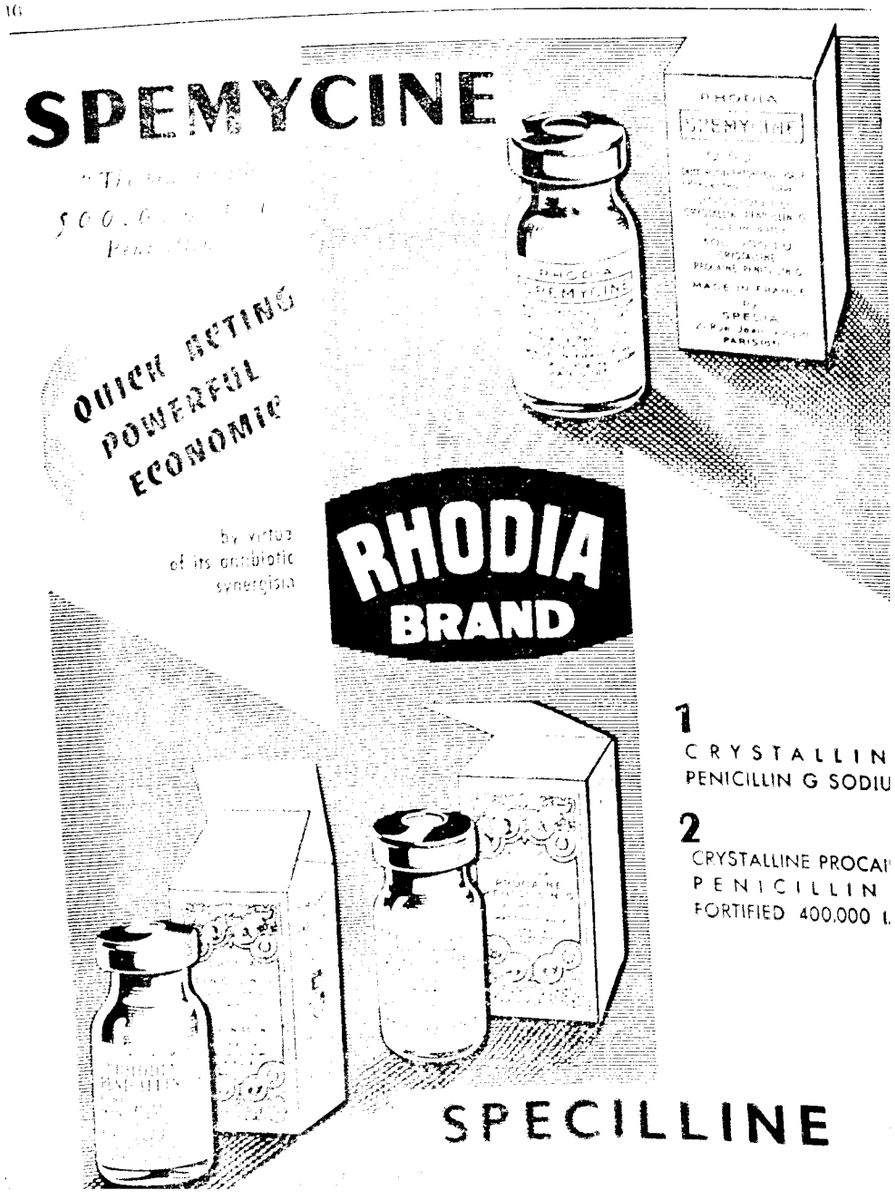

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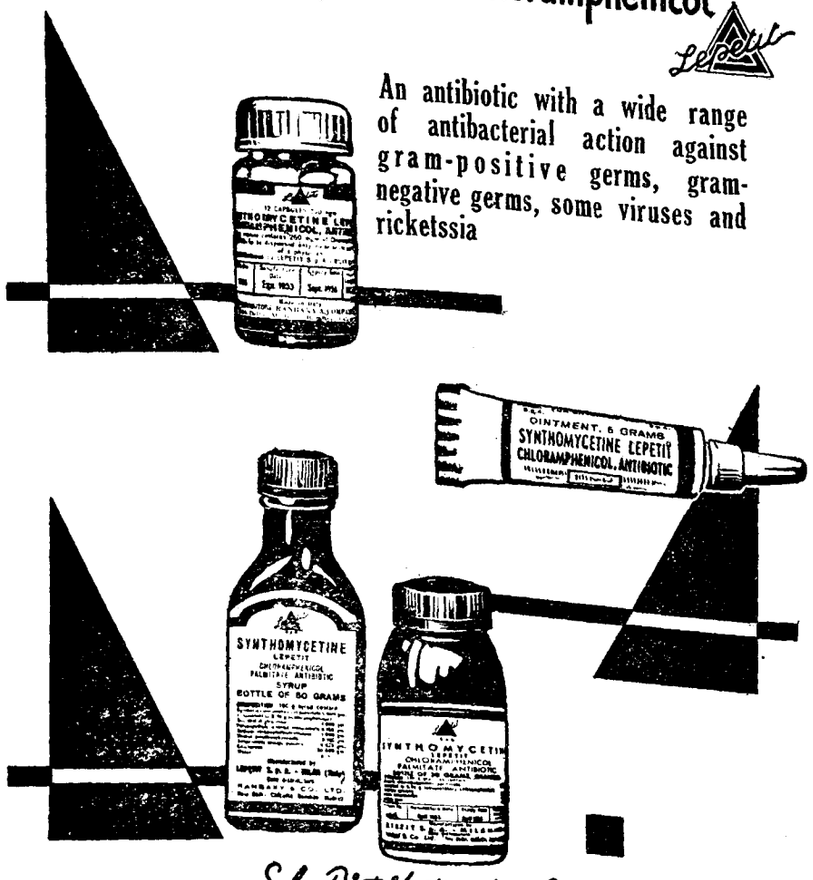

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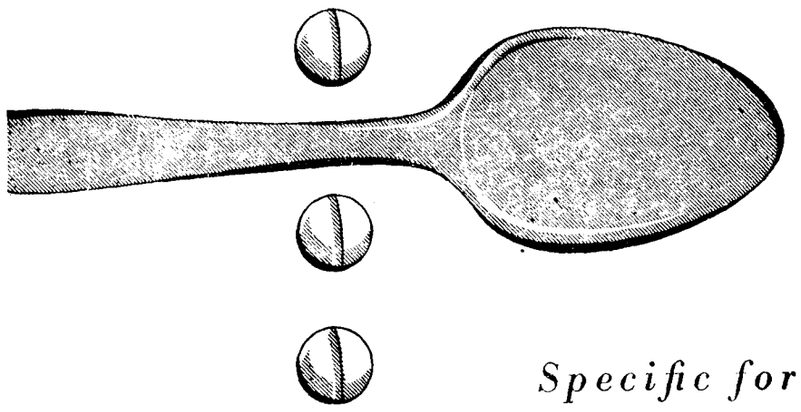

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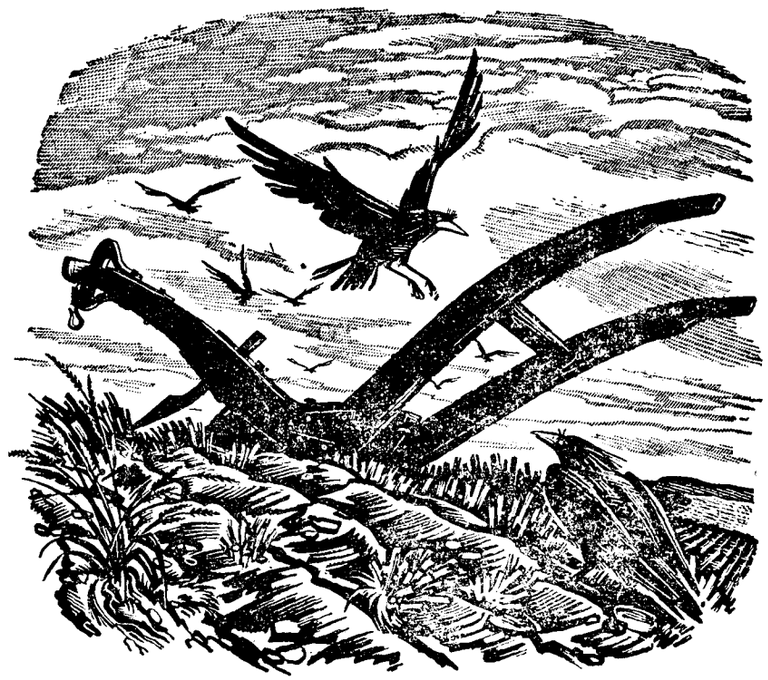

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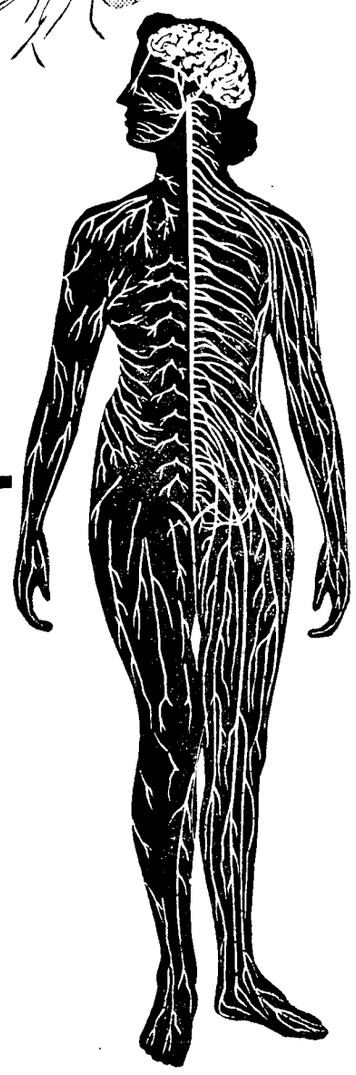

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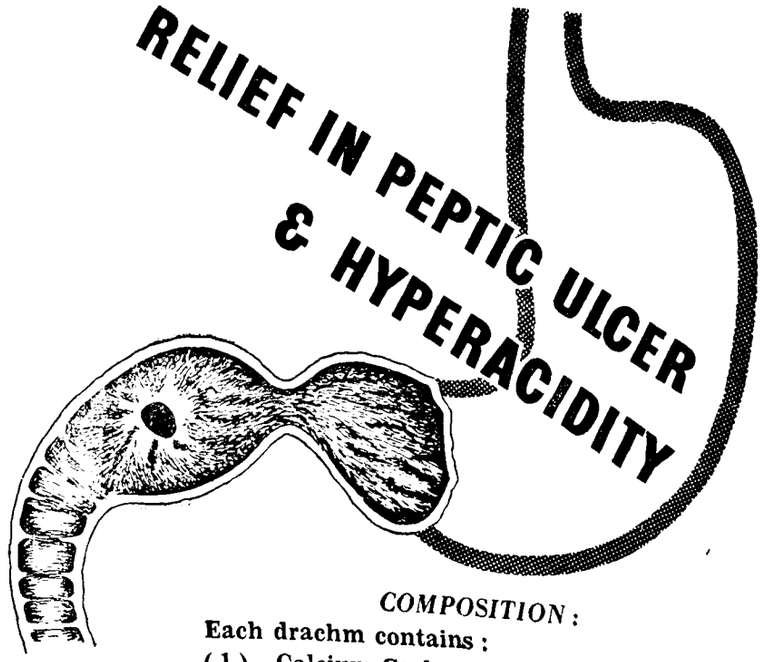

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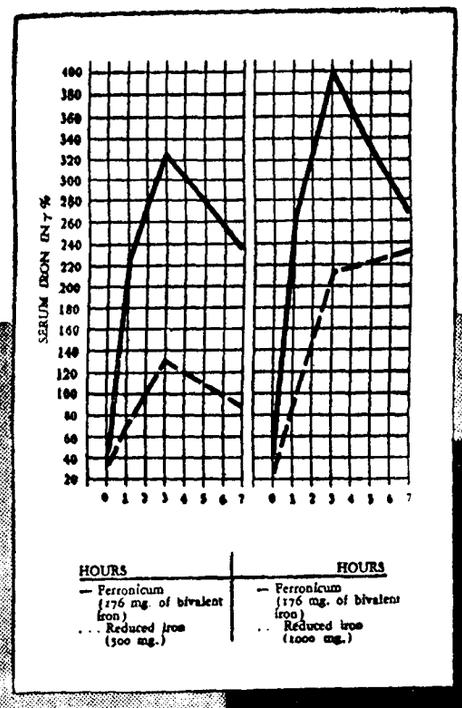

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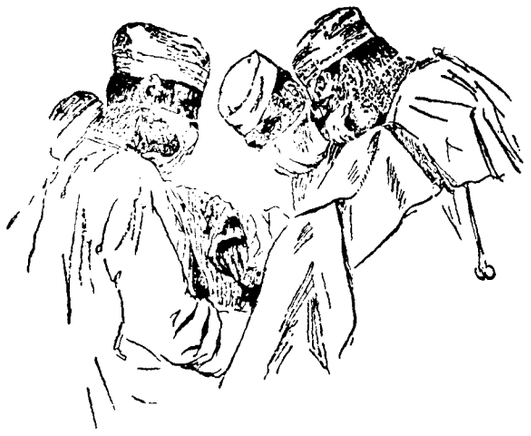

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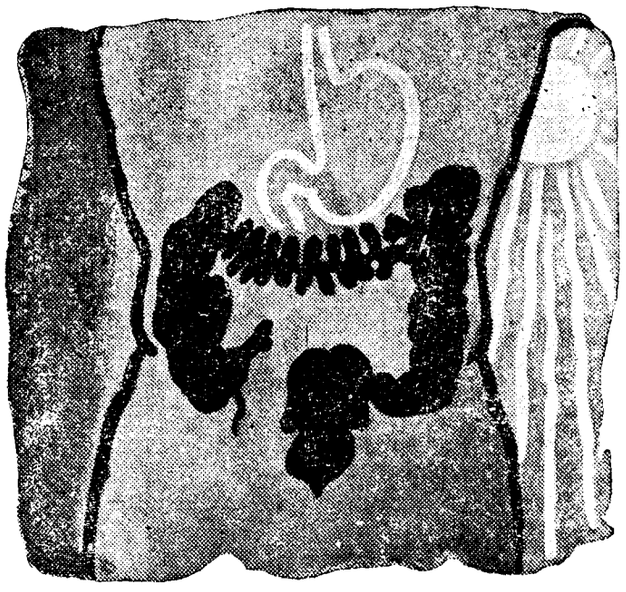


CARBO-GUANICIL

Adsorbent, disinfectant, astringent and normalizing peristalsis-comprehensive treatment of essential diarrhoea, food poisoning, meteorism and flatulence.

GUANICIL

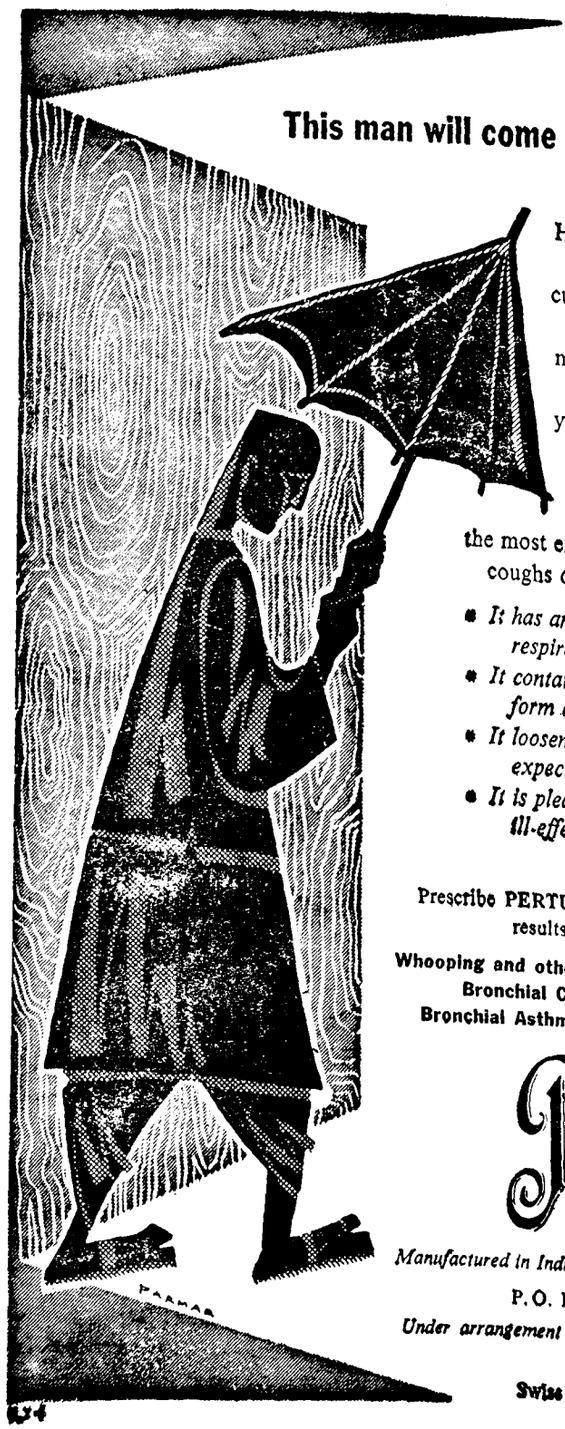
Selective and powerful bacteriostatic efficacy in the intestines—rapid and reliable action against acute and chronic infections.

CILAG *Swiss Pharmaceuticals*

CILAG-HIND LTD. 15, CAWASJI PATEL ST., BOMBAY 1.

NAS 54/53

This man will come to you tomorrow



He is a man with a cough and he will expect YOU to cure it for him. He is not very concerned with the methods you use—he is interested only in the results you achieve. And *that* of course will depend on what you prescribe. You will find that PERTUSSIN is the most effective remedy for coughs of all kinds because—

- *It has an antiseptic action on the respiratory tract*
- *It contains no narcotics, chloroform or creosote*
- *It loosens phlegm and makes expectoration easy*
- *It is pleasant-tasting and has no ill-effects on digestion*

Prescribe PERTUSSIN for rapid results in the treatment of

Whooping and other Coughs
Bronchial Catarrh
Bronchial Asthma

Pertussin
"TAESCHNER"

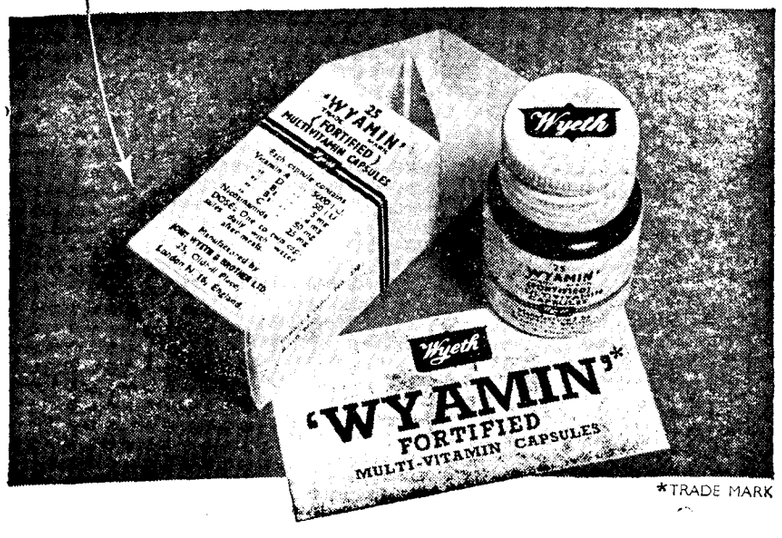
Manufactured in India by **infa LTD.** (infa)
P.O. Box 1041, BOMBAY-1
Under arrangement with **ETEPHA LTD.,**
Schaan, Liechtenstein
Swiss Custom and Economic Territory

634

malnutrition...

Numerous clinical studies have emphasized the value of supplementary vitamins in the management of malnutrition. 'Wyamin' Fortified deserves a prominent place in the treatment of nutritional deficiency conditions. It is a thoroughly reliable source of vitamins A, B_1, B_2, C, D and Nicotinamide in quantities especially adjusted to meet sub-tropical requirements. Presented as capsules, 'Wyamin' Fortified ensures uniform dosage and makes administration convenient.

Supplied in bottles of 25, 50 and 300 capsules



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JOHN WYETH & BROTHER LIMITED
Magnet House, Dougall Road, Bombay 1.
Distributors: GEOFFREY MANNERS & CO. LTD.
Bombay · Calcutta · Madras · New Delhi.

a new way

HIRUDOID

Heparinoid - absorbable by the skin.
isolated from animal organs
in a special absolutely-non-irritating
ointment form.

INDICATIONS:

Haematomas owing to injuries caused by accidents and in sports

Tenosynovitis - Bursitis
Inflammatory infiltrations, especially after injection and infusions

Varicose syndrome - Leg ulcers
Thrombophlebitis - Thromboses adjacent to the surface

Packings of 12 g. and 36 g.

LUITPOLD-WERK MUNICH

Manufacturers of: COMBIZYM, CLAUDEN, LUIZYM, etc.

For full particulars apply to:

NEO-PHARMA Limited,
Kasturi Buildings, Churchgate Reclamation, BOMBAY 1.

LIQUID

TABLETS

INTRAVENOUS

CROOKES

Easily assimilable IRON

CROOKES NEO-FERRUM is a stable colloidal ferric hydroxide with traces of copper and manganese. 1 teaspoonful contains the equivalent of 30 grains of iron and ammonium citrate. 1 tablet contains the equivalent of 15 grains of iron and ammonium citrate. Each 5 ml. ampoule contains 100 mg. of elemental iron in the form of a specially prepared solution of saccharated oxide of iron.

CROOKES NEO-FERRUM (liquid or tablets) is extremely pleasant to the taste and is tolerated by patients who previously have been unable to tolerate other iron preparations.

CROOKES NEO-FERRUM (Intravenous) is particularly indicated in cases not responding to adequate oral iron therapy whether through intolerance or a failure in absorption: in certain refactory anaemias and in all cases of iron deficiency when the haemoglobin level must be raised rapidly.

Full literature on request

Neo-Ferrum

LIQUID 4 oz. (114 ml.).
TABLETS Bottles of 50.
INTRAVENOUS Box of six 5 ml. ampoules.

THE CROOKES LABORATORIES LIMITED (Incorporated in England)
COURT HOUSE - CARNAC ROAD - BOMBAY 1

Prompt relief of gastrointestinal pain with

Antrenyl

Regd. Trade Mark

a powerful anticholinergic

reduces gastric motility
checks acidity
relieves pain

Indications:
gastric or duodenal ulcer, hyperacidity, gastralgia, gastritis, biliary and gastrointestinal spasms.

Dosage: One tablet four times daily which may be increased upto 6-8 tablets if necessary.

Packings: Tablets (5 mg.) Bottles of 30 and 100.

CIBA PHARMA LIMITED, P.O.BOX 1123, BOMBAY

Terra Firma

On the solid basis of world-wide medical experience, Terramycin is *known* to be effective... *known* to be well tolerated. Clinical proof consistently confirms these attributes.

Terramycin

brand of oxytetracycline

in gonorrhea

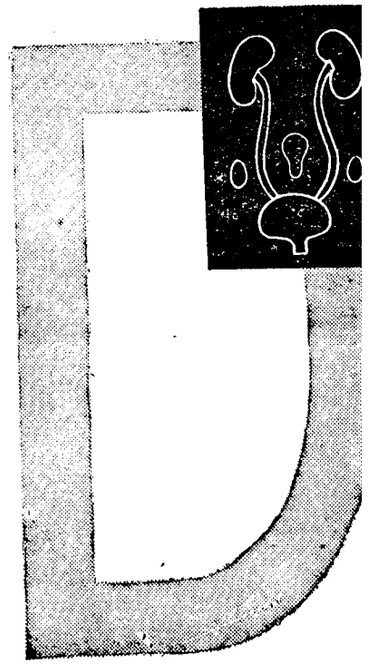
"Terramycin intramuscular is a valuable drug in the armamentarium for the treatment of gonorrhea in all forms, probable the best single preparation with which the author has worked..... Acute gonorrhea responds rapidly and totally to one injection."

Seid, B.: Antibiotics & Chemotherapy 4: 330, 1954.

in Granuloma Inguinale

"Terramycin is a valuable drug in the treatment of Granuloma Inguinale."

Whitaker, J.C.; et. al: Antibiotics & Chemotherapy 1: 208, 1952.



Pfizer

World's Largest Producer of Antibiotics

VITAMIN MINERAL FORMULATIONS

HORMONES

Exclusive Distributors in India:
RAVISON PHARMACEUTICALS LTD; P.O. Bag. 10020 Bombay 1. 'Grams: 'RAVIPH

IN DRUGS AND MEDICINES—No. 1

Prescribe

PYRAMID Glycerin for sore throats and dry coughs!

Sample prescription for dry irritating coughs:

℞

Diamorphine hydrochloride	1 gr.
Acid hydrocyanic dilute	15 m.
Syrup Tolu	4 dr.
Syrup Calci hypophosphite	2 dr.
Glycerin	ad 1 oz.

(Usual adult dose is one dram three to four times a day.)

Despite the discovery of many life-saving drugs over the years Glycerin still remains important as a basic essential material in medicine and no satisfactory substitute for it has ever been found.

Glycerin is NON-TOXIC

Glycerin has no toxic effect when absorbed internally into the human system. It is oxidised in the system as food.

Glycerin is a SWEETENER

Glycerin lends a sweet flavour to those liquid medicines which would otherwise taste unpleasant.

WHY PYRAMID GLYCERIN?

Because Pyramid Glycerin conforms strictly to B.P. standards and gives you extra safety and economy too! Sold in attractive factory-sealed 7 lb. tins Pyramid Glycerin is so easy to handle. There's no chance of wastage—it's fitted with a special pourer. Order your supplies of Pyramid Glycerin today.

Look for the

PYRAMID

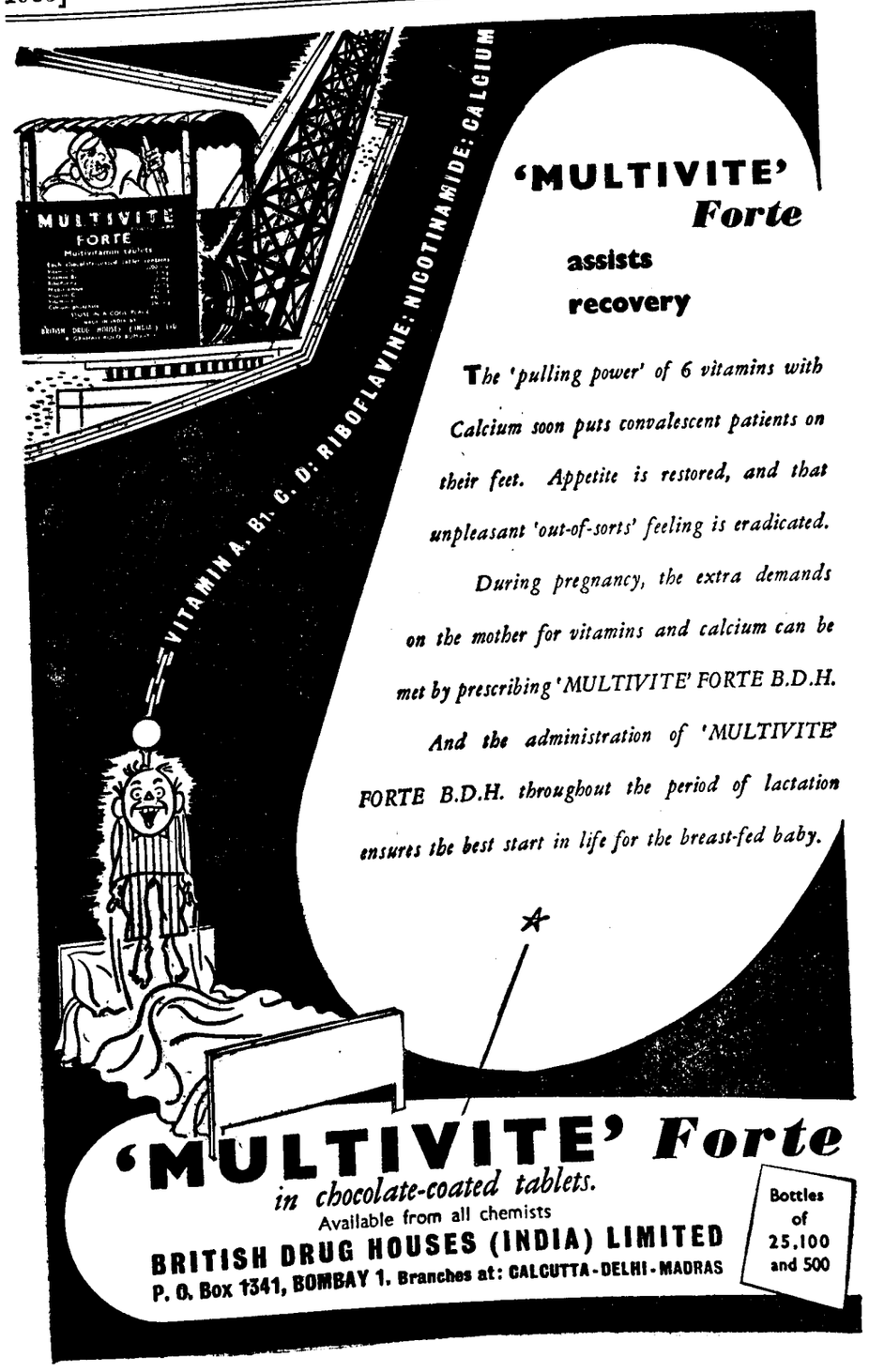
on this 7 lb. tin!

Also available in 28 lb., 56 lb., 1 cwt., 5 cwt. and 10 cwt. drums

EFFICIENT — PURE — INEXPENSIVE

PYG. 1A-25

MANUFACTURED BY LEVER BROTHERS (INDIA) LTD., P.O. BOX 409, BOMBAY, 1.



in resistant infections

of the respiratory tract

for Oral Suspension

provides intense antibacterial action

plus taste-tested palatability

FORMULA

Each teaspoonful (5 cc.) provides 100 mg. of 'Ilotycin' (Erythromycin, Lilly) as the ethyl carbonate and 0.167 Gm. each of sulfadiazine, sulfamerazine, and sulfamethazine. Supplied in 60-cc. bottles.

DOSE

Thirty-pound child, 1 teaspoonful q. 6 h.; others, in proportion to weight.

ALSO: Tablets 'Ilotycin-Sulfa,' 50 mg. of 'Ilotycin' and 0.333 Gm. triple sulfas per tablet.

Lilly

QUALITY / RESEARCH / INTEGRITY

ELI LILLY AND COMPANY OF INDIA, INC.
(Incorporated in the U.S.A., the liability of the members being limited)
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GERIATRICS

a new day has dawned for the elderly . . .

No longer need the spectre of old age haunt the elderly patient. In many cases the occurrence of senile infirmities can be traced to rapidly declining sex-gland function during the climacteric. 'Geriatone' has been specially designed to prevent the onset of symptoms of premature aging and imparts a sense of well-being and confidence. The introduction of this comprehensive steroid-nutritional compound makes a truly valuable contribution to the care of the elderly.

Wyeth

Bottles of 30 Capsules

GERIATONE*

STEROID-
NUTRITIONAL COMPOUND

JOHN WYETH & BROTHER LIMITED, LONDON
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J. 20

OCTINUM

Liquid • Ampoules

relieves spasms

The excellent antispasmodic action of octinum in spastic conditions of various organs is due to its twofold action:

(1) Direct relaxation of smooth musculature
(2) Stimulation of sympathetic end-organs.

Octinum succeeds where other less powerful spasmolytics fail, without producing any side effects.

KNOLL A.-G.
Ludwigshafen-on-Rhine
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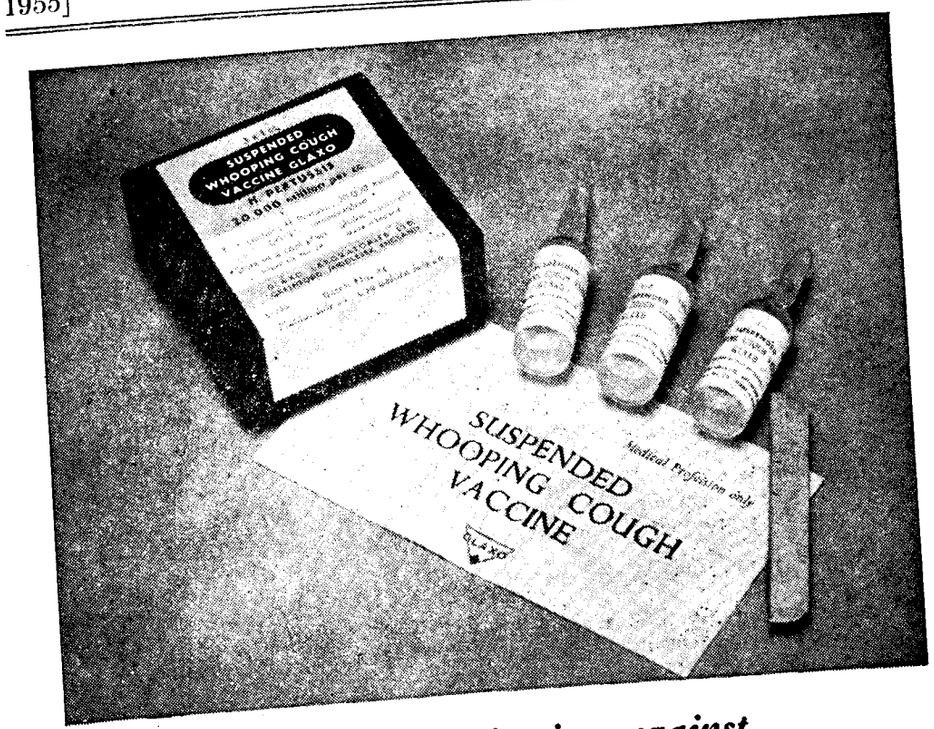


Progress in immunisation against Whooping Cough

Of all diseases of childhood, whooping cough is now the one with the highest mortality and morbidity rate. In some instances it can have a lifelong effect on the victim. But extensive trials (directed by the Medical Research Council, 1946-50, *British Medical Journal*, 1951, **1**, 1463) have shown that immunisation can give a high degree of protection against whooping cough and that success depends on the quality of the antigen employed. Glaxo Laboratories have devoted more than ten years' research to perfecting the techniques used in the manufacture of pertussis vaccine. The direct outcome of this research is Suspended Whooping Cough Vaccine 'Glaxo'—a saline suspension of killed H. pertussis that achieves high immunological efficiency and can be given subcutaneously or intramuscularly without untoward local or general reaction. The course is simple—three 1 cc. doses at intervals of four weeks.

SUSPENDED WHOOPING COUGH VACCINE

Saline Suspension of 20,000 *million H. pertussis per cc.*
Boxes of 3 × 1 *cc. ampoules*

GLAXO

GLAXO LABORATORIES (INDIA) LTD., BOMBAY - CALCUTTA - MADRAS

Alembic

ANTIBIOTICS PREPARATIONS
(Parenteral)

ALPROCIN

Procaine penicillin fortified with penicillin G sodium for aqueous injection. In rubber capped vials containing the equivalent of 400,000 units of penicillin.

DIPROCIN

A combination of two penicillins (procaine penicillin and penicillin G sodium) with dihydrostreptomycin sulphate.

BISTREPEN

A combination of two penicillins and two streptomycins:—procaine penicillin, penicillin G sodium, dihydrostreptomycin sulphate, and streptomycin sulphate.

COSTRECIN

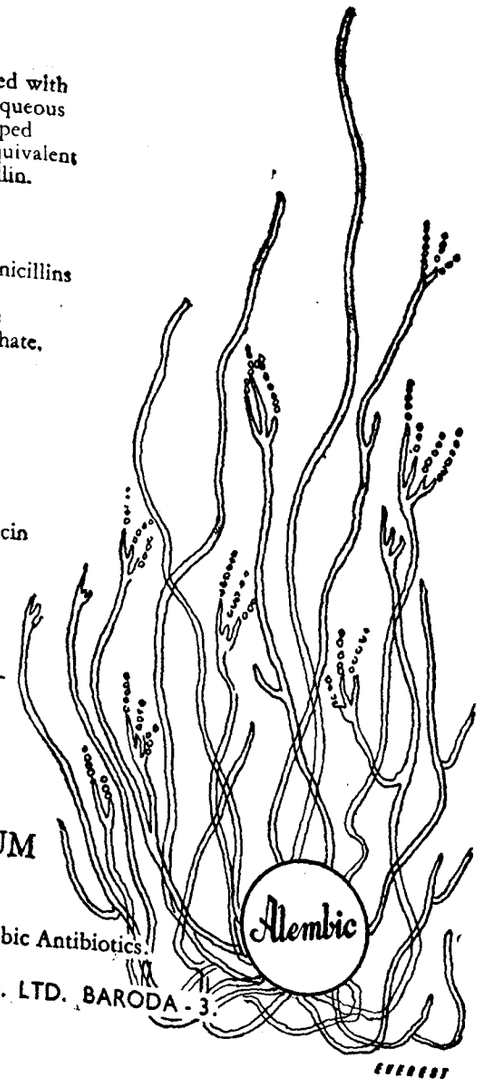
A combination of dihydrostreptomycin sulphate and streptomycin sulphate, in equal proportion.

CRYSTALLINE PENICILLIN G SODIUM

500,000 & 1,000,000 units.

Write for complete literature on Alembic Antibiotics.

ALEMBIC CHEMICAL WORKS CO. LTD. BARODA - 3.



The Super Calamine

Acne vulgaris and other all too common skin diseases often have no simple and straightforward remedy.

The unfortunate sufferer is usually very self-conscious of his appearance, so that even a mild acne appears to be a serious and repelling disfigurement.

The doctor is then called upon to prescribe something that will give not just a distant prospect of relief, but an immediate improvement in appearance.

CROOKES Lacto-Calamine

For the immediate improvement in appearance Lacto-Calamine is antiseptic and flesh tinted so that when applied with the finger tips the unsightly spots are hidden immediately.

THE CROOKES LABORATORIES LIMITED *(Incorporated in England)*
COURT HOUSE - CARNAC ROAD - BOMBAY-2

CB-6

Modern Sulphur Treatment in Dermatological Disorders

In practice the use of sulphur is restricted almost exclusively to topical application. Elemental sulphur is however inactive therapeutically, being oxidised in the presence of tissue fluids into polythionates, etc.

But polythionates are very unstable in solution and it is only recently that a stabilised solution has become available and has demonstrated its efficacy, most particularly in acne and seborrhoea.

DERMASULF

A cosmetically accepted, stable solution of polythionates for topical application in the treatment of all dermatological conditions where sulphur is known to be of value.

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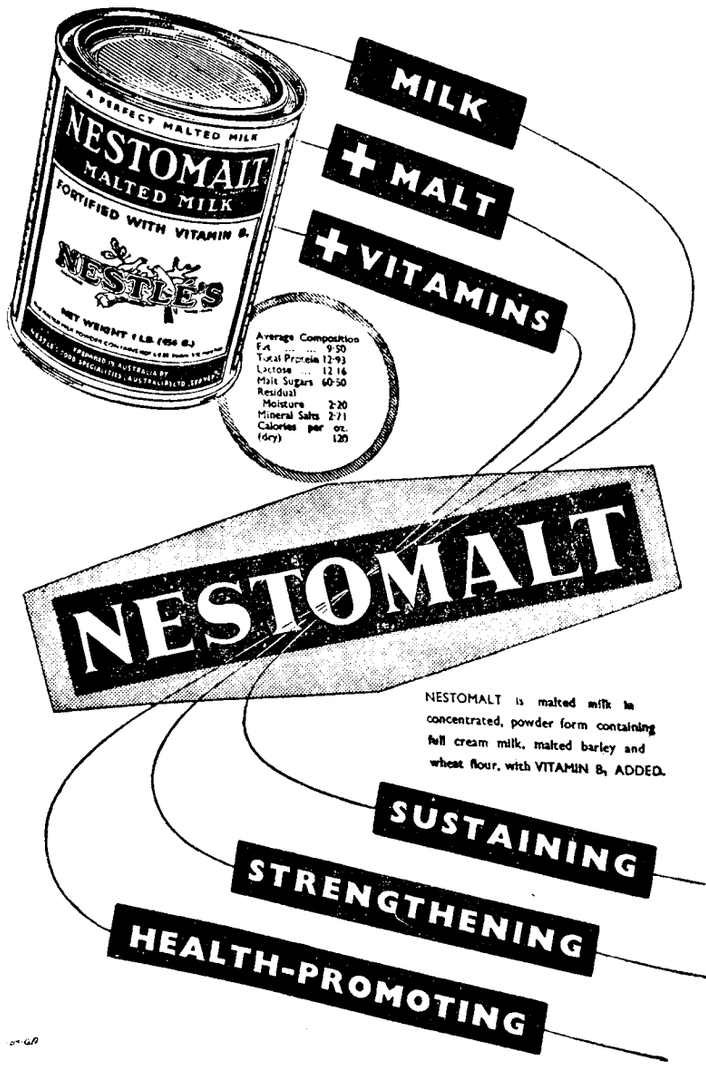

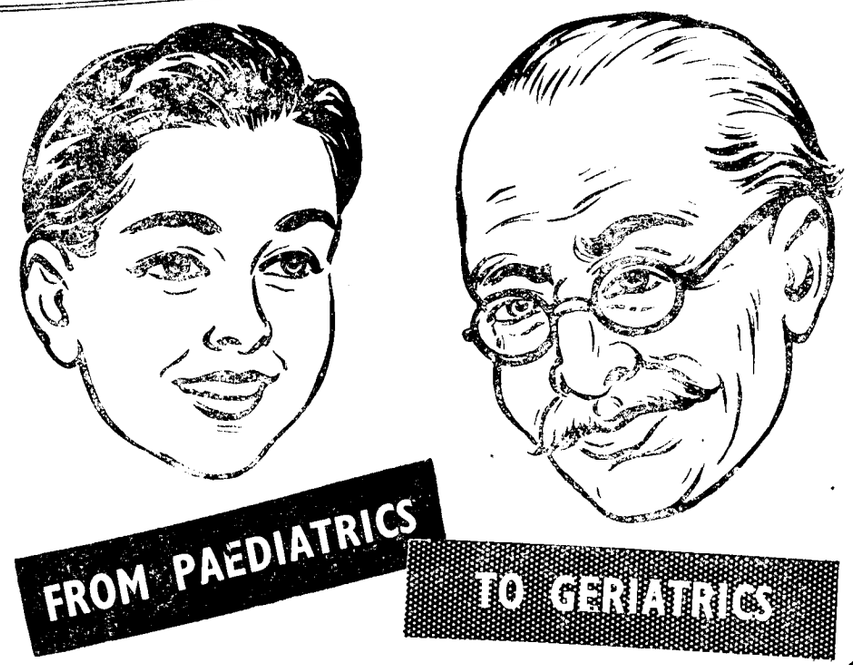

'B-G-PHOS'

SHARP & DOHME

'B – G – PHOS' Elixir supplies to patients of all ages the vital factors of the vitamin B-complex, reinforced with glycerophosphates of essential minerals in an extremely palatable base.

'B – G – PHOS' Elixir stimulates appetite, improves digestive function, restores vitality and is an extremely efficient tonic and nutritional supplement especially valuable during convalescence, pregnancy, and old age.

Each fluid ounce of 'B – G – PHOS' contains: 4.0 mg. of Thiamine hydrochloride (Vitamin B_1); 2.0 mg. of Riboflavin (Vitamin B_2); 0.1 mg. of Pyridoxine hydrochloride (Vitamin B_6); 30 mg. of Nicotinic acid amide; plus the glycerophosphates of Calcium, Sodium, Potassium and Manganese.

Supplied in bottles of 8 and 16 fluid ounces.

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SCIENTIFIC LITERATURE FROM BOMBAY, P. O. Bag 10008

PHB. 010

where PAIN is a symptom...

Therapy of the underlying causal condition is no doubt the prime consideration. However, when treatment of the basic disease does not or cannot afford prompt relief, 'ANACIN' will often alleviate the distress of pain and impart a sense of well-being.

ANACIN' is a non-toxic and clinically dependable preparation, specially formulated to provide a prolonged period of analgesia with a single dose of 1 or 2 tablets.

Composition

Quinine 1/4 gr. Aspirin 3 gr.
Phenacetin 3 gr. Caffeine 1/4 gr

ANACIN
ANALGESIC TABLETS

* In pilfer-proof containers of 32 tablets and packets of 2 tablets each.

as in
HEADACHE
TOOTHACHE
MUSCLE PAIN
RHEUMATISM
NEURALGIA
NEURITIS
DYSMENORRHOEA
INFLUENZA

* *Trade Mark*

Manufactured and Distributed by:
GEOFFREY MANNERS & COMPANY LIMITED, BOMBAY
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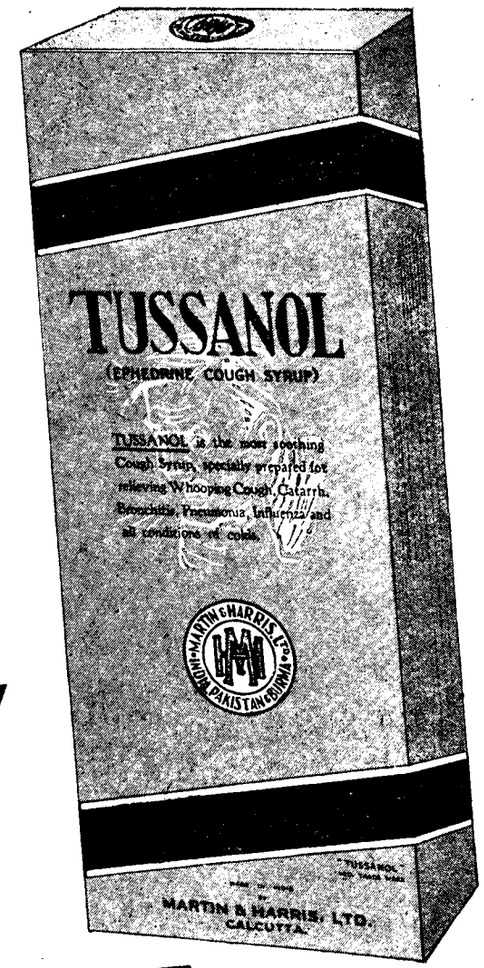
WHITEHALL PHARMACAL COMPANY, NEW YORK, U.S.A.

A 101

Cough!

when diagnosis demands a cough remedy a majority of physicians prescribe



TUSSANOL

(COUGH SYRUP)

THE SAFEST REMEDY FOR PATIENTS OF ALL AGES

A MARTIN & HARRIS PRODUCT

Standardised..
Reliable

The average Indian diet is poor in B vitamins. As a result, deficiency of more than one factor is common. Such mixed deficiencies are potentially serious and if not corrected may lead to conditions as diverse as macrocytic anaemia, neurological complications, cardiovascular disturbances, gastro-intestinal disorders, cheilosis, glossitis, etc. Symptoms such as anorexia, lassitude, insomnia, and depressive states are often due to B complex deficiency.

Complex B 'Glaxo' provides in standardised combination therapeutic amounts of its major components of B complex including vitamin B_{12}, the anti-anaemic factor. Complex B 'Glaxo' can be safely relied upon for a swift and satisfactory response in vitamin B deficiency syndrome.

Complex B GLAXO

VITAMIN B_{12}/B COMPLEX INJECTION

Each cc. contains :

Vitamin B_{12} (Crystalline)	10 micrograms	Nicotinamide	50 mg.
Vitamin B_1	10 mg.	Pyridoxine hydroch.	3 mg.
Calcium pantothenate	5 mg.	Riboflavine	1 mg.

In 10 cc. rubber-capped phials

GLAXO LABORATORIES (INDIA) LTD. BOMBAY · CALCUTTA · MADRAS

IT IS A FORTUNATE HEAD THAT NEVER ACHED

For providing quick and lasting relief from headache of whatever origin, Veganin Tablets are especially useful because they do not prevent the patient from continuing his usual occupation. Veganin does not cause drowsiness; it merely obliterates the pain and quiets the nervous manifestations.

Veganin is a compound of minimal doses of codeine, phenacetin and acetylsalicylic acid. The synergistic effect of these drugs of related action provides safe, analgesic, antipyretic and antispasmodic medication, because the full force of the individual drug is obtained without its accessory manifestations. There is no likelihood of after-effects or habit formation.

VEGANIN

Distributors :
MARTIN & HARRIS LTD.,
Mercantile Bldgs., Lall Bazar, Calcutta.
Also at Bombay, Madras and Delhi.

Prepared by :
WILLIAM R. WARNER & Co. Ltd.,
LONDON

WR 7

A Cardiotonic, coronary vasodilator and a diuretic in cardiac oedemas

PRIMCARDIN

MILD		FORTE	
Each Tablet Contains :		Each Tablet Contains :	
Aminophylline	1 gr.	Aminophylline	1½ gr.
Phenobarbital	1/6 gr.	Phenobarbital	2 gr.
Papaverine Hydrochloride	1/6 gr.	Papaverine Hydrochloride	1/2 gr.
Base	q.s.	Base	q.s.

Indications : Angina pectoris, Myocardial degeneration and infarcts, cardiac neuroses and œdemas resulting from cardiac insufficiency.

A product of

PRIMCO LIMITED,

Lamington Chambers, Lamington Road, BOMBAY-4.

Experience Prefers

PROVED TO BE A DEPENDABLE REMEDY THROUGH YEARS OF CLINICAL TESTS.

• *PLEASE CHECK UP THE NEW SCREW CAP ON QUMARESH PHIALS.*

QUMARESH

O.R.C.L.LTD.

QUMARESH HOUSE, SALKIA, HOWRAH.

for Liver and Stomach

To maintain protein intake

Dysentery and gastric troubles
Febrile conditions • Pregnancy and lactation
Pre- and post-operative treatment

It is well known that these conditions are often accompanied by protein depletion, resulting in a negative nitrogen balance. Further, the patient may be 'off his feed', and unable to benefit from the diet offered.

In such cases, Brand's Essence of Chicken is a valuable means of supplying protein, restoring a positive nitrogen balance, and returning the appetite to normal.

Brand's Essence of Chicken is a first-class protein of animal origin. Being partly hydrolised, it is capable of easy ingestion, digestion and absorption. The patient finds it extremely palatable, and may take it as a liquid or (when chilled) as a jelly.

BRAND'S ESSENCE OF CHICKEN
in 10 cc phials

Manufactured by: BRAND & CO., LTD., LONDON
Agents: GRAHAMS TRADING CO., (INDIA) LTD.
Calcutta - Madras - Bombay - Delhi

ESTY BRAND

The Mark of Quality

IN PROPRIETARY MEDICINES

ASPIRIN
A.P.C.
CALCIUM GLUCONATE
CALCIUM LACTATE
EPHEDRINE HYDROCHLORIDE
SACCHARIN
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SODA BICARB
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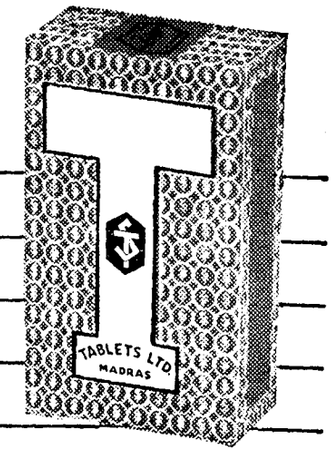

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TABLETS LIMITED

11/12, First Line Beach, Madras-1

TB/2

ABBC multi-vitamin elixir

FOR GENERAL DEBILITY & CONVALESCENCE

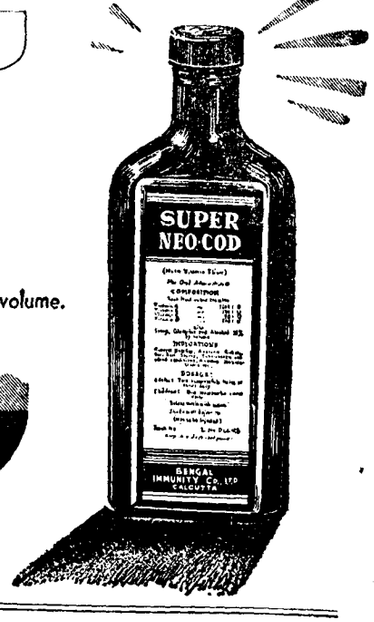
Composition

Each fluid ounce contains :

Vitamin A	....	1200 I. U.
Vitamin B_1	....	300 I. U.
Vitamin D	....	120 I. U.
Vitamin C	....	90 I. U.

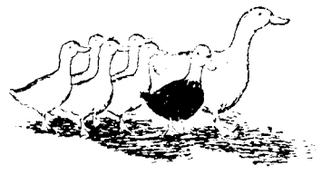
ith hydrolysed Sugar, Glycerin, Aromatics & Alcohol 15% by volume.

Presentation • Bottles of 6 oz. and 12 oz.



SUPER NEO-COD

BENGAL IMMUNITY CO., LTD. CALCUTTA-13



For both EXCEPTION and the rule

While functional constipation is usually founded on long-term neglect, exceptional circumstances often bring transient distress to otherwise careful individuals.

Dietary indiscretion, sudden change in environment, travel and other modifications in the daily routine are frequent exciting factors.

Whether constipation be the exception or the rule, the return to normal bowel function is favoured by the gentle moderating action of Agarol Emulsion.

AGAROL

Distributors:
MARTIN & HARRIS, LTD.,
Mercantile Bldgs., Lall Bazar, Calcutta.
Also at Bombay, Madras & Delhi.

Prepared by:
WILLIAM R. WARNER & Co. LTD.,
LONDON.

WH 4

SERPINA

Standardised 4 mg. total alkaloids of Rauwolfia serpentina (Benth) per tablet.

- Made from specially processed, blended, tested roots of Rauwolfia serpentina (Benth)
- A safe Hypotensive and Cardio-vascular sedative of precise therapeutic value.
- Uniformity of action controlled by biological and chemical assay.
- The pioneer, product endorsed by 20 years of clinical observation and research.
- Available in all the five Continents.

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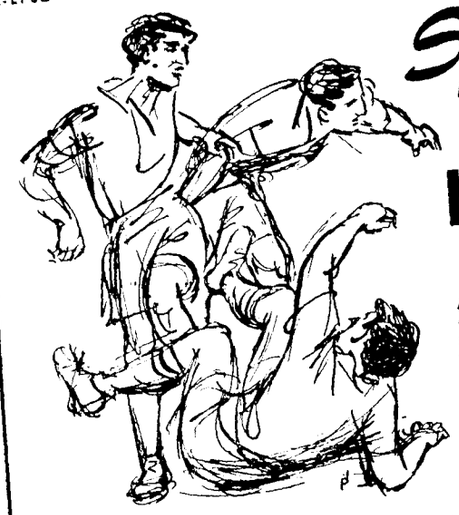

Sports Injuries!

LEUKOLASTIC

BANDAGES

All injuries to the joints, ligatures and muscles e. g. through dislocation, contusions, sprains, strains, also with effusion into a joint are best treated by means of a Leukolastic Bandage. Its amplified compression over the point of most intense pain gives successful and immediate relief. Leukolastic provides a firm support and greatly reduces the pain. It keeps the injured part at rest and yet ability to walk and often ability to work can be maintained.

MADE IN GERMANY BY P. BEIERSDORF & CO. A.-G. HAMBURG

ORIGINAL Beiersdorf PLASTER

Sole Agents for India:
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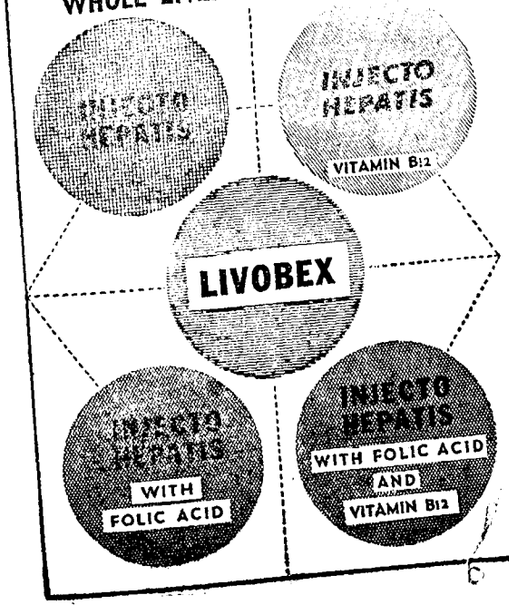
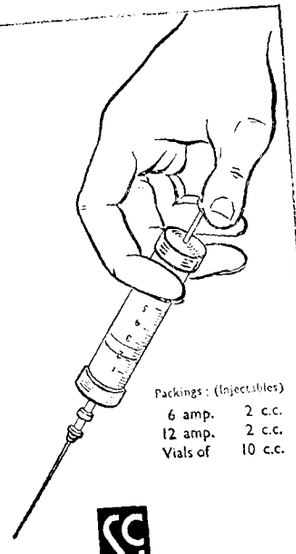
Conquest of Anemia

WHOLE LIVER EXTRACT PREPARATIONS





Packings: (Injectables)

6 amp.	2 c.c.
12 amp.	2 c.c.
Vials of	10 c.c.

THE SANITEX CHEMICAL INDUSTRIES LTD. BARODA 3

To Normalise MENSTRUAL ABNORMALITIES

OF VARIOUS KINDS FROM FUNCTIONAL & GLANDULAR DISORDERS

Re

HORMOSOKA

Contains

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PERFECT CYCLE

GLAND EXTRACTS OF ANT. PITUITARY THYROID & OVARY

VEGETABLE LAXATIVE, DECONGESTIVE, ANTISPASMODIC, SEDATIVE & TONIC

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TABLETS

A stimulating general tonic which improves the Uterine circulation and relieves the symptoms of Leucorrhœa.

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Working at an accelerated pace, with their daily routine disrupted, more people than ever ignore the urge to evacuate, thereby increasing the incidence of constipation. Agarol Emulsion provides deft and almost effortless supplementation to the finely balanced mechanism of normal evacuation. This smooth, palatable, free-flowing emulsion is geared to co-operate with natural physiological processes and to help to re-establish a regular schedule of bowel movements ..by retaining moisture in the stool, by supplying lubrication, and by mild stimulation of peristalsis.

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Prepared by :
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WR 3

FOR ALL DISEASES RESULTANT OF HYPOVITAMINOSIS

MUL-MIN

A multi-vitamin Tonic Syrup containing all the important factors of the Vitamin B Complex along with the Hæmatinic principles Folic Acid & Vitamin B_{12}, together with Vitamins A & D and the Lipotropic factors Choline and Methionine.

COMPOSITION :

Each fl. oz. contains :

Vitamin B_1	... 10 mg.	Choline Chloride	... 100 mg.
Vitamin B_2	... 5 mg.	Biotin	... 100 mcg.
Vitamin B_6	... 2 mg.	Inositol	... 50 mg.
Vitamin B_{12}	... 10 mcg.	P.A.B.	... 50 mg.
Folic Acid	... 1·5 mg.	Vitamin A	... 5000 I.U.
Nicotinic Acid Amide	... 150 mg.	Vitamin D	... 1000 I.U.
Calcium Pantothenate	... 20 mg.	Traces of Copper, Cobalt and manganese	
Methionine	... 100 mg.		

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GLUCOSE B_1.
(For Scientific Glucose Therapy)
TRIPLE DYE.
(For burns, cuts, etc.)
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(Efficacious in Eczema)
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5% Glucose in Normal Saline *(Pyrogen-free)* For intravenous, intramuscular hypodermic or rectal administration.

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AVAILABLE IN 540 C. C. TRANSFUSION BOTTLES.

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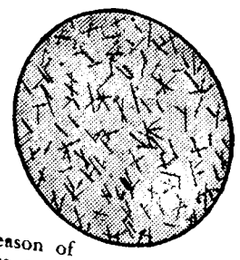
ANACOBIN VITAMIN B12

in macrocytic anaemias



Vitamin B_{12} is widely used in macrocytic anaemias, whether of nutritional origin, or associated with pregnancy or sprue.
The tonic effect of Vitamin B_{12} is well established, by reason of its influence on protein utilisation. It is indicated where convalescence is slow, following a debilitating illness or surgical operation.
'ANACOBIN' is available in four strengths to meet all requirements. 50 micrograms in 1 ml.—100 micrograms in 1 ml.—200 micrograms in 1 ml.—1000 micrograms in 1 ml.

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ANACOBIN TABLETS
for
GROWTH PROMOTION IN CHILDREN
10 micrograms tablets, bottles of 25 and 100
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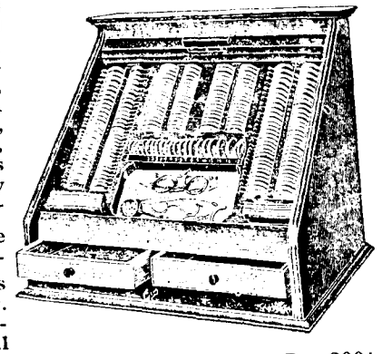

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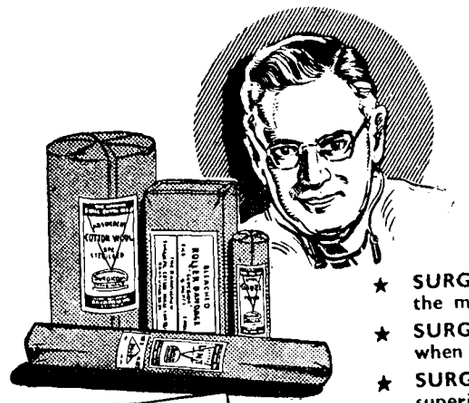

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ANTI-INFLAMMATORY HORMONE OF THE SUPRARENAL CORTEX
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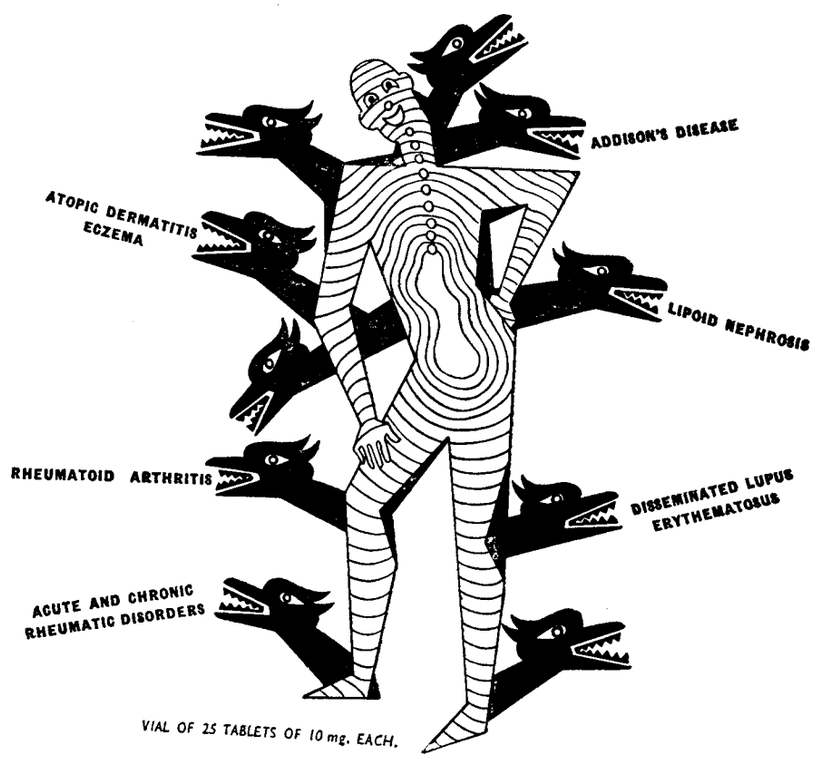
HYDROCORTISONE ROUSSEL
Tablets of 10 mg.
17-HYDROXYCORTICOSTERONE FREE ALCOHOL (not the Ester)



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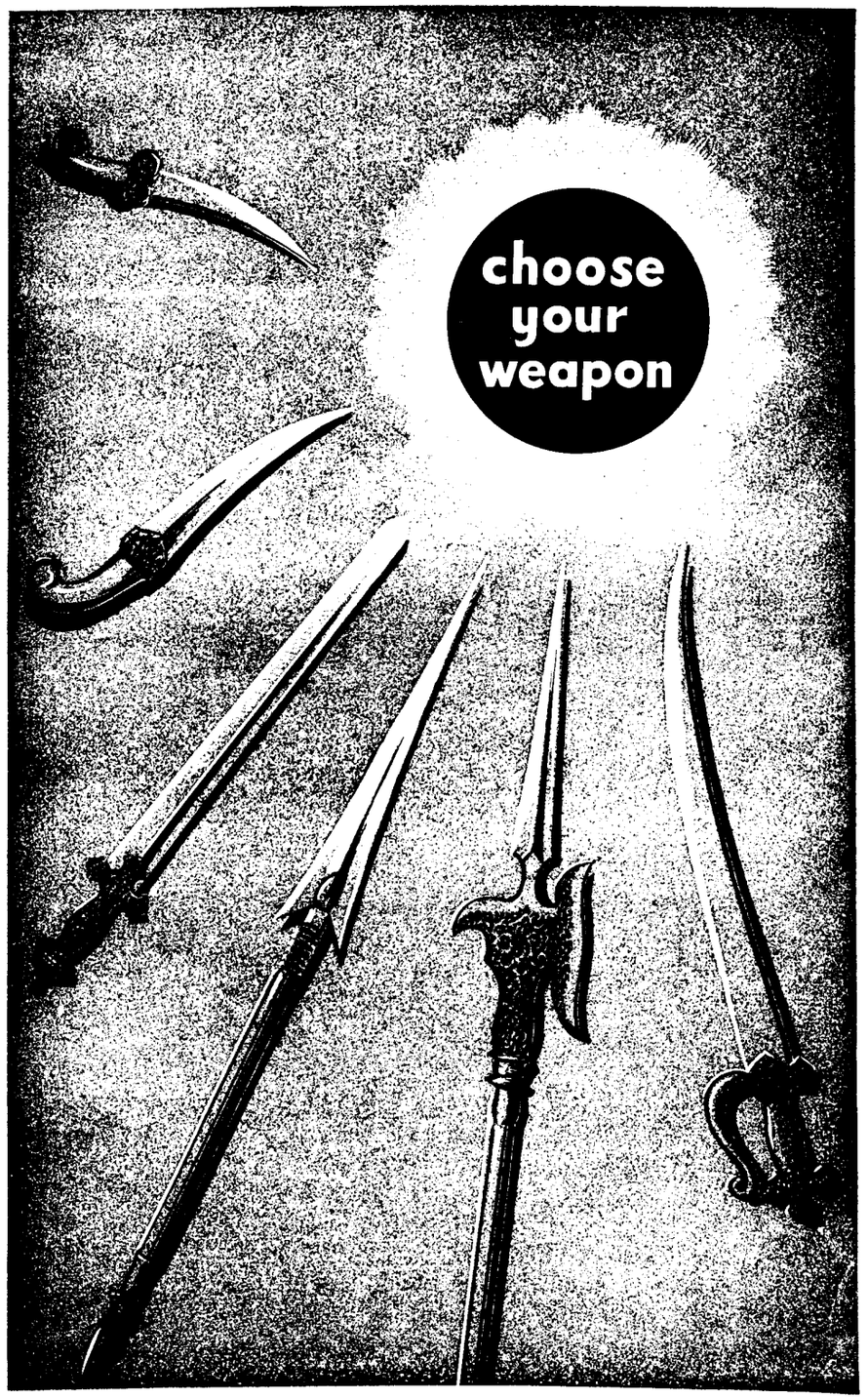

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Crystalline Penicillin G Sodium containing 1650 I. U. penicillin per mg. ...	Vials of	2 lacs 5 lacs 10 lacs
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One-gram formula :		
Duplomycin ... ... 1 gm.		
Crystalline Procaine Penicillin G ... 3 lac units	Vials of 1 dose	
Crystalline Penicillin G Sodium ... 1 lac units		
Half-gram formula :		
Duplomycin ... ... 0·5 gm.		
Crystalline Procaine Penicillin G ... 3 lac units	Vials of 1 dose	
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Dibenzylethylenediamine dipenicillin, the newly developed salt of penicillin		
Fortified for injection :		
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Tablets for oral therapy :		
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- ★ SYNERGIC ACTION
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THE MOST EFFICACIOUS COMBINATION YOU HAVE EVER HAD FOR TUBERCULOSIS ★

ISONIAZID, PAS ACID, VITAMIN C. DI-CALCIUM PHOSPHATE, VITAMIN D IN THE MOST APPROPRIATE DOSES

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... When salt free diet is prescribed

Ruthmol

— is an excellent substitute

Read what the Medical Review has to say :—

In prescribing a salt-free diet it is very difficult to find a substitute for chloride of sodium, but with RUTHMOL no difficulty need longer be experienced. This preparation has the flavour of salt, so that the patient no longer feels the want of the latter. RUTHMOL is a reducing agent as well as a powerful diuretic. It is of great value in cases of high blood-pressure and of obesity, but actually it may be prescribed with great advantage in every case in which salt is not permitted.

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– The Medical Review, Vol. XIV., No. 12, December 1951 –

By prescribing RUTHMOL which is * "most popular with patients" you secure the co-operation which is fundamental to successful dietary treatment.

* *British Medical Journal, 1936, 11,787.*

FORMULAE;
INGREDIENTS
Potassium Chloride 55.6%
Potassium Glutamate .2%
Inert excipients & flavouring 44.2%

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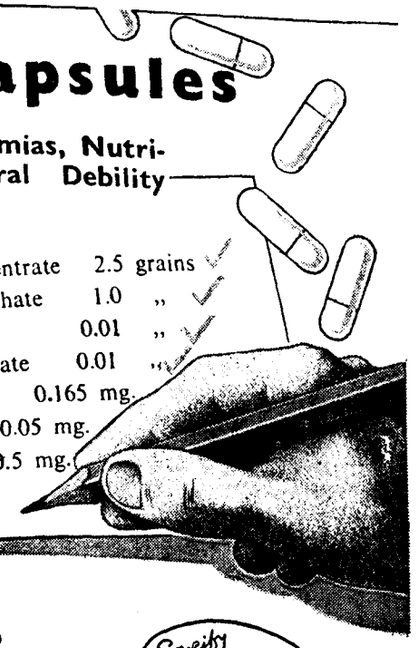
BRITISH ETHICAL PROPRIETARIES LTD.
Middle St., TAUNTON, ENGLAND.

LIVOX capsules

for the treatment of Anaemias, Nutritional Deficiencies, General Debility



FORMULA:

Liver Extract Concentrate	2.5 grains
Iron Glycerophosphate	1.0 ,,
Copper Sulphate	0.01 ,,
Manganese Sulphate	0.01 ,,
Vitamin B1	0.165 mg.
Vitamin B2	0.05 mg.
Nicotinamide	0.5 mg.

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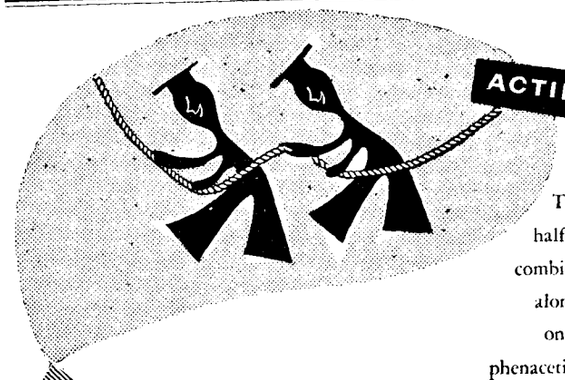
Specify OXOID BRAND



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Two similar drugs given together in half the usual dose may have a greater combined effect than a full dose of either alone. The formula of Veganin is based on this principle. The small doses of phenacetin and acetylsalicylic acid combined, have a greater effect than would a single dose (twice as large) of each used singly. These two drugs combined with codeine produce analgesia, sedation and lowering of abnormal temperature.

FORMULA: Each tablet contains 250 mg. acetylsalicylic acid, 250 mg. phenacetin, 10 mg. codeine, phosph.

PACKING: Tubes of 10 and 20 tablets.

VEGANIN

No Warner preparation has ever been advertised to the public.

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WILLIAM R. WARNER & CO. LTD.,
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AN APPROVED ANTIBIOTIC

PACKING:
PHIAL OF 12 CAPS x 250 MG;
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PALMITATE 50CC & 60CC BOT

IT IS MOST

RELIABLE *and* ECONOMICAL

IN THE TREATMENT OF **VARIOUS BACTERIAL INFECTIONS.**

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DIAGEL

Enzymatic Compound

DIAGEL

Enzymatic Compound

PEPSIN ... 3 grs.
DIASTASE ... 4 grs.
BAEL ... 20 grs.
ISHAFGUL ... 32 grs.

WITH OR WITHOUT iodo-chloro-hydroxy-quinoline

THE ORIENTAL RESEARCH & CHEMICAL LABORATORY LTD.
QUMARESH HOUSE,
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RYBARVIN INHALANT for ASTHMA

IT affords the most speedy relief yet known to Medical Science.

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WHOLE LIVER EXTRACT
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Each c.c. contains all anti-anaemic principles and extrinsic factors from 15 gms of fresh sheep liver with added standardised vitamins B_1, B_2, B_6, C and Nicotinamide.

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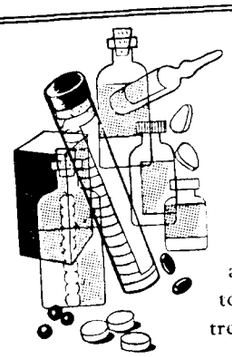


Self-Medication can be dangerous...

...especially for the dyspeptic

Only too often does the chronic hyperchlorhydric take his favourite antacid and aggravate his condition. It is easy to overdose with the usual alkalising treatments and cause acid rebound.

Agre Antacide promises well in this field. The doctor can advise a safe and effective compound, and the patient has wide dosage-latitude, both qualities leading to possible cure for the chronic sufferer and a more detailed examination of the etiology of the individual's condition.

Agre Antacide is not advertised to the Public

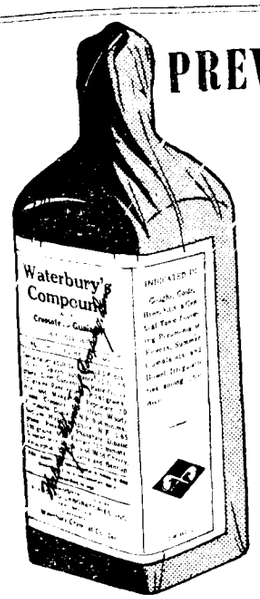
AGRÉ ANTACIDE

*Aluminium Glycinate

duphar

Sample and literature available from: 'PHILIPS HOUSE', CALCUTTA 20.

PSPH-107



PREVENTION IS BETTER THAN CURE

PROPHYLAXIS. When disregard of warning signals such as fatigue, loss of appetite and general debility, invites respiratory infections, then Waterbury's Compound will indeed prove timely.

GENERAL THERAPY. Waterbury's Compound will stimulate appetite, help to improve the blood picture and heighten that rather indefinable state known as a sense of well-being.

THE INTRACTABLE COUGH. The creosote and guaiacol in Waterbury's Compound will prove a therapeutic boon. The cough soon loosens and gradually diminishes in frequency.

CONVALESCENCE. Convalescence is still a few stages removed from complete recovery. It is best to continue prescription of Waterbury's Compound until danger of relapse is past.

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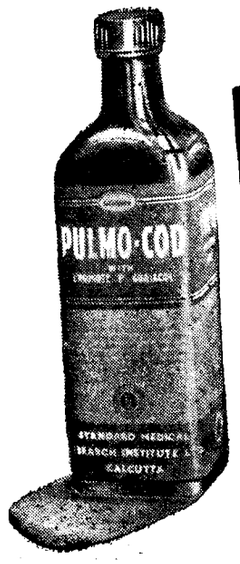
Mercantile Buildings, Lall Bazar, Calcutta. *Also at* Bombay, Madras and Delhi
Made in England by VINCE LABORATORIES Ltd., London, W. 4

WB-1



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In Case of Malnutrition and Wasting Diseases

PULMO-COD

WITH

Creosote & Guaiacol

Supplies
Minerals and generous amount of Vitamins

For Vigour and Vitality

Pulmo-Cod also prevents Seasonal Ailments, Cold, Cough, Bronchitis, Rickets, Summer Complaints, and Bowel Irregularities among Children

STADMED
PULMO-COD
(Creosote & Guaiacol)

Each fluid oz. contains:

Pancreatic hydrolysate of shark & Codliver Oil 50% v/v	
Vitamin A	4500 I.U.
Vitamin D	1000·0 I U.
Vitamin B_1	3 mgs.
Vitamin B_2	2 mgs.
Vitamin B_{12}	5·0 mcgs.
Nicotinic Acid	40 mgs.
Folic Acid	920 mcgs.
Sodi Hypo.	120 mgs.
Potassi Hypo.	120 mgs.
Calcii Hypo.	240 mgs
Creosote	1/3%
Guaiacol	1%
Extract Wild Cherry, Gentian, Eucalyp.	0·7%
Invert Sugar, Glycerine, Malt & Aromatics	q.s.

STADMED LTD.
15, JAWPORE ROAD.
CALCUTTA-30

Mg. L. No. DL 62 M
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OPIL

OPIMALT

Opimalt is a very palatable preparation in malted base of vitamins, calcium and iron which are of fundamental importance for the balanced functioning of the organism. Their therapeutic administration is desirable: (1) when their supply with the food is low; (2) during periods of increased need (growth, pregnancy and lactation); and (3) when the organism is under strain (disease, allergies, overwork).

COMPOSITION: Each fl. oz. contains;

Vitamin A	...	10,000 I.U.	Choline Chloride	...	25 mg.
Vitamin D	...	2,000 I.U.	Methionine	...	5 mg.
Vitamin B1	...	10 mg.	Inositol	...	2 mg.
Vitamjn B2	...	1 mg.	Ferrous Gluconate	...	300 mg.
Vitamin B6	...	1 mg.	Calcium Glycerophosphate	...	65 mg.
Vltamin C	...	100 mg.	Calcium Gluconate	...	130 mg.
Calcium Pantothenate	...	3 mg.	Malted Base	...	q.s.
Nicotinamide	...	30 mg.			

INDICATION: As a nutritious and assimilable food for children. During periods of increased need such as growth, pregnancy and diseases such as tuberculosis.

Available in bottles of 8 oz. and 16 oz.

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Indicated in baldness

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Stops falling of hair.

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Useful to everybody in all seasons.

TO BE HEALTHY AND TO KEEP FIT

Ask for our attractive ***Chart*** (Map) showing ***Yogic*** Asanas which will be sent on receipt of Rs. 1-12-0. These ***Asanas*** can be easily performed at home. ***Yogic*** classes are regularly conducted from 7-30 to 9-30 a.m. and evening 6 to 7-30 p.m. at the above address. (Sunday closed).

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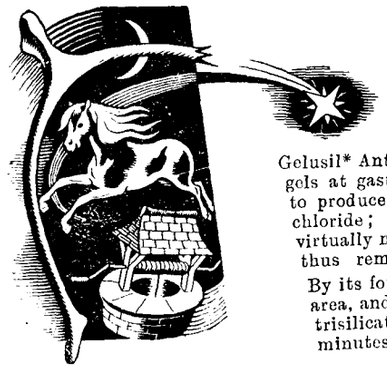

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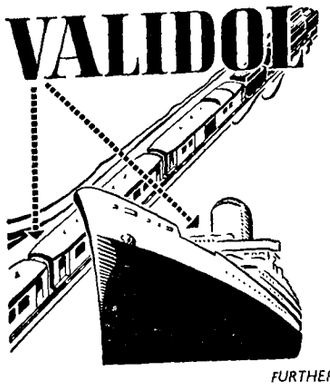

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TWENTYFIVE YEARS OF PROGRESS IN OBSTETRICS

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DURING the past 25 years, considerable progress has been made in the matter of making pregnancy and delivery safe. Reproduction is a normal physiological function, but very often pathological complications arise which warrant necessary pre-natal and intranatal care.

The current trend is in favour of a planned family for socio-economic reasons. Just as the care of the child should start before it is born, it is always desirable that a woman should seek medical advice before she becomes pregnant and find out whether there is any temporary contra-indication to conception—like rheumatic carditis, active pulmonary tuberculosis or untreated syphilis.

The earlier pregnancy is detected the better for the patient. Numerous biological tests have lately been discovered for the early diagnosis of pregnancy. Ascheim and Zondek in 1927 showed that by injecting the urine of pregnant women into immature mice, pregnancy could be diagnosed with 95% accuracy soon after the periods are missed. But this test required about 100 hours to obtain results. So other experimental animals were used by different workers to overcome the time-factor. Thus Friedman's test on mature female rabbits gives results in 24 to 48 hours. In 1933, Shapiro and Zwarenstein utilised female frogs, (*Xenopus levis*) and reduced the time still further—6 to 15 hours. In 1947, Mainini evolved the male-frog-test which gave in 2 to 3 hours results as accurate as Friedman's. This test is now preferred, being quick

and cheap. All these tests are based on the presence of large amounts of chorionic-gonadotrophins in pregnancy urine.

With the diagnosis of pregnancy confirmed, the patient is examined at regular intervals in an ante-natal clinic. Formerly, the physician had only malpresentations and contracted pelvis in mind while examining his patients. But, great importance is now given to her general health, and her physical and mental outlook. The nourishing quality of her diet rather than its calorific value, is most important; for there is definite evidence to show that dietetic deficiencies in the pregnant mother predispose her to toxæmia, inertia during labour and inability to breast-feed her infant. Unlike in experimental animals, it does not however, lead to congenital malformations. The birth-weight is affected only when there is gross malnutrition during the last trimester. Bourne and Williams state "If she takes milk (2 pints), cheese and green vegetables, there is no need for her to take calcium tablets, most of which are probably not absorbed or metabolised. A normally good diet needs no supplements. If it is suspected that the quality of the food is inadequate, she should be encouraged to take all the milk she can afford, orange juice, cod liver oil and ferrous sulphate." Iron and multi-vitamins may be usefully prescribed in the last trimester.

The pregnant woman should be weighed at periodical intervals —particularly during the last trimester when the weight-gain will fluctuate most. If the gain in weight is about 2 pounds per week or more, she should be watched and treated for toxæmia. Blood-pressure readings of over 130 mm. Hg. systolic and 90 mm. diastolic indicate this condition. Every pregnant woman who visits the modern ante-natal clinic gets her blood examined for its hæmoglobin content, blood-grouping, Rh-typing and for Wassermann reaction. Anæmia is common in pregnancy and is an important cause of maternal death in South India. Normally, hypochlorhydria and the fœtal demands on the maternal store of iron are liable to make the patient slightly anæmic. But very severe anæmia is seen only in those, who are already anæmic and become pregnant. The commonest type of anæmia is that due to want of iron which responds promptly to oral iron therapy. Best results are however obtained with intravenous iron therapy. In about 15% of these anæmias, it is a dual deficiency which shows good response to iron and folic acid treatment (Menon). Every patient whose hæmoglobin is 50% or less should be hospitalised and thoroughly investigated and treated. In 1940, Landsteiner and Weiner discovered the Rh antigen in the red blood cells of 85% of the population. As it is a Mendelian dominant, it is inherited by the offspring. In a couple where the father is Rh positive and the mother Rh negative, antibodies are likely to be produced in the mother and passed into the fœtal circulation producing disastrous effects on the fœtal red

blood-cells—resulting in erythroblastosis fœtalis—manifesting as icterus gravis, fœtal hydrops or congenital anæmia of the newborn. Fortunately, Rh antigen is a weak antigen and the incidence of the disease is very low, 1 in 350, as compared with 15% in Rh negative individuals. It is unlikely to produce abortions but may be responsible for premature labour and still-births. Rh typing of the parents and estimation of the antibodies in the pregnant mother will help in the diagnosis and treatment; and the child when delivered should be given exchange transfusion of Rh negative blood of the same group as its own or 'O' (universal) group blood. Great care is therefore, necessary in giving blood transfusion to any female patient during her reproductive period. The fœtal salvage-rate from syphilis has been high after the introduction of the routine examinations of blood for Wassermann test. In the city of Madras alone, about 6% of the pregnant women examined show a positive response to this test. Syphilis does not cause abortions before the fifth month, but later on it may give rise to interruption of pregnancy—premature labour, repeated still-births or neonatal deaths. Early detection and treatment of syphilis during pregnancy with penicillin combined with 2% aluminium monostearate has reduced the fœtal mortality and morbidity from 82% to less than 10 per cent during recent years (Rajam). Arsenic and bismuth are no longer used. In the antenatal clinics, the pregnant woman along with others, receives a brief course of instructions as to the changes occurring during pregnancy, the mechanism of labour and the part she has to play. This is designed to dispel fear and ignorance and infuse confidence into her at the time of labour so that she will co-operate better with the physician and the nurse. This training for child-birth is psychologically important.

Another important and recent advance is in the use of radiology in obstetrics. Caldwell, Moloy and D'Esopo (1934) by their study of prenatal and intranatal radiography have given us a rational classification of the pelvic variations in women and how these morphological types will affect the outcome of labour. They have corrected some of the errors in our understanding of normal labour and thereby helped us in the proper management of pelvic arrests (Caldwell *et al*). The X-rays have come as a valuable aid in the management of borderline disproportions. Pelviradiography, pelvimetry and cephalometry have been the subjects of extensive research, and a spate of research papers has been the outcome during the past 2 decades. By adopting the methods of Caldwell *et al* or Moir, a correct prognosis of the outcome of labour is now possible in about 75% of such cases and many unnecessary Cæsarean sections have thereby been avoided. X-rays have been used to detect malformations and malpresentations. The advances in roentgenographic diagnosis of placenta prævia are fascinating. In 1933, amniography was done by Munroker, but invariably it led to premature labour. In 1934, Snow described pneumocystography

with better results. Four years later, Ude and Urner utilised sodium iodide solution for cystography, to see whether placental tissue intervened between the fœtal head and the bladder. But the latest method is soft tissue radiography or direct placentography—first introduced by Snow and Powell in 1934 and since perfected by other workers. This technique will show the placental site with 80 to 90 per cent accuracy—though Moir has pointed out numerous pitfalls in its interpretation.

'Toxæmias of pregnancy,' (chiefly pre-eclampsia and eclampsia) continues to be a controversial subject in obstetrics with its cause still undiscovered. The toxins from the intestines of the patient, from the placenta or from the fœtus were formerly suspect. The present-day view leans towards hormonal disturbances. Increased activity of the suprarenal cortical hormone, the excess of chorionic gonadotrophins or diminished blood-levels of œstrogens and progesterone have been suspected to give rise to a chain of events leading to this symptom complex of toxæmia of pregnancy. Nutritional status has a definite relation to the incidence of pre-eclampsia and eclampsia as they occur mostly in malnourished individuals in the lower-income-groups. Dieckmann was able to induce toxæmia by injecting sodium chloride to pregnant patients and believes that sodium retention is an important factor in its ætiology. But what exactly brings about the sodium retention is yet a matter for speculation and further investigation.

Treatment.—The present-day treatment for pre-eclampsia consists therefore of rest, sedatives, restriction of sodium to not more than 2 g. per day, diuretics, hypertonic glucose and vitamin supplements. The early detection and proper management of pre-eclampsia will minimise the incidence of eclampsia cases which, in Madras City alone number over 400 annually. Electroencephalography in pregnant patients has shown that in those cases where there is cerebral dysrhythmia, eclampsia is more likely to occur. The treatment for eclampsia is again conservative, consisting of sedatives or anti-convulsants, hypertonic glucose, vitamins and prophylactic penicillin therapy against aspiration pneumonia. The pregnancy is terminated by artificial rupture of the membrane per vaginum if the cervix is ripe; else, an abdominal delivery is resorted to, as the patient improves definitely when the uterus is emptied. About 5 to 10 per cent of the patients die; but the remote prognosis is good except for the residual hypertension which may give rise to recurrent toxæmia. There is definitely no renal damage in toxæmia, apart from a rare condition of cortical necrosis of both the kidneys.

Hormonal therapy in obstetrics was unknown 25 years ago. Progesterone is prohibitive in cost, and is useful only, in large doses, in cases of threatened abortion where the pregnandiol level in the urine is found to be low. Otherwise, it will be wasteful.

Chorionic gonadotrophins have been used in threatened and habitual abortions. Oestrogens are given to pregnant diabetic patients and in large doses also before pitocin therapy in cases of missed abortion.

Twentyfive years ago, to relieve pain in labour, we had only sedatives like chloral, bromide, morphia and finally the anæsthetic-chloroform, which is too powerful and toxic to be entrusted to nurses. Subsequently in 1932 paraldehyde was used and only more recently, Pethidine. To relieve the pain in the second stage of labour, Minnit's researches gave us a safer effective combination of gas and oxygen, 50 per cent of each. Trilene has been used in obstetrics only during the past 11 years. Friedman's apparatus (1943) delivers an inconstant strength of trilene and so is not suitable for routine use. With the more recent cyprane inhaler, the vapour contains about 0·5% trilene and is effective. Caudal anæsthesia was described in 1933 by Cleland but continuous caudal came into use only in 1942; but this method is impracticable in domiciliary practice because it needs an expert anæsthetist. Spinal anæsthesia in obstetrics, which is favoured by some has been condemned by Greenhill as the "most dangerous anæsthesia for pregnant women." He has advised since 1933 local anæsthesia (pudendal block) for vaginal delivery. Painless childbirth advocated by Dick Read is not absolutely painless but is only comparatively less painful and requires some analgesic in the second stage. It removes the fear and the tension by education, assurance and relaxation exercises before delivery. It is really "childbirth without fear."

Another advance is in the management of abnormal uterine action. The normal and abnormal contractions of the uterus have been studied by numerous workers like Reynolds, Nixon, Jeffcoate, Caldeyro Barcia and Alvarez. As a result of their studies and observations we now understand clearly the normal behaviour of the uterus during labour and the not too infrequent abnormalities in uterine action. Primary uterine inertia or sluggishness of the uterus in the absence of a disproportion and malpresentation is treated on conservative lines with pethidine and later, if required, with a pint of 5 per cent dextrose containing 5 units of pitocin by intravenous drip. The ætiology of other varieties of abnormal uterine action has also been appreciated except perhaps that of constriction ring dystocia.

With the introduction of pelvi-radiography, fœtopelvic relationship can be assessed more easily. Not only the size of the pelvis but its shape, at the brim and at lower levels, must be considered. The trial labour in border-line cases is conducted with greater confidence but with as much care as before. When it fails, lower segment Cæsarean section is performed. With better nutritional standards, pelvic contraction is becoming rarer and less severe than

before. With increasing safety (operative mortality about 0·5%), the indications for Cæsarean section have increased; originally performed almost solely for contracted pelvis, it is now done also for placenta prævia except of the lateral type, concealed accidental hæmorrhage, toxæmia, primary uterine inertia, constriction ring, diabetes, erythroblastosis, cord prolapse, etc. The present trend is to do the lower segment operation only, whenever Cæsarean is indicated, even in central placenta prævia—unless there is some specific contra indication for this type, as in constriction ring dystocia, when the classical Cæsarean must be done.

A larger number of low forceps deliveries are also being performed now. In the second stage, the fœtal head is not allowed on the perineum for longer than half an hour. If, with good pains, it does not come out, forceps will have to be applied even before obvious evidence of fœtal distress sets in. This has reduced the number of stillbirths and neonatal deaths and prevented a lot of damage to the perineum of the mothers.

The physiology of the third stage of labour has been carefully studied in the past two decades by Brandt, Warnekros and Burton-Brown who have shown that placental separation normally occurs in 3 to 5 minutes and the third stage is completed in 5 to 10 minutes. Prophylactic administration of 0·5 mg. ergometrine intravenously after the delivery of the posterior shoulder has greatly reduced post-partum blood loss. There is no risk of hour-glass contraction, when ergometrine is used in this way. Manual removal of the placenta is now considered a safe procedure and is indicated whenever the placenta is retained and there is hæmorrhage and in cases of adherent placenta. When the placenta is adherent, there may not be any bleeding; but if it does not get separated in about 15 to 20 minutes, it should be removed manually, under suitable anæsthesia. In some countries, flying-squad teams have been organised to render aid to patients living far away from the hospital when complications of second and third stages arise.

Great precautions are observed during delivery to minimise sepsis. Vaginal examinations are reduced to a minimum and antiseptics like dettol are much used. If labour is delayed for longer than four hours after the rupture of the membranes, penicillin is given prophylactically. It is always used routinely whenever vaginal examinations are done and in cases of operative delivery. The introduction of sulphonamides in 1935, penicillin in 1939 and the newer antibiotics during the past 7 years has made puerperal sepsis a rare event and when it does occur an easily controllable condition. On discharge from the wards a week after delivery, the woman attends the postnatal clinic at short intervals till the end of the puerperium. When puerperal sterilisation is indicated or desired, it is done within 48 hours after delivery through a small abdominal incision.

The improvement in antenatal care and attention to the diet of the patients have greatly reduced the complications of pregnancy. The X-rays have helped in the detection and management of cephalopelvic disproportion. Pain during childbirth is abolished, and with a proper understanding of the physiology of the different stages of labour, we are able to manage deliveries with greater ease, skill and care. Blood transfusions, have come in handy for combating postpartum hæmorrhage and shock. Chemotherapy and antibiotics have helped to prevent and treat puerperal sepsis. As a result of all these modern advances the pregnant woman can now be safely conducted through labour and puerperium and discharged quickly from the hospital with a live healthy child, who would add to her happiness.

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TREATMENT OF INCOMPLETE ABORTION

There are two opposing schools of thought in regard to the treatment of incomplete abortion. One school advocates interference (early uterine curettage) in every case; the other does not interfere (curette) in any case. Incomplete abortion connotes remnants of products of conception, before viability, still within the uterine cavity, complicated or not by hæmorrhage of varying intensity, by infection (septic or putrid) or by both. A positive or incontestable diagnosis of incomplete abortion can be made, only, on the microscopic finding of chorionic villi in uterine curettings.

The method of immediate interference in the septic type was fraught with one great danger, *viz.*, of breaking down the leucocytic wall of Bumm, the first and most potent local defence-mechanism against extension of the infection beyond the endometrium, the channels were opened-up for rapid extension of the septic process. The method of non-interference, on the other hand, would allow non-infected remnants to become foci for uterine hæmorrhage, infection and, possibly, the development of placental polypi also, an already infected process would be allowed to progress into more serious even fatal phases, such as thrombophlebitis, septicæmia, generalised peritonitis and death. The method of interference was too radical; and that of non-interference too conservative. The need, therefore, of an intermediary or compromising method was apparent and desirable. Dr. Ross of Howard University, Washington reports a study of 600 consecutive cases of incomplete abortion treated successfully by certain definite procedures. The earliest possible recognition and hospitalisation of infected abortion, is necessary to secure maximum benefit.

Method:—All cases are given a preliminary vaginal-specular examination to ascertain whether or not secundæ are visible within the cervix or vagina and to note patency or not of the external os. If found, the remnants are removed immediately with placental or ovular forceps.

Incomplete abortion (non-septic):—Women who had aborted and whose chief complaint is vaginal bleeding or spotting and with no history, signs or laboratory evidence of infection, are put to bed and prepared for a therapeutic uterine curettage, as soon as practicable, followed by the use of sulphatherapy and antibiotics for two to three days. Blood transfusions and fluids are given as necessary.

Use of this procedure in the management of this type of incomplete abortion proved most satisfactory. The curettement is done in order to remove retained secundæ, to stop the bleeding, to avoid a locus for the initiation of infection and to prevent subinvolution and the possible development of placental polyp.

Incomplete abortion (septic):—The diagnosis is made on history, fever (continuous or remittent), chilliness or chills, rapid pulse, leucocytosis, rapid sedimentation rate and a soft, tender uterus. These cases receive, also, endocervical cultures, hæmatocrits, blood-typing and cross-matching, Rh factor determination and coagulation time. A careful digital-rectal exploration is done to determine whether or not the infection has progressed beyond the confines of the uterus with a resulting parametritis, paraproctitis or paracystitis. Posterior colpotomy with free drainage is the resort when extension has occurred. This insures the best prophylaxis against further tissue destruction, toxic absorption or possible rupture into the peritoneal cavity, the rectum or the bladder—all serious but preventable complications. Free use is made of the ice bag and coal tar derivatives for pain, and non-specific protein therapy is administered when indicated. Fluids and blood transfusions are given as needed. The increasingly favourable results show that, instituted in time, this method offers the safest, soundest and most satisfactory therapeutic approach.

Cases of infected abortion, with generalized peritonitis, even in extremis, should be given sulphatherapy and antibiotics as early as possible, followed by use of the Wangensteen suction apparatus or the Miller-Abbott tube as indicated; celiotomy, under light ether or evepal anæsthesia, with adequate abdomino-vaginal drainage; fluids, transfusions and oxygen are administered as needed.

If the infection is confined to the endometrium, sulpha-therapy and antibiotics are used for, while the prophylactic wall of Bumm is preserved by the avoidance of uterine curettage and strengthened by the use of pituitrin or ergot, its role is essentially passive or defensive; and it is thin and penetrable to septic bacteria.

Incomplete abortion (putrid):—This type of abortion is encountered far less frequently (about 7 per cent) than the septic type; putrid or sapremic endometritis can be readily diagnosed by history, intermittent temperature from 97°F to 104°F or above, chills, elevated pulse, leucopænia and a uterus which is soft, tender, painful on contractions and emits a plenteous, greenish and malodorous discharge; the interior of the uterus is ragged and shaggy. Prompt evacuation here, is feasible and rational because the leucocytic wall of Bumm is thick and impenetrable to the saprophytic bacteria. Moreover, sulpha and antibiotic therapy is administered pre-operatively and for at least three days post-operatively to augment the prophylactic process.

Since the veins of the uterus are devoid of valves, adequate uterine drainage becomes an integral part of the proper treatment of incomplete abortion (infected or noninfected). This is readily accomplished with an open cervical canal and the Fowler position, as an effective measure, against uterine congestion, œdema, discharge, subinvolution and delayed infection.—(*Journal of the National Medical Association*, Sept. '54).

FEAR IN CHILDBIRTH

The pain of normal childbirth is almost negligible in the absence of fear. Relief from the discomforts of labour is found in the mind of the woman herself, not in the phials and philtres of the physician.—(Grantly Dick Read, *Western Jour. of Surg. and Obst.*, Dec. 1954).

DIET IN PREGNANCY

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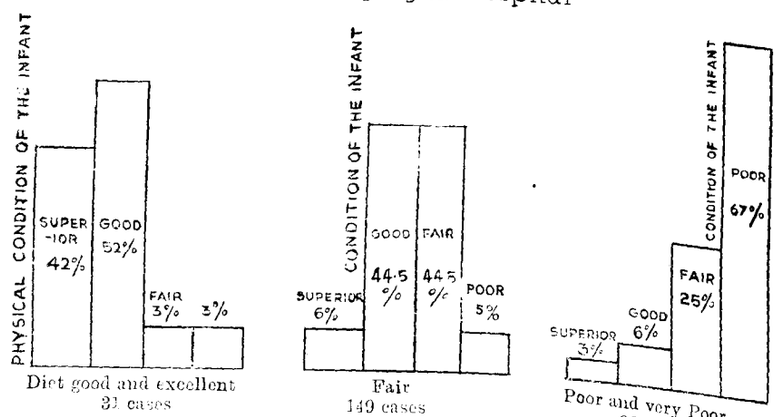
Pregnancy is a normal physiological process but as it is incidental to conception and extends only for a specified period during which certain changes occur in the reproductive organs and in the hormone balance, it differs from other normal functions of the human body. During pregnancy, the fertilised ovum grows within the uterus which has to adapt itself to the growth and accommodate the growing infant. To meet the increased needs resulting from this condition the mother should have proper and adequate nourishment, or both mother and fœtus stand to suffer. It is therefore, necessary that pregnant mothers should be given proper instructions in the matter of their diet during pregnancy. Deficiencies in the diet of the pregnant mother have been shown even in western countries to affect the course of pregnancy and labour and also the health of the mother and child. Such deficiencies are therefore, bound to tell even more severely on the pregnant women of our country, where poverty and malnutrition are the rule.

If the health of our people and particularly of the pregnant and lactating mothers is to be maintained at a fairly high level, our diet should be improved so as to include all the essential and accessory food factors in proper proportions. Of the different essential food factors, protein is the most important as it plays a large part in the cell metabolism of the body. Animal proteins are considered to be superior to vegetable proteins as they are more readily assimilated and have greater biological value. In India, the food as prepared and eaten by our people is poor in quality and insufficient in quantity. Religious scruples, likes and dislikes and other considerations have stood in the way of many people taking to animal proteins. The pregnant woman is thus ill-equipped to face pregnancy in ease and comfort. Even in Western countries where conditions of living and the quality of food are very much better, we find, from available statistical records, that a number of women are on inadequate diet when they conceive. These reports also furnish information on various aspects relating to the importance of diet in pregnancy and the relation of maternal diet to the growth and development of the fœtus. Pregnant women were classified into 3 groups :- (1) those who were able to have good diet which was satisfactory in all respects; (2) those who could afford a diet which was supplemented by essential factors; and (3) those who were on a poor diet. The last group served as controls. Among these

were found cases of abortion, premature labour, post-partum hæmorrhage, toxæmias of pregnancy and still-births.

The chart below serves to illustrate the relation of prenatal nutrition to the physical condition of the infant at birth and in the first 2 weeks of life.

Boston Lying-in Hospital



Relation of prenatal nutrition to the physical condition of the infant at birth and within first two weeks of life (From Burke, Beal, Kirkwood and Stuart)

A summary of the report on the above runs as follows :—

"In 216 cases, all the stillborn infants, all the infants who died in the neo natal period, all premature infants, most of the infants with major congenital defects and all the infants considered to be "functionally immature" were born to women in the poorest diet group. In contrast, 94 per cent of the infants, born to mothers on good or excellent diets during pregnancy, were in good or excellent physical condition at birth. There were many more difficult types of delivery in the poorest diet group, despite the fact that these infants at birth averaged almost 3 pounds lighter in weight and several centimetres shorter in length than the infants of mothers whose diets were good or excellent."

Reports from Leningrad, Holland, Hongkong and other countries relating to the effects of deficiencies in diet during the Second World War, show that amenorrhœa in women was common during the period of starvation, and the condition improved when the food position improved. Pregnancies and admissions to maternity hospitals were fewer among the poorer people, in the lower income group; and the women seeking admission were generally from the higher classes. The low incidence of toxæmia during the war-years in the Western countries was manifestly due to the inadequate and unbalanced diet, poor in proteins, calcium salts and vitamins but rich in carbohydrates. Under normal peace conditions it has been

recognised that the woman, who is normally in a good state of health prior to pregnancy, suffers from morning sickness and poor appetite during the first trimester and consequently loses weight. But soon she gets adjusted herself to the change in her hormonal balance and begins to gain in weight during the second trimester, usually half a pound per week. During the third trimester the increase is a pound per week. The total increase during pregnancy in Western countries has been computed to be in the neighbourhood of 22 to 25 lbs, while in India under the conditions of inadequate nutrition the increase is usually not more than 12 to 15 lbs at term, in the case of women belonging to the higher income groups and not over 12 to 13 lbs in the poorer classes. In the matter of weight-increase, one thing has to be remembered *viz.*, that a rapid and sudden increase by 2 or 3 lbs in any week and a total increase above the normal, indicates that there is water-retention which should be combated, since it is a precursor of toxæmia of pregnancy. Rest and restriction of salt-intake should then be enjoined.

A non-pregnant woman needs about 2000 calories by way of food. When a woman becomes pregnant she requires an increase in calories by about 20% in order to meet her energy requirements which vary with the weight and the activities of the woman during pregnancy. Proteins, carbohydrates and fats are the essential foods which provide the energy requirements or calories.

Proteins.—Ordinarily one gramme of protein per kg. (2·2 lb.) of body-weight is considered necessary for proper nutrition. The National Research Council of Great Britain has laid down that a pregnant woman should have 85 g. of protein every day, to enable the vital processes of the body to be carried out. The end products of protein metabolism—amino acids, are responsible for growth and tissue-repair and for the maintenance of the nitrogen balance in the system. These readily cross the placental barrier in the pregnant woman and reach the fœtus enabling it to develop. In the later stages of pregnancy, proteins are helpful to the future process of lactation, as they assist in the production of milk in greater quantity and of a richer quality. Proteins also help in raising the prothrombin and fibrinogen levels of the pregnant woman's blood and thereby afford protection against hæmorrhages.

Proteins are of two kinds : animal and vegetable proteins. The former is found in milk, cheese, eggs, meat and poultry etc. while the latter is found in leafy vegetables, legumes, some fruits, cereals, wheat and rice. Amino-acids from animal proteins are stated to be more readily absorbed and utilised by the tissue cells. Vegetable proteins, most of which yield non-essential amino-acids can only partly replace animal protein and therefore form only accessory sources of supply. As stated before, inadequacy of proteins in the pregnant woman's diet, will cause depletion of cell-protein, resulting in nutritional œdema, anæmia, poor muscle tone, cramps

in the calf muscles and a lowering of the body resistance to infection. The fœtus will also suffer in consequence. Nitrogen balance will be maintained only if adequate and suitable proteins are consumed. The storage of nitrogen starts during the first trimester and continues till confinement. It begins to be negative during the puerperium and further depletion occurs during lactation. The lactating mother should therefore, have more nitrogenous food during the entire period of nursing the baby. Milk is the ideal protein food for pregnant and lactating mothers and should be supplied to all pregnant woman during pregnancy, in sufficient quantities. To those who cannot afford to buy milk—and these constitute the vast number in India—Governments, municipal and other public bodies and philanthropic institutions should provide the required quantity of milk to all such pregnant women, as is done in Western countries and to a very limited extent in some of the larger cities in India. Of the total 2400 calories required daily by a pregnant woman not less than 15 per cent should be derived from good proteins. Carbohydrates should provide one half of the calorie requirements, and fats the remaining 35 per cent.

Carbohydrates.–The fœtus derives its share of the carbohydrates in the form of glucose brought to it through the placenta, through which it diffuses readily. The pregnant woman should avoid taking an excess of carbohydrates, as it may cause fats to be deposited in excess and unduly increase her weight. Carbohydrate deficiency is also injurious as the body will have to draw its energy from the other constituents *e.g.*, proteins. This would cause a disturbance in the nitrogen balance in the mother and interfere with the growth of the fœtus. The mother should therefore have an average of 250 g. in her daily diet to maintain the proper carbohydrate level.

Carbohydrate deficiency during the first trimester may cause vomiting; when sufficient glucose is not carried to the hepatic cells, the glycogenic function of the liver is interfered with, creating a Keto-antiketogenic disturbance. Ketone bodies which are formed bring on autonuria, noticed in the early months of pregnancy from increased vomiting, and in the later months as a result of toxæmia. Even a slight carbohydrate deficiency over a prolonged period may cause fatigue on slight exertion, general weakness, and also fits of fainting. In these conditions, intravenous glucose is indicated.

Fats.—The daily requirement of fats is from 103 to 109 gr. as it is a source of energy and is essential for calcium metabolism, and for the carrying and proper utilization of the fat-soluble vitamins, *viz.*, A, D, E, and K.

Fats do not pass as such though the placenta but as fat-lipids which are used by the fœtus particularly in the latter part of its intra-uterine existence.

Minerals.—Calicum, phosphorus and iron are of equally great importance in the dietary of the *enceinte* woman and her diet should therefore, contain adequate supplies of these minerals in an easily assimilable form.

1. *Calcium* is found mainly in bones and teeth, as deposits of phosphates and carbonates to the extent of 99%. A small proportion of the ingested calcium gets distributed in the extra and intracellular and in the cerebrospinal fluids It is present in the blood plasma as the ions and proteinates of calcium in the proportion of 10·5 mg. to 100 cc. of blood. The elimination is through the kidneys.

The unabsorbed calcium is excreted through the fæces. The threshold for Ca in the kidneys is 7 mg.; the blood entering the kidneys has 3 5 mg. more of calcium which is passed in the urine, causing a reduction in the blood calcium level. When this occurs, the parathyroid gets active and secretes more of its hormone, which mobilises the calcium from the bone to restore the blood calcium level. The deposition and absorption of calcium in the bone are incessantly going on. When intestinal absorption is greater than the excreted calcium, a positive balance is set up and deposition occurs on bones; but in a state of negative balance, the breakdown and removal are effected through the osteoclasts.

A pregnant woman requires 1 g. of Ca per day in the early months and 1·5 during the later ones, when the fœtal demand also increases. A fœtus has about 5·1 of g. of Ca in its body during the first six months but at full term this figure rises to 30·5 g. The calcium intake by the mother should therefore, be sufficient to maintain the skeletal structure in good condition and to provide the needs of the growing foetus. Most of the calcium in the food, is absorbed in the upper part of the small intestines, where the gastric contents reaching it are still acidic. An alkaline or neutral medium is not conducive to Ca absorption. Proteins and lactose are stated to aid in calcium absorption. Milk cotains both of these substances as lactalbumin and lactose: milk is a perfect food by itself for rearing an young child. In addition to the protein and sugar, it contains fat as butter (Vitamin A & D). The absorption of Ca is thus greatly facilitated. The importance of atleast a quart of milk in the daily diet of the pregnant mother cannot be sufficiently emphasised; and to the women who are strictly vegetarians, milk is the most valuable and only source of animal protein and calcium. During lactation she should have more of milk in order to meet her own and the baby's demands for calcium, protein and vitamins. Women who do not like milk as such, can have instead, curds, skimmed milk powder, cheese, *chas* etc. Eggs also contain calcium and protein and 2 eggs per day may be used. But they are liable to cause allergy in susceptible people

more than milk. Calcium salts, as calcium lactate, together with Vitamins A and D may be prescribed but these can never be good substitutes for milk. A deficiency of calcium may cause in pregnant women, headache, cramps in the arms and legs, and insomnia. Some consider calcium deficiency to be a contributory factor in the causation of eclampsia.

2. *Phosphorus.*—The question of supplying this element is not so difficult as calcium, for it is found in most of the constituents in a mixed diet; thus it is found in milk, fish, eggs, poultry, plantain fruits and in some vegetables also to a smaller extent. The daily requirement of 1·32 g. by a pregnant woman can be had in the daily diet provided she takes a good meal. Both calcium and phosphorus metabolism requires a suitable supply of vitamin D. In practice, a Ca : P ratio of 1 : 1·5, if maintained in the diet with daily exposure of the body to the sun's rays, and an adequate quantity of vitamin D will meet the normal needs of the pregnant woman. The fœtal metabolism of Ca and P is intimately connected with that of the mother and so the administration of vitamin D to the pregnant mother as and when required will be necessary to prevent rickets in the baby.

3. *Iron:*—is necessary for haemoglobin formation and haemoglobin carries oxygen to the tissues. Woman normally suffers blood loss during her periods and during pregnancy. The rapid growth and development of the uterus and the foetus during pregnancy involves the using up of extra blood. A loss occurs also during confinement, particularly during the third stage of labour. The fœtus stores up iron in its system during the latter months of pregnancy. All these causes tend to impoverish the quality of the maternal blood. In order to replenish this loss, 15 mg. to 20 mg. of iron per day are considered essential particularly, in the latter half of pregnancy.

Anæmias:—The anæmias frequently noticed during pregnancy is due either to iron deficiency or deficiency in diet. In the former, the Hb is below 10 g. per 100 c.c. and the colour index is 0·9 while in the latter the blood cell count is less than 3·5 million per cmm. and the volume index is over 1·1. This deficiency is due to lack of proteins in the diet. In India we meet with yet another type of anæmia, *viz.*, the macrocytic, also due to dietary deficiency. Protein deficiency can be countered by the daily intake of 50 mg. of animal protein, if the anæmia is of moderate intensity. In severe cases and in macrocytic anæmia liver therapy, combined with folic acid and Vitamin B_{12} are found to be useful. The microcytic being the more common type, iron in ferrous form should be administered throughout the entire period of pregnancy, so as to prevent possible complications later on. The foods containing iron are: lean meat, liver, eggs, potatoes, dried and fresh fruits, green vegetables, legumes, whole grains cereals and molasses.

Iodine:—A deficiency of iodine is not usually seen except in goitrogenic areas and when a woman does suffer from goitre, Pot. iodide should be given during pregnancy.

Vitamins are accessory but vital food factors, which play a very important part in human metabolism for regulating the various vital processes constantly going on in the system. Some function as catalysts *e.g.*, enzymes and coenzyme essential for the metabolising of carbohydrates, proteins and fats.

Vitamin A:—Is fat-soluble like Vitamin D with which it is often associated. It is obtainable from animal and vegetable sources. In the fishes it is found stored in the liver. Animals obtain their supply in turn from vegetable sources in the shape of pro-vitamin A or carotene, which occurs in plenty in carrots and other green vegetables with an yellow colour. The carotene ingested by animals is metabolized by the liver cells and stored there as Vitamin A. Vitamin A as such occurs in fish liver oils, milk and eggs and carotene is found in carrots, most green vegetables, sweet potatoes and fruits such as apricots, yellow peaches and plantains. Puerperal morbidity is believed to be much less in women who have beenr eceiving Vitamin A or pro-vitamin A in adequate quantities during pregnancy. As it is stored up in the liver, it comes in handy during the latter months of pregnancy. Vitamin A does not pass the placental barrier in any appreciable quantity, but during lactation the infant gets it through the breast milk which is thus a good prophylactic against Xerosis conjunctivæ.

The pregnant woman requires 800 i.u. daily of Vitamin A which is obtainable from a daily diet consisting of a quart of milk, an egg, a moderate helping of butter, an yellow fruit like apricot, and some green vegetables like cabbage, spinach, carrot or sweet potato.

Vitamin D:—Is also fat-soluble and is found in fish liver oil, egg-yolk, fatty fish and to a less extent in butter and cheese. It promotes calcification in the fœtal structures, and prevents congenital rickets. Given to the pregnant mother, it helps in the transport of Ca and P to the fœtus. This vitamin exerts a favourable influence on the course of pregnancy and labour, prevents abortions and premature labour besides the other beneficial effects recorded in previous paragraphs. A lack of it predisposes the patient to toxæmia of pregnancy. In repeated pregnancies, the calcium deficiency due to want of vitamin D may lead to osteomalacia. Post-partum hæmorrhage may also result.

Vitamin E:—Also fat-soluble, is found in wheat germ, whole meal bread, lettuce, and green leafy vegetables. This vitamin in medicinal form is freely administered in the hope of preventing abortions and premature labours It is also given to women who become pregnant after several years of sterility.

Vitamin K:—also fat soluble, is found in intensely green leafy vegetables, spinach, cabbage, cauliflower, carrot tops and in soya

bean oil. It increases the prothrombin level of blood and is useful in the hæmorrhagic diathesis of the new-born infant.

Vitamin B complex:—comprises a large group of water-soluble compounds, the most important of which are Vitamin B_1 or Thiamin, Riboflavin and B_2 or Nicotinic acid, Vitamin B_6 or pyridoxin. Folic acid also belongs to this group.

Thiamine, Vitamin B_1 is essential in pregnancy, as a deficiency of it will cause polyneuritis and also because it helps in carbohydrate metabolism. It is used to control the vomiting of pregnancy. *Thiamine* deficiency may cause anorexia, changes in heart's function, loss of muscle tone, insomnia, forgetfulness and irritable temper. It is found in milk, lean meat, vegetables (legumes, potatoes and whole meal bread. The standard requirement is laid down as 1·8 mg. for every 100 calories.

Riboflavin, B_2 is widely distributed in nature, being associated with the yellow pigment in many foods. Its deficiency will lead to a scaly and inflammatory skin condition, around the angles of the mouth and corners of the nose and ears. Glossitis and heartburn are also due to this deficiency. Milk will furnish a large proportion of the riboflavin requirements which have been fixed at 2·5 mg. Deep green vegetables and lean meat are good sources.

Nicotinic acid—Niacin 15 mg. of this component of Vitamin B complex are required daily. It is found in lean meat, liver legumes, potatoes, whole-meal bread. Milk contains very little of nicotinic acid but is a good source of tryptophan, the precursor of niacin.

Pyridoxin has been found useful in the vomiting of pregnancy.

Vitamin C (Ascorbic acid). The requirements of this vitamin are considerably increased during the later months of pregnancy, the average daily requirement being 100 mg. This will be contained in 8 ounces of orange juice ; other foods which contain Vitamin C are tomatoes, grape-fruit, raw cabbage, green leafy vegetables and potatoes steamed or cooked in their skins.

Water.—Water is an essential item in the pregnant woman's daily dietary; it regulates and maintains the water-balance, thereby preventing œdema, and dehydration through negative balance. Atleast 4 to 6 tumblers of water must be drunk by the pregnant woman every day depending upon the season.

Summary.—The necessity for a suitable diet which should include 'throughout pregnancy and lactation, a sufficiency of what are known as protective food stuffs,' is stressed, with particular reference to the several ailments and complications which may occur as a result of the deficiencies in particular food-factors and which may endanger the life of the mother and child. The value of milk in adequate quantities as a most essential item of food during pregnancy and lactation, is emphasised.

RADIOLOGICAL STUDY OF FOETAL-PELVIC RELATION

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Ever since the necessity for antenatal care of pregnant women was realised, the measurements of visualised anatomical parts of pelvis and fœtal head have come to be considered as important in antenatal care. These help to determine the adequacy or otherwise of the maternal pelvis to deliver the head of the fœtus without injury to mother or child. To the obstetrician thorough radiological study of fœtal-pelvic proportions offers a precise knowledge of the size and shape of the pelvis and fœtal head, so that he may formulate the method of conducting the labour. Though clinical examination of the mother gives some information on this point when gross abnormalities are present, adequate information is difficult to have in border-line cases. It is only through a complete radiological examination of the fœtal head and pelvis that the obstetrician can gain first hand knowledge of such cases and of other technical problems connected with delivery. Chasser Moir has written, "there can be no doubt that radiology has proved its value in the field of obstetrics by affording information that may be difficult or even impossible to obtain by any other means."

A proper appreciation of radiological studies of the pelvis in obstetrics and a close co-operation between the radiologist and the obstetrician are essential, as they will ensure safety, obviate unnecessary intervention, and help in deciding when manipulative and operative interference may be indicated.

The controversy relating to the use of roentgen rays during pregnancy as being dangerous to the fœtus, arose from the adverse effects noted in experimental animals in which irradiation during embryonic life resulted in death of the fœtus or in abortion. It has now been proved that irradiation causes damage only at a particular stage of development and *not at all stages* and that fœtal damage is proportionate to the dose of roentgen rays and to the immaturity of the embryo. On the basis of the results obtained in animal experiments, it is believed that irradiation between the second and third weeks of human gestation is likely to produce most marked developmental changes and later exposures result in less obvious changes. Roentgen examination of the expectant mother at or near term carries the least risk to the fœtus ; while the risk is greater in the radiological procedures during the early stages of pregnancy, that may have to be carried out for other reasons, even before conception is suspected by either the patient or the physician.

Any little risk that may attend roentgenological examination of the pelvis may be minimised by taking only the absolutely essential number of skiagrams and by using suitable selective filters.

By a clinical examination of the mother during antenatal care, the obstetrician classifies expectant mothers into three groups:— (1) those with normal pelvis in whom the delivery will be normal; (2) those with contracted or malformed contraction of pelvis involving serious danger to the mother or the foetus; and (3) those whose pelvis show border line disproportion.

The first group needs no radiological examination. The second group also does not need it except as a matter of academic interest. It is mostly the third group of cases that require a radiological study of the pelvis. Even in these border line cases though radiological evidence reveals some minor pelvic foetal disproportions, they may not cause trouble during labour, if the uterine forces are good. But on the other hand the same disproportion with poor uterine forces, may manifest itself in serious dystocia. The information afforded in such cases offers a warning to the obstetrician about the possibility of a difficult labour. A discussion of the clinical problems in the light of the roentgenological findings between the radiologist and the obstetrician will indeed be very useful.

Historical.–Radiological examination of the pelvis dates back to 1897 and numerous methods, some simple and others complex, of pelvic mensuration have been described in literature. Albert in 1897 appreciated the ortho-projection of the pelvic inlet. Fabre and others in France developed in 1900 comparative frame methods. Menges in 1911 applied the geometric principles of Mackenzie-Davidson to study pelvic measurements. In 1915 Runge and Gruenhag used stereoscopic methods and in 1921 Chamberlain and Newell improved on the method.

Thomas, Johnson, Clifford and many other workers since 1922 have done a great deal to improve the radiological methods of examination of pelvis in the stereo-metric field. Rowden, Roberts, and Gage of Great Britain and Thomas, Walten and Jarcho of U.S.A. have done some work on positional methods and tried to reduce false shadows to true size. Guthmann, 1928 was the first to stress the importance of lateral projection for the measurement of sagittal diameter. The qualitative study of pelvic shape was made by Caldwell and Moloy along with Swenson and D'Espo. They have contributed a number of valuable articles on the qualitative characters of the pelvis and the influence of various characters on the adaptation of fœtal head to the pelvis and in the mechanism of labour. They stressed the importance of compensatory capacity in the pelvis where

certain diameters are below normal. Their studies were made predominantly by radiological methods and this led to an increasing, intelligent use of radiological methods for studying fœtal-pelvic relationships.

In recent years Hodges and Ball perfected the 90" triangulation methods of pelvimetry and cephalometry. Ball introduced the practical application of the volume of fœtal head and the volume capacity of the least pelvic planes. In border-line cases Chassar Moir combined the use of precision stereoscope and re-construction of pelvic charts for judgement. Kenney has made use of X-rays during labour.

Suitable time to carry out a radiological examination:—The fœtal pelvic proportions can be measured only after the 34th week, though radiological examination for other purposes can be made earlier. If, during an earlier examination unfavourable capacities of the pelvis are suspected, then a restricted examination between the 37th and 38th weeks to study the foetal-pelvic proportion may be made. After the 34th week of pregnancy, the identification of the tips of ischial spine may be difficult.

A radiological examination of the pelvis should give: (1) precise information regarding the pelvic shape; (2) precise maternal pelvic measurement and fairly accurate information about foetal head measurements; (3) information about pelvic inlet and foetal head relationship; (4) an idea as to the extent to which the foetal head may mould and also; (5) information about the probable mechanism of labour.

An X-ray picture taken during labour will furnish information relating to: (1) the foetal-pelvic relation and proportion; (2) the progress of the mechanism and efficiency of labour; (3) the degree of moulding of the foetal head; and (4) when forceps is indicated.

A proper skiagram will give accurate measurements of the diameters of the pelvis and foetal head and also an idea of the qualitative characters in different planes.

Any standard method of pelvimetry should be simple not involving complex mathematical procedures. An error up to 3 mm. is acceptable as accurate measurement in roentgen pelvimetry. Torpin in 25 operative cases measured obstetrical conjugates and found an error of 1·6 mm. with a maximum error of 3·0 mm. when compared with roentgenological measurements, A difference of 2·0 to 3·0 mm. in pelvic measurements is not likely to result in error of judgement, in view of the fact that many other factors also influence the course of labour. In fact many authors give the pelvic measurements to the nearest centimeter.

Hodges and Dipped classify the methods of pelvimetry into :— (1) position method ; (2) parallax method ; (3) 90° angulation ; and (4) orthometric reproduction.

Another method has recently been described by Isaccs known as the differential divergent distortion method. In all the different methods in use, there is general agreement that the following projections must be taken for obtaining an accurate measurement :— (1) Antero - posterior standing and in cases to be investigated by stereoscopy two pairs of stereograms ; (2) lateral standing ; (3) inlet ; and (4) outlet.

The antero-posterior film is made with the patient standing, without shoes. Skiagram is taken in a suitable-sized film with the ischial tuberosity at the bottom of the film. Target film distance is 100 cm and the rays are centred over the centre of the film. Gravity aids the head coming down further into the pelvis. Lateral film is also taken similarly with the patient standing and taking care to get a true lateral view. Ischial tuberosity is at the lowest part of the film and well super-imposed upon each other. Centering is mid-way between the top of the symphysis pubis and the upper border of the sacrum, which is at the upper border of the greater trochanter. Central rays from the tube pass a little below the centre of the film. Target film distance is 100 cm. For taking a true lateral film a pair of calipers may be used if necessary. Equal distance from the table top of the mid-gluteal fold and from the table top to the mid-labial fold should be maintained.

The inlet film is taken with the patient sitting on the table-top, with the trunk bent backwards and resting on the hands placed behind on the table-top, so that the plane of the inlet is parallel to the film. For the out-let film, the patient is made to sit with the legs widely abducted and bent forwards so that the symphysis pubis is as near as possible to the film. The central ray would pass through the mid-portion of the sacrum posteriorly.

Measurements can be made, by using :—(1) a formula ; (2) direct measurement, by drawing the actual size from superoinferior and lateral views ; (3) a perforated ruler ; or (4) a perforated lead sheet. The easiest method is the application of the formula ; with a pair of calipers and a calibrated ruler measurements are taken from the film image and the following formula is applied :—

Actual pelvic measurement = film diameter measurement × focus symphysis distance ÷ focus film distance.

I. From the antero-posterior erect film the size, position, and any abnormality of the fœtus if present should be determined. Any pelvic deformity and the position of the placenta should be studied in conjunction with the lateral view. In cephalic presentation the fœtal head is usually in the middle line. If there is any

displacement of the fœtal skull the cause should be ascertained *e.g.*, soft tissue tumour, position of placenta etc.

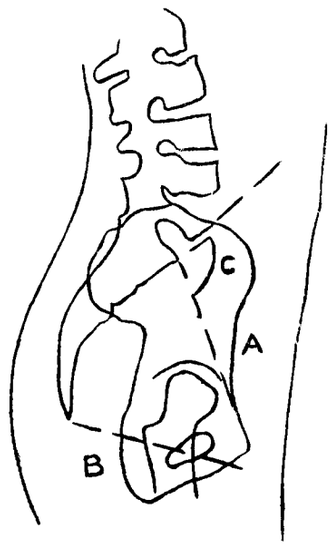

Fig. I. A. Pelvic inlet.
B. Pelvic outlet.
C. Angle of inclination.

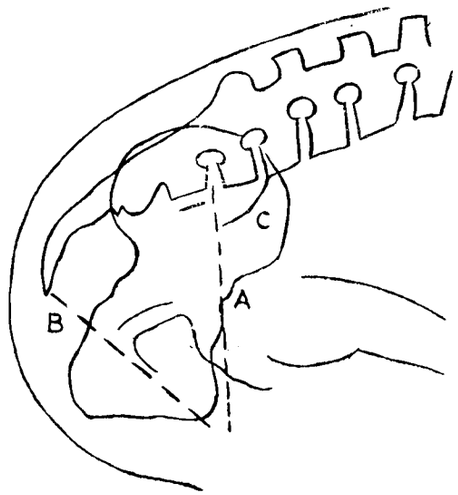

Fig. II.
A. Pelvic inlet.
B. Pelvic outlet.
C. Angle of inclination.

II. In the lateral erect film, the following points should be looked for : *Pelvis* :—1. True conjugate or antero-posterior diameter, which is measured from the mid-portion of the posterior surface of the top of the symphysis pubis to the promontory of the sacrum ; (2) the antero-posterior diameter of the mid-pelvis, which is measured from the posterior aspect of the mid-point of the anterior surface of sacrum ; (3) the posterior sagittal diameter which is measured from the lowest point of the

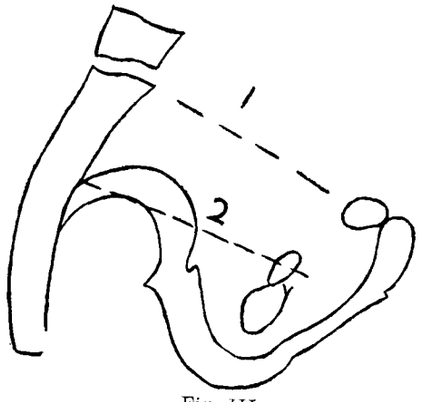

Fig. III
1. True conjugate inlet
2. Mid-pelvis inlet

super-imposed ischial tuberosity to the last segment of the sacrum ; (4) the distance of the ischial spine from the plane of superior strait. By deducting this distance from the distance of superior strait, the distance of spines as shown in inlet film can be determined ; (5) the measurement of the diameter of the fœtal skull which is in profile ; (6) the position of the skull in relation to the symphysis pubis and promontory of the sacrum. In case of a forward or backward displacement a placental segment is usually found ; (7) the shape of

the inner surface of the sacrum *i.e.* whether it is normal, flat, etc.; and (8) in breech presentations the distance of the fœtal skull from the maternal posterior surface.

III. In the inlet film information can be had on (1) the transverse diameter of the inlet, which is the greatest transverse diameter measured just posterior to the true conjugate; (2) oblique diameters of the inlet, which are measured from the sacro-iliac joints to the middle of the opposite superior rami of the pubis. The oblique diameter is designated from the sacro-iliac joint involved; (3) the inter-spinous diameter of the mid-pelvis; (4) fœtal skull when the skull is engaged and lies in the plane of the superior strait both occipito-frontal and biparietal measurements to be made; and (5) undue prominence of sacral-promontory can be seen in this projection.

IV. In the outlet film due to the target film distance being long and to the proximity of the pubic arch to the film, the distortion is likely to be very little and as such measurements can be made directly. In this view the pubic arch is seen in its entirety with its true relationship. A line is drawn connecting the extremes of the ischial promontories and another line parallel to this and one centimeter nearer to the symphysis pubis. The latter line which shall be referred to as A B represents the inter-tuberous distance. From the middle of A B, a line is drawn to the lower margin of the symphysis pubis. This represents the anterior sagittal measurement of the outlet. At the mid-point of the anterior sagittal distance another line C D is drawn parallel to AB. The shape of the arch is determined by the percentage of C D to A B. In the normal curved arch C D would be 70 per cent of A B and in a straight sided arch it would be 50 per cent AB. Supra-pubic angle is represented by lines drawn from the lower margin of the symphysis pubis to the inner margins of both ischial tuberosities. The average angle in a normal arch is 83°.

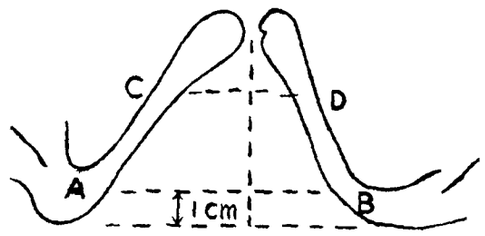

Fig. IV

The disproportion or otherwise of the fœtal skull to the maternal pelvis can be assessed satisfactorily by comparing the volume of the fœtal skull and the volume capacity of the smallest internal pelvic diameter. The fœtal skull can be measured fairly accurately by tracing the perimeter of the image on the film by a map measure and then correcting for its magnification. As the skull is not a true sphere the measurements should be made in two planes which are at right angles to each other. Measurements taken both in antero-posterior and lateral views satisfy the requirements and the mean average of the two corrected measurements will be adequate to find

the volume. The volume of the soft tissue, scalp, should be added to the figure obtained. This is usually taken as $\frac{1}{5}$ of the total volume and has been found by experiments by immersing the fœtal skull of full term infants before and after the reflection of the skull. This figure tallies with that found by mathematical calculation. The average thickness of the new born fœtal scalp works out at 19 mm. or approximately 2 cm. in the circumference measurement. Thus the total volume of the fœtal cranium including the scalp is the volume of a sphere, the perimeter of which is the mean corrected measurement in antero-posterior and lateral views. The volume is read off from a ready-made table, and is compared with the maternal pelvic volume taken at its smallest internal diameter. The true conjugate or bi-ischial diameter is usually equal in all pelvis or if one is smaller, this may be used for volumetric comparison. A fœtal skull with a larger volume than the volume capacity of one of these diameters of the pelvis may pass through without much difficulty, because of the compensatory space at the same level of the pelvis and of the optimal adaptation. In the absence of either of these two, the moulding of the fœtal head may be of such a degree as to cause serious consequences. There are charts showing the volume of a sphere based on diameter and circumference measurements from which the size of a mass in units of volume can be ascertained from the linear dimension.

Stereometric pelvimetry.—This has certain advantages over the single film technique. Here a right projection of the object in the films is produced with the dimensions made calculable.

(1) The shape of the pelvic inlet is seen more satisfactorily; (2) the shape and size of the sub-pubic arch are seen better and they aid in classification; (3) the mid and lower pelvis are well brought out with thin curvature and inclinations; (4) the lie and the attitude of the fœtus and other factors relating to the fœtal pelvic proportions are more clearly delineated. Measurements made from a three-dimensional image can be used to assess disproportion between the fœtal head and the pelvic outlet. When stereograms are reviewed with an ordinary stereoscope there may be some variation in the size and shape of the image if there is a tilt in the optical system or a change in the angle between the two mirrors. This does not however, occur when a precision stereoscope is used, as it gives a true optical view in regard to the size and shape of the image.

Currey has described a simple method of roentgen pelvimetry which is known as the "constant divergent distortion method." It is sufficienty accurate, any little error being within permissible limits. Roentgenograms are taken at a target film distance of five feet. Measurements may be taken directly from the wet film.

Several methods have been described by different authors for assessing the obstetric prognosis from a radiological study of the pelvis. Allen has made a table of useful data for prognosis based upon measurement of selected pelvic dimensions and capacities. Weinberg and Scadron have also framed a table from inlet pelvimetry. These tables will be useful guides in prognosis. Prognosis is good if the inlet area is more than 111 sq. cm ; fair if the area is between 94-111 sq. cm. ; guarded if the area is between 77-94 sq. cm. and poor if below 77 sq. cm.

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INDICATIONS FOR HYSTERECTOMY

Charles B. Marck, M.D., of Baltimore says :—"Unnecessary pelvic operations can be avoided if the physician is thoroughly familiar with the indications for hysterectomy and makes a critical evalution of each patient."

The indications for operation fall into 4 categories : *viz.*, (*1*) *Absolute Indications* :—Benign lesions which require operation include adenomyosis ; tubal, endometrial, or cervical tuberculosis : and uterine fibromyoma with severe uterine bleeding, necrosis, torsion, pelvic pressure symptoms, and pain. For young patients and those desiring pregnancy, myomectomy is the recommended procedure whenever possible. Diagnostic curettage is always performed to detect a possible co-existing malignant lesion.

Carcinoma of the ovaries, tubes, and uterus and metastatic extension from other pelvic organs require hysterectomy. With malignant lesions of the ovaries and tubes, hysterectomy is included in the operative procedure, because lymphatic channels from the involved areas extend through the uterine lymphatic system.

Obstetric conditions for which hysterectomy is required are choriepethelioma of the uterus and adnexa, placenta accreta with placental invasion of the myometrium, and cervical tears with hæmatoma of the broad ligament.

(2) *Relative indications* :—Fibroids which cause no abnormal symptoms may be observed by periodic examinations, but hysterectomy is advisable if total size exceeds that of a three-to four-month pregnancy. Endometriosis in a patient of child-bearing age should be treated conservatively, but oophorectomy and hysterectomy may be performed in women near the menopause. When bilateral oophorectomy is done, the uterus is also removed to avoid future malposition and tumour. Third-degree uterine prolapse, particularly in elderly patients is best managed by hysterectomy.

(3) *Borderline indications* :—Conditions in this group include questionable carcinoma *in situ*, functional uterine bleeding, fibrosis uteri, squamos-cell carcinoma, uterine polyp and endometrial fibroids with broad bases. Uncontrollable uterine bleeding in patients with blood dyscrasias or endocrine dysfunction may necessitate hysterectomy.

(4) *Questionable indications* :—Varicose veins of the broad ligament, severe dysmenorrhœa, endocervicitis, idiopathic pelvic pain, cystocele, rectocele, and ectopic pregnancy are questionable reasons for hysterectomy. Patients usually may be treated medically or with gynæcologic surgical procedures other than hysterectomy.—(*Mod. Med.* 15—9—1954).

ASPHYXIA OF THE NEWBORN

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A MOTHER is delivered, a baby is born, but it does not cry lustily as babies must ; on the contrary it does not evenbrea the, giving an anxious time to all concerned ; sometimes the baby ultimately dies, casting a gloom over the whole atmosphere which must be filled instead with joy at the advent of a live and healthy baby. This has occurred in all countries and taken a heavy toll of newborn babies, as a result of asphyxia neonatorum. Though the maternal mortality and the hazards of childbirth have been brought down very considerably in all countries so far as the mother is concerned, the extent of fœtal wastage through stillbirths and neonatal deaths, even on the first day, continue to be very heavy. Thus, the United States Bureau of Census reported a decline of infant mortality from 100 per 1,000 live births in 1915 to 40 per 1,000 in 1942 but the neonatal mortality on the first day of life accounted for 29% of the total first year mortality. Bundesen reports that actually, over one-third (35·6%) of all infant deaths in Chicago occurred on the critical first day, during 1952. Moreover, of the infant deaths during the first day of life, 54·3% were caused by abnormal pulmonary ventilation alone. Asphyxia of the newborn has therefore, been engaging the earnest attention of all concerned during recent years.

The failure to initiate the anticipated respiratory movements is often due to a depression of the respiratory centre caused by intrauterine anoxia, hypnotic and narcotic drugs used on the mother, raised intracranial pressure during birth and also to prematurity with consequent inefficiency (and insufficiency) of the respiratory organs. Asphyxia neonatorum may be expected, in cases of fœtal distress, difficult and prolonged labour and where sedatives or anæsthetics have been used on the mother. The incidence of deficient oxygen supply, resulting in fœtal anoxia, fœtal distress and asphyxia after birth is likely to be increased by cardiac disease and failure, anæmia, pulmonary disease, infections, genitourinary and gastro-intestinal diseases, metabolic diseases and toxæmias of pregnancy in the mother. Taylor and his co-workers (1951) have drawn attention to the fact that serious fœtal anoxia is caused by the maternal blood-pressure falling below 80 mm. of mercury and remaining there for five minutes or longer, and also by the duration of anæsthesia longer than 10 to 12 minutes. Placenta prævia may often cause such a disturbance, in which case the possibility of fœtal

anoxia should be considered in attempting treatment, by the vaginal or even by the abdominal route.

After birth, the baby may fail to breathe properly through failure of central stimulation or regulation of breathing, low oxygen tension in the inspired air, pulmonary disturbances like obstructed air-way, atelectasis, pneumonia, pulmonary œdema or emphysema and unærated right-to-left shunts through or around the heart. Asphyxia of the newborn baby often occurs as a result of aspiration, into the respiratory passages, of liquor amnii, meconium and such other swallowed contents of the stomach which have subsequently been regurgitated. As mentioned by Gellis *et al* (1949), these phenomena are particularly likely to occur in premature babies and after cæsarean section. Little *et al* (1951) call it "delayed respiratory distress" and also draw pointed attention to many neonatal deaths due to this cause. They have moreover observed that the incidence of asphyxia neonatorum greatly increases in babies of mothers aged 40 years or over; parity *per se* is perhaps also a factor, for primiparous mothers have asphyxiated babies more often than multiparae. It has been observed by many workers that a delay or prolongation of labour for more than 24 (or specially 30) hours is very likely to cause the baby to be born asphyxiated. Sedatives and anæsthetics administered to relieve the mother in labour, have come in for serious criticism because of their tendency to produce fœtal asphyxia. Many observers, *e g.*, Cumpston (1954), rightly have observed that "owing to the mere fact of the obstetrician's wanting to help the mother, he may irrevocably, harm the child" by administering analgesic or anæsthetic drugs to the mother, which produce intranatal or neonatal asphyxia in the fœtus due to poor quality or excessive dosage of the drug. Lee (1950) states that morphine as well as pethidine, used to relieve the mother, are partly responsible for the birth of babies which are "sleepy" or refractory to stimuli in the matter of early respiration and crying, and that pethidine is responsible for at least 10 per cent of new-born babies some of which need resuscitation. He therefore, advises against the use of pethidine within 3 hours of actual birth of the baby. Apgar and Papper (1952) state that all anæsthetic gases and vapours, as also morphine, pethidine and barbiturates can cross the placental barrier. But this assertive view is not shared by all; *e.g.*, De Weerdt and Schockaert (1952) found that curare does not cross the placental barrier, and hence not contra-indicated in cæsarean sections where the babies are often found rather slow and sluggish in starting regular respiration. Guilhem (1953) and his co-workers studied in 306 cases the effects on newborn infants of the use of pethidine as an obstetric analgesic, by estimating the drug level in the cord blood spectrophotometrically; they correlated it to the time when pethidine was injected into the mother, and found that pethidine did not compromise fœtal oxygenation. This accords

with the general opinion of obstetricians mainly based on clinical observations. Further work on this is desirable, particularly because of the extensive use at the present day of pethidine for the relief of pain during labour.

As stated before, asphyxia neonatorum is often preceded by, and may be anticipated to occur in cases of fœtal distress. Soldenhoff and Brill (1954) reported that fœtal distress is signified by the following clinical features: (*a*) a progressive drop of the fœtal heart-rate to 100 or less per minute, (*b*) a progressive rise of the fœtal heart rate to 160 or more, and sustained for two hours, or the recurrence of the rate of 160 more than twice; (*c*) irregularity of the fœtal heart in rhythm; (*d*) muffling of the fœtal heart; (*e*) tumultuous fœtal movements, and (*f*) the passage of meconium. The researches of Barcroft and of other workers, have enabled us to know a great deal about the normal and abnormal conditions found in the fœtus and the neonatal child. It is well-known that fœtal bradycardia is a sign of fœtal distress, and that when it is followed by an excessively fast heart-beat, the fœtus has been, and continues to be in extreme distress. Perhaps the sympathetic nervous system responds by causing a flow of adrenaline into the blood stream. A baby born with severe asphyxia neonatorum is really in a condition of shock. Govan (1949) pointed out that many infants dying of asphyxia pallida present, on postmortem examination, characteristic changes of shock. On the realisation that asphyxia neonatorum very often follows fœtal distress due to a deficient supply of oxygen to the intrauterine fœtus, attempts have long been made to determine the status of oxygenation of the fœtus while still inside the uterus. Blair-Bell and his colleagues in Liverpool (1928) were perhaps the first to study the recorded readings of the oxygen content of blood in the umbilical vessels of the human fœtus. It has now been realised that oxygen is a rather unique substance so far as the requirements of the fœtus are concerned; for, it cannot be stored in the tissues, so the supply must be ample and continuous. Ingalls *et al* (1950) found that a moderate deficiency of oxygen, for a short while may injure the fœtus seriously. Near term, the human fœtus can survive a total lack of oxygen for a period of 30 minutes provided the circulation is in tact and lesser degrees of anoxia for longer periods. Eastman, compares the oxygen environment of the fœtus *in utero* with that of the atmosphere about three-fourths of a mile above the summit of Mount Everest. He says that at 33,000 feet, the partial pressure of oxygen is only 40 mm. of Hg.,—low enough to kill a husky man in a few minutes. The fœtus however, continues to thrive in such a low oxygen tension by an increase in its amount of hæmoglobin and also by an increase of its bone-marrow activity. The fœtal hæmoglobin is said to be of a special kind which parts with its oxygen very readily, and hence the fœtus is very likely to die

quickly for want of oxygen (anoxia). Walker and Turnbull (1953) have made extensive studies in the hæmoglobin and the red blood cells in the human fœtus and their relation to the oxygen content of the cord blood. They concluded that fœtal distress is uncommon in normal pregnancy except under abnormal circumstances like maternal anoxia, prolapse of the cord etc. when the fœtus shows distress, and during labour, particularly when it has probably suffered from a degree of oxygen-deficiency for some time before the onset of labour. In his Blair-Bell memorial lecture, Walker (1954) observed that the oxygen supply to the human fœtus, in a clinically normal pregnancy, falls gradually up to the 40th week, and rapidly thereafter. Most fœtuses at the 40th week are well oxygenated and have nearly 100% reserve, but in some the oxygen supply is low and the reserve is correspondingly reduced. Walker found the oxygen supply to become steadily poorer after the 40th week. He also found that the well-oxygenated baby can stand the effects of labour of any kind without becoming short of oxygen; but that a fœtus with an already deficient supply, is likely to experience deficiency of oxygen during labour and to declare this deficiency by passing meconium. When meconium is passed, the oxygen saturation of the blood in the umbilical vein is at or below 30 per cent, and the fœtus is not then obtaining enough oxygen to survive indefinitely. Walker also found that death from anoxia in association with difficult labour is extremely uncommon until after term, and that 83 per cent of all such deaths occur after the end of the 41st week. Moreover, a study of the fœtal distress rates showed that in the young woman, oxygen supply to the fœtus does not deteriorate quickly, suggesting that, the uterine blood flow is very efficient in them and that there is considerable reserve.

Attention has in recent years been focused on another condition, a hyaline-like pulmonary membrane, which is increasingly detected on postmortem-examination, especially in premature babies dying of asphyxia neonatorum. This is a hyaline-like, homogeneous, membranous structure, staining pink to red with hæmotoxylin-eosin dye which can be seen lining the alveoli, alveolar ducts and bronchioles. Former workers considered that the aspiration of the amniotic-sac contents, chiefly vernix caseosa was its cause, some others even suggested that the hyaline-like membrane may be the primary cause of death in some newborn infants. Later researches have however, thrown doubts on this explanation relating to the causation of the membrane. Bruns and Shields (1951, 1954) found such a hyaline-like membrane in 114 out of 703 infants studied *post-mortem* (439 neonatal deaths and 264 still births). After a careful analysis of the material and available literature, they believe that pulmonary capillary endothelial damage, due to fœtal anoxia during premature labour may be the

first step and that subsequent high concentration oxygen therapy (over 70 per cent) may well be another factor in the causation of such hyaline-like membrane and subsequent death from asphyxia. Claireaux (1953) found 108 hyaline membranes in the post-mortem examination of 810 infant-neonatal deaths of which 66 per cent died on the first day. He considers the primary factor to be the massive aspiration of liquor amnii *in utero*. The fluid is largely absorbed into the pulmonary circulation while the deposits left over, the squames clumping together and losing their cellular identity form a membrane lining the air spaces. This eventually covers the walls of the alveolar ducts resulting in death from suffocation.

The management and rational treatment of asphyxia of the newborn has been a serious problem ever since it was recognised as a distinct clinical, pathological entity. The clearing of the respiratory passages by the good old mucus sucker has always been felt as a first necessity. Stimulation of the skin surface by hot and cold applications were practised for ages but later on largely discarded as likely to do more harm than good to the years. Warmth and CO_2 inhalation along with lobeline injectionbaby. been the usual practice for severe cases during recent have Oxygen is given by inhalation after the respiration starts. Yilpo (1935) was the first to suggest that in such cases, the deficiency of oxygen can be partially made good by absorption from the gastro-intestinal tract. In 1950 Akerren and Furstenbery described a technique for administering oxygen into the stomach for absorption from there, with a view to combating the anoxia O'Brien and Roberts (1952) recommend oxygen to be administered with intermittent positive pressure, by means of an endotracheal tube. They consider this method to be safe, simple, quick and effective in severe cases of asphyxia neonatorum. Theodorides and his co-workers (1952) advocate the inhalation of ozone (in a special apparatus) by the mother during labour, in the presence of fœtal distress. They report that the fœtal heart-beats return to normal after only 5 to 10 inspirations. Waller and Morris (1953) report successful results in 41 out of 48 infants, using Akerren's method of intragastric oxygen. They found that breathing started in 1 to 75 minutes in the asphyxiated babies. Toaff and Eckerling (1954) report very satisfactory results with the administration of oxygen. after clearing the air-passages by aspiration with a tracheal catheter and placing the baby in a warm cot. They gently pass two Nelaton No. 10 catheters into the stomach, and then run in a stream of 2 to 3 litres of oxygen per minute through one of them. The stomach and intestines become distended. The outflow of oxygen through the second catheter is controlled by immersion of its upper end in water. Poivedrin (1954) advocates the oxygen to flow in at the rate of 4 litres per minute with an atmosphere, not in excess of 60 per cent of oxygen. Lord, Powell and

Roberts (1953) have also used intragastric oxygen with very good results, along with early aspiration and endotracheal insufflation. Based on Barcrofts theoretical and practical observations, Akerren (1954) devised a simple method which directs a powerful stream (not just a trickle) of oxygen to the upper lip region of the trigeminal nerve with the help of a narrow rubber tube which lies firmly within the shaft of a funnel which acts as a sort of a mask. This exerts a stimulating effect on the respiratory centre while increasing the oxygen content of the inspired air at the same time.

The aspiration of the gastric contents, and clearing and draining of the upper respiratory tract of inhaled liquor amnii, vernix etc. have long been practised. Various mechanical devices have also been recommended and used at different times in the management of asphyxiated babies. Gibberd and Blaikley (1935) advised the administration of oxygen intermittently with a positive pressure of 2.5 cm. of water, and devised an "inclined plane" to ensure a clear air-way. Eve's (1948) rocking method of artificial respiration or the mechanical rocker, of Roberts-Talley type disturbs the child very little, and hence, is likely to encourage and improve the infant's circulation by increasing the venous return to the heart. Fletcher and Rogers (1951) devised a combined "respirator-aspirator" for continuous supply of oxygen, with controlled suction, on the principle of an oxygen-powered atomiser. Cussack and Cussen (1954) use a simple rocking plane which is tilted at 45° alternately in "head-down" and "head-up" positions, for 4 seconds in each. Simultaneously, the lungs are inflated with oxygen at intervals of every half minute. Bloxsom (1951) devised a positive pressure oxygen air-lock apparatus with the object of producing moist heat while administering oxygen for peripheral absorption through the skin and the upper respiratory tract, as also to effect gentle chest respiratory exercises. Zelenik and Prystowsky (1952) found Bloxsom's apparatus to be a most valuable adjunct in the treatment of asphyxiated babies. But Apgar and Kreiselman (1953) reported unsuccessful results with this apparatus in their experimental animals (dogs). On the other hand, with the continued use of their positive pressure air-lock apparatus, Bloxsom and Angelique (1954) report a reduction of 41 per cent in 48 hour neonatal deaths—effecting a salvage of 26 infants from the previous loss of 63 term infants (per 10,000 deliveries).

Many drugs have been used at different times to help resuscitate an asphyxial newborn baby, Coramine was used for many years, replaced later by α-lobeline. For many years Leak (1953) has used a preparation of leptazol by the intravenous or intramuscular route. But many would hesitate to use this drug, which is known to be a convulsant. Abel, Ball and Harris (1951) reported satisfactory results with nikethamide and α-N-methylamphetamine

(methedrine) which act as respiratory stimulants and also help to raise the blood-pressure. Cussack and Cussen (1954) rely on the intramuscular injection to the mother just before delivery, of 20 mg. of amphetamine and 4 cc. of nikethamide. In 1941 McCawley, Hart and Marsh first prepared a drug N-allyl-normorphine, which was found to antagonise respiratory depression due to morphine in experimental animals. Eckenhoff *et al* (1952, 1953) have found this drug very effective in the prevention of neonatal asphyxia. An injection of 10 mg. should be given to mothers who have been given opiates, about 10 minutes before labour. Alternatively, the drug may be given intramuscularly or intravenously to the baby after its birth. Chalmers and Thornberry (1954) report dramatic results in 7 out of 8 cases of neonatal asphyxia due to the effects of morphine or pethidine. While recognising that the use of this drug nalorphine should permit the increased use or morphine and such other drugs during labour, Paterson and Prescott (1954) have done well in drawing attention to the fact that not all cases of neonatal asphyxia are due to maternal sedation.

While discussing the problems of asphyxia of the newborn, we should remember the possible sequelæ to be met with in babies who were born asphyxiated but were ultimately resuscitated Many observers have hinted about residual intracranial lesions in such babies. Keith and Norval (1950) found that prolonged labour increased the risk of cerebral injury, asphyxia and neonatal death but that this had little effect on the subsequent development of the baby. From his studies Courville (1952) suggests that cerebral anoxia is the aetiologic factor in many of the so-called degenerative diseases. Proved lesions of anoxia include focal cortical necrosis and scarring, widespread diffuse and nodular atrophy of the cerebral cortex, focal and diffuse alterations of corpus striatum, areas of cortical and subcortical softening incident to arterial occlusion, demyelination of the centrum and central cyst farmation. Deaver (1952) in his extensive review of the subject also mentions cerebral palsy as likely to follow neonatal asphyxia.

Besides the possibilities of neonatal death, an asphyxiated baby runs the risks of suffering from crippling disabilities throughout life even if it survives, as a result of the greatly improved modern methods of management. It is hence necessary that every effort should be made to prevent asphyxia of the newborn which is known to follow maternal anoxia and foetal distress, difficult and prolonged labours, and repeated or generous use of sedatives and anæsthetics. Primi-gravidous women of 25 years or under, with an otherwise normal pregnancy should be watched, if the pregnancy extends beyond 40 weeks. Usually they may be allowed one or two weeks for spontaneous labour to start. If, the maternal weight is however, found to fall steadily (after 40 weeks) while the liquor amnii appears to be lessening, or if pre-eclampsia develops, labour should be induced at

once as otherwise the baby may seriously suffer from placental insufficiency and consequent anoxia. The foetal heart sounds (rate, rhythm and tone) should be regularly recorded in the labour chart throughout labour. Prolongation of labour beyond 24 to 30 hours should as far as possible be avoided. At the earliest signs of fœtal distress during labour, a complete examination will rule out malpositions or prolapse of the cord and a liberal supply of oxygen should be given to the mother and appropriate steps taken for terminating the labour, *e.g.*—cæsarean section, forceps etc. The practice of rupturing the membranes as a pre-operative step before cæsarean section is said to minimise the chances of aspiration of liquor amnii and consequent pulmonary complications. Moreover the analeptics, discussed above, may be given to the mother before delivery, to make the infant more responsive to stimuli after birth. When the baby is born asphyxiated, the management depends upon the principles that the air-way must be clear, oxygen must be brought to the blood stream and the oxygenated blood must be made to reach the brain. In this connection it is important to bear in mind that suspension of the newborn by its feet to promote drainage of the respiratory tract may perhaps aggravate the tendency to cerebral hæmorrhage; a tilt of about 15° to 30° Trendelenburg appears to be optimal.

The proper management and effective prevention of asphyxia neonatorum will result in lowering the incidence of neonatal mortality in India, and the concerted efforts of all obstetricians should be detected towards achieving this goal.

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THE ROLE OF ANALGESIA AND ANÆSTHESIA IN FŒTAL SALVAGE

All anæsthetic drugs or agents given to a patient in labour, whether administered by inhalation or by oral or parenteral routes, have a depressing effect on the fœtus. The effect may be great or small depending on the dosage, the agent, and the time of administration in relation to delivery. The fœtus exists in the uterus in an oxygen atmosphere of approximately 50%. If the newborn infant is a full-term, normal child, and is born without undue trauma or drug depression, there will be rapid upward adjustment of its blood oxygen saturation to normal adult levels. This adjustment to 95% and 96% oxygen saturation of the blood will occur within 15 minutes after delivery, if no general anæsthesia or analgesia is used and if the child is born from a normal spontaneous delivery at term. This does not mean that general anæsthetic and analgesic agents should not be used in obstetrics. It means that there is some risk involved and that the anæsthetic should be properly chosen, timed, and administered so as to balance the added risk.

It is the feeling of most physicians that since cyclopropane is administered with a large percentage of oxygen it is a relatively safe anæsthetic agent in obstetrics. Chicago's experience and my own experimental work (at the University School of Medicine and Hospital at Colorado) is contrary to this belief.

The normal obstetric patient delivered by a good obstetrician can take almost any of the anæsthetic and analgesic agents in reasonable amounts, by which is meant no more than 10 to 12 minutes of terminal general anæsthesia before termination of the second stage of labour; the anæsthetic agents add their adverse effect however to the already present action of analgesic drugs. Analgesia without anæsthesia or anæsthesia without analgesia is much safer than a combination of the two. When a delivery is complicated by major operative obstetrics or major complications of pregnancy, the dangers of anæsthesia and analgesia are multiplied many times.

Our clinic's present most popular method for pain-relief in labour is the use of meperidine (Demerol) hydrochloride, 100 mg., and scopolamine, 0·4 mg., combined with the inhalation of trichlorethylene for analgesia. When the patient is definitely in labour a preliminary dose of meperidine hydrochloride and scopolamine is administered intramuscularly. If the patient is uncomfortable this may be repeated in two to three hours. We have found the administration of 0·86% to 1% trichlorethylene, by a patient, to be a satisfactory form of analgesia for the uncomfortable period of the first stage of labour and for the second stage of labour. The delivery phase and episiotomy are performed after the administration of pudendal block anæsthesia with 1% procaine solution. Trichlorethylene is such a volatile agent that it has very little opportunity to depress the child. We have found that the oxygen saturation of the infant's blood has not been affected by trichlorethylene analgesia self-administered by the mother during the later stages of labour.

The careful administration of ether, cyclopropane, nitrous oxide, or thiopental (Pentothal) sodium for periods no longer than 10 to 12 minutes at the termination of the second stage of labour leads to no serious difference in average oxygen saturation of the infant's blood at birth or at one hour when compared to that of infants born after pudendal or saddle-block anæsthesia.

Since maternal general anæsthesia, given for relatively short periods at the termination of the second stage of labour, tends to prevent the early attainment of normal blood oxygen saturation levels in a significant proportion of newborn infants, prolonged general anæsthesia for delivery should be avoided. Some form of regional anæsthesia should be used for deliveries that are complicated by prematurity, placenta prævia obstetric trauma, placental separation, toxæmia of pregnancy, or compression of the umbilical cord, since infants delivered under such difficulties are already candidates for anoxia.

Over the past eight years 96% of the cæsarean sections have been performed with the patient under spinal anæsthesia or under local anæsthesia followed by thiopental sodium or cyclopropane after delivery of the child. While there have been many advances in medicine to account for the improved fœtal mortality rates associated with cæsarean section, we believe that the use of local or regional anæsthesia instead of general anæsthesia has been of first importance.

It is fundamental that barbiturates, morphine, morphine-like products, and meperidine hydrochloride be withheld from the patient previous to cæsarean section. When general anæsthesia was used for cæsaren section it was not uncommon for the mother to receive 15 to 20 minutes of general anæsthesia before delivery of the child. The stupor and anoxia of the child born from caesaren section done with the mother under general anæsthesia can easily be accounted for and can just as easily be avoided. Local or regional anæsthesia is especially indicated when the cæsarean section is done for hæmorrhagic conditions of pregnancy toxæmia, or prolapse of the cord.—(Taylor E.S., *J. Am. Med. Assoc.*, *156* : 16., 18-12-54)

ASPHYXIA NEONATORUM

In domiciliary practice and where there is no supply of oxygen, recourse may be had to the old fashioned mouth-to-mouth breathing in which the infant receives from the exhaled breath of the operator an atmosphere that is, although depleted, richer in oxygen than the atmosphere in its own trachea and stomach. A protective piece of gauze or muslin should be placed between the infant's mouth and that of the operator.—(Dr. Shila, G. Ransom in *Guide to Obst. in Gen. Pract.*, 1954).

A sharp tongue is the only edged tool that gets sharper with constant use.
—Washington Irving.

PAINLESS LABOUR

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Progress in the use of anæsthetics and analgesics for the relief of pain has been slow and halting especially in obstetrics. The first real advance was made, when nitrous oxide and air were given in the Minnitt machine. In the early 1940's pethidine, caudal anæsthesia and trilene were introduced which marked a further step in advance. But the ideal obstetric anæsthetic is still to be found.

In recent years, pain during labour is considered an artificial product of culture and civilization. Grantly Dick Read's hypothesis is that labour pains are due to fear. Without entering into this controversy, let me proceed on the assumption that most women require a pharmacologic analgesic or anæsthetic towards the end of labour. The intensity of pain increases as labour progresses, reaching its maximum during the second stage.

Many factors modify the painful experience. Fear, tension and anxiety intensify pain-perception even in the presence of skin infiltration over the areas of referred hyperalgesia. Under the influence of fear, labour is agonising, as the strong irresistible emotion-fear, disrupts neuro-muscular harmony. By the avoidance of suggestions of fear and by proper education, complete relaxation as suggested by Grantly Dick Read can be achieved for the control of emotions, and the tension in the mind and over the cervix is easily relaxed.

No particular method is known to provide complete pain-relief, during labour, in all patients. The modern tendency is therefore to evaluate carefully each patient anæsthetically as well as obstetrically.

Preanaesthetics (selected by me for study).—Early in the first stage of labour chloral hydrate and bromide (30 gr. of each) were given. In the long and dreary first stage pethidine was the drug of choice for relief of pain. This was given even to patients in my control series.

I applied the regional anæsthetic procedure during the later part of the second stage of labour in obstetrical patients under the name 'Saddle-block anæsthesia' which gave very satisfactory results in 106 selected cases, and I compared it with the results obtained in a control series of 100 cases, which were also given preanæsthetic drugs.

Saddle-block anaesthesia.—*Material studied* :—Heavy nupercaine (saddle-block anæsthesia was used in 106 selected cases delivered in my Nursing Home.

Technique :—A small volume of 0·5 cc. heavy solution of Nupercaine is injected into the subarachnoid space, without previous removal of cerebrospinal fluid and without previous admixture with cerebrospinal fluid. The movement of the heavy solution within the subarachnoid space is governed by gravity and the inclination of the spine. Thus if the patient is sitting up the heavy solution sinks to the lowest part of the thecal sac, affecting the sacral roots only.

Solution :—Heavy nupercaine (hyperbaric) 1 : 200 in 6% glucose, with a specific gravity of 1·024 (15·5 c.) 1·023 (37·0 c.); (Note : heavier than C.S.F. Sp. Gr. 1·004–1 007).

Instruments :—Two 2 cc. syringes accurately gauged, made of neutral glass, one for nupercaine solution and the other for vaso-pressor (ephedrine); lumbar puncture needles 3–3½" 20–22 S.W.G. (0·9-0·7 mm.); Short bevel with stylet of rustless steel; heavy nupercaine 3 cc. ampoule ; ephedrine 1 ampoule of 0·02 gr. Filling needle. Serum needle for vaso-pressor. All these must be sterilised, by boiling for five minutes in double distilled water. Tap water must *not* be used as nupercaine may be precipitated in an alkaline medium.

Premedication :—An injection of atropine gr. 1/100 is given hypodermically, one hour before operation ; and the vaso-pressor ephedrine (0·04 g.) is given intramuscularly just before the lumbar puncture.

Perineal ("saddle") anæsthesia (S.I. downwards). Lumbar puncture with the patient sitting up between L. 3·4; 0·5 cc. heavy nupercaine is injected slowly. The patient is maintained in the sitting position for 3 to 5 minutes. A block from S.I. downwards is obtained.

Note.—The legs are not anæsthetised with the exception of the soles of the feet and the nursing staff should be warned to avoid hot bottle burns.

Results.—The success of the therapy was assessed solely on the extent of subjective relief obtained by the mother.

Subjective relief:—Ninety-nine cases had complete subjective relief of pain. Five cases had incomplete relief and two had no relief; after repeated attempts blood stained fluid came out, so the injection could not be given. No supplementary anæsthesia was given to any of these cases, except to two in whom internal version had to be done and complete relaxation was therefore, absolutely necessary. Thus it was used to provide deeper anæsthesia for the operative procedure.

Duration:—The duration of the subjective relief varied from 2 to 3 hours. 94 cases delivered within 2 hours. 8 cases delivered after 2½ hours, and only 4 cases at the end of 3 hours. The episiotomies could be sutured in some cases even later without any pain. The episiotomies or tears were sutured in 27 cases.

Type of delivery :—68 were spontaneous deliveries, 18 were delivered after forceps application in which 12 were right-occipito-posterior, 18 cases were breech presentations, which were assisted or extracted and in two cases internal version was done to deliver the child. Forceps were applied in 18 cases. Some more spontaneous deliveries could have been effected by waiting for a longer time and educating the patient to bear down at the time of the uterine contractions. In some cases it was prophylactic outlet forceps. Twelve cases were of right-occipito-posterior and with low forceps easy delivery could take place. In the control series 14 were forceps deliveries, and four only were delivered by breech.

Parity :—Out of these 106 cases, 28 were primiparæ, 12 were second para, 13 were third, twelve were fourth, nine were fifth, eleven were sixth, six were seventh, five were eighth, four were ninth, three were tenth, one was eleventh, and two were of twelfth para respectively. (*Vide Table, pages 288 and 289*).

Morbidity or complications.—*Third stage of labour* :—There is no evidence for prolongation of the third stage of labour. Only 3 cases were noted where the placenta was retained for 20 minutes. In one case it was retained for 30 minutes, and in another the placenta was removed manually to stop excessive bleeding. Duration of the third stage is charted below and compared with the control series. Not a single case under observation ended fatally; nausea and vomiting were not disturbing factors in any of the patients.

Catheterisation :—Is not counted for the first 24 hours after delivery. Eight patients had to be catheterised for 2 days, one was catheterised for 6 days. Early ambulation markedly diminished the rate of catheterisation. 24 hours after delivery patients were allowed to go to the bathroom.

Puerperal infection or urinary tract infection was not noted in these cases. Six cases of mastitis occurred. Two cases of non-healing of episiotomy wounds were noted. 16 cases showed a rise of temperature out of which only two showed 101° to 102° F. for 3 days, (due to mastitis). In other cases it was between 99° to 99·5° F which lasted only for forty eight hours or less.

Headache was noticed in 16 cases, of which only five cases had it for more than three days. Tight abdominal binders gave good relief. In one case headache continued for five days. Dull ache in the back of the neck extending to the occipital region was the usual complaint. In more severe cases the frontal area was involved. The headache disappeared when the patient lay flat on the bed. In the control series 8 patients complained of headache.

No permanent *neurological complications* were noticed. Neuritic signs were noticed in five patients. Six patients complained of tingling and numbness. One patient had sciatic distribution of pain in both the lower limbs which was relieved after three weeks. All other patients were relieved during their stay of 10 days. In the control series, backache was observed in 12 cases.

Record of 106 Cases which had Saddle-Block Anaesthesia Compared with a Control Group of 100 Cases*

I. Parity

Para	Number given anaesthesia	Number of control cases
I	28	5
II	12	4
III	13	18
IV	12	20
V	9	3
VI	11	22
VII	6	16
VIII	5	6
IX	4	3
X	3	3
XI	1	—
XII	2	—
Total	106	100

II. Types of Delivery

Type	Anaesthetised group	Control group
Spontaneous delivery	68	82
Forceps	18	14
Breech	18	4
Internal version	2	—
Total	106	100

III. Condition of Foetus

	Anaesthetised group. Total of 106 cases	Control group
Twins	2	—
Premature	10	5
Stillbirths	7	4
Neonatal Deaths	5	—
Congenital anomatics	3	—

IV. Weight of Infants in Anaesthetised Group

Number of Cases	Weight in lb.
1	1·8
1	2
7	3
12	4
22	5
31	6
27	7
5	8
1	9·4

V. Relief of Pain in Anaesthetised Group

Complete relief	...	99 cases
Partial relief	...	5 cases
No relief	...	2 cases

VI. Untoward Effects

	Anaesthetised group (106 cases)	Control group (100 cases)
Temperature	16	14
Headache	16	8
Neuritis	5	12
Catheterisation needed in	9	—
B.P. fall	9	—
Sciatica	1	—

* Control cases were selected at random from the author's practice during the same period.

VII. Headache After Anaesthesia

Duration of headache	Anaesthetised group (106 cases)	Control group (100 cases)
Headache	90	92
For 1 day	7	6
For 2 days	4	—
For 5 days	3	—
For 10 days	—	2

Time	Anaesthetised patients (106 cases)	Control group (100 cases)
Within 10 min.	82	95
Within 20 min.	23	4
Within 35 min.	4	1

VIII. Temperature

	Anaesthetised group (106 cases)	Control group (100 cases)
No temperature	90	82
Low temperature	14	14
High temperature	2	4

No marked *full of B.P.* was noted in any of the cases. Some cases showed drop of B.P. more than 20 mm. of Hg. but these were cases of eclamapsia and pre-eclampsia. They however readily responded to ephedrine and oxygen therapy.

Condition of infants :—Babies were born with good colour and muscular tone ; cry and breathing was often spontaneous. The cases of asphyxia and stillbirths that occured were due to some other cause. Two cases were of twins. Ten children were born premature. Seven were stillbirths, out of which four were due to prematurity. Six infants showed congenital abnormalities. Five neonatal deaths were recorded, one due to an abnormal tumour of the size of a cocoanut at the anal end. Two died as twins born premature and weighed 2·13 and 3 lb. respectively. Two others weighing 1·8 and 1·12 lb. died due to prematurity. The maximum weight noted was 9·4 lb. and the minimum weight noted was 1·8 lb.

Control series :—In the control series 82 were spontaneous deliveries. 14 were forceps deliveries and four were delivered by breech.

Headache was noticed in 8 cases ; but only in 2 cases did it persist for 10 days. Backache and neuritic pain was observed in 12 cases. Low temperature up to 99°F. was noticed in 12 cases; in four cases 100 to 102°F. a temperature of 100° to 102°F was present for 3 days, due to mastitis.

The duration of the third stage of labour was about 10 minutes in 95 cases ; it was prolonged up to 20 minutes in 4 cases and up to 35 minutes in one case.

Five of the infants born were stillbirths, of which four were premature ; three showed congenital anomalies.

Discussion.—Saddle-block anæsthesia has a very definite place in obstetrics, particularly in the second stage of labour. It does not interfere with the progress of labour, possesses simplicity and ease of administration and facilitates the management and care of obstetrical patients. Thus saddle-block anæsthesia is at present the ideal.

Neurological complication, though rare, is always potentially present. Trauma to the nerve or cord may be suggested by radiating pain or bloody tap. Impurities, deterioration, and contamination of the drug are the causes for neurologic complications.

Post-spinal headaches were not severe enough to cause worry. The 15 per cent incidence of post-spinal headache is very high, but it persisted for 3 days in only 5 cases and for 10 days in only 2. In none of them was it however, severe.

The headache is due either to the hypodynamics of the cerebrospinal fluid or to the pooling of blood in the splanchnic vessels and in the lower extremities. The sudden release of intra-abdominal pressure occurring *post-partum*, is further augmented by the vasomotor paralysis due to the action of the spinal anæsthesia on the splanchnicnerves.

The duration of headache in 5 cases was 3 days, and in one case 5 days, but severe in none. Prostigmine, benadryl, ephedrine, nicotinic acid were all tried. An abdominal binder stretched tightly over a folded bath towel placed on the abdomen gave considerable relief.

Selection of patients.—1. Absence of contraindications, such as cerebrospinal disease, pyogenic infection at or adjacent to the site of the puncture, poor condition of the patient (shock, coma, sepsis, severe hypotension, etc.) hypersensitivity to the unfavourable type of patient (neurotic type, those suffering with chronic back-ache, headache or migraine).

2. Administration at late first stage or early second stage of labour when delivery is expected to occur within two hours.

3. Observance of requisite precautionary measures.

(*a*) Barbiturates to counteract possible spinal reaction (particularly) where cocaine derivatives are used ; nupercaine is a quinoline derivative.

(*b*) The routine use of ephedrine prior to the administration of a spinal anæsthetic agent partly to guard against preventable fall in blood-pressure and partly for prophylaxis against allergic manifestations, of which post-spinal headache is probably one.

(*c*) The administration of oxygen in all cases together with the prompt effective treatment of maternal hypotension.

(*d*) Avoidance and prevention of complications.

Small gauge spinal needle, spinal puncture made with the level of the needle into vertical position to avoid cutting the dura, the use of only perfect needles, the thorough washing of all needles and syringes, the use of a separate needle to withdraw the anæsthetic agent from the ampoule—are essential precautions.

The selection of the time of administration requires some elaboration. I have satisfactorily controlled the discomfort of the first stage of labour by the effective use of drugs like pethidine, chloral hydras and bromide, reserving saddle-block anæsthesia for the late first stage or early second stage of labonr. Too early administration may impede the progress of labour or necessitate either a repeat injection of the spinal anæsthetic with its concomitant risks or recourse to other forms of delivery—anæsthetics. In the latter event, there is no advantage to be gained from spinal-anæsthesia but the potential danger is too great to justify its use.

Advantages.—*To the foetus*:—Saddle-block anæsthesia when properly used provides maximum protection to the fœtus: (1) pharmacologically as the toxic drug-reaction and depression to the baby are absent and (2) mechanically, as the trauma to the fœtal head is minimized by the elimination of involuntary bearing-down-reflex.

To the labouring mother:—Successful saddle-block anæsthesia provides absolute comfort almost immediately and the labouring mother is enabled to take adequate nourishment, fluids and good rest. Further the presenting part is brought to the outlet, exclusively through the uterine contractions.

To the nursing staff:—The care of the patient is made easier. Only a minimum of equipment is required, and the perfectly clear mind of the patient makes nursing care simpler. Due to the nature of anæsthesia, last minute confusions and excitement of imminent delivery are eliminated.

To the obstetrician:—The advantages are many: It is the anæsthetic of choice for the cardiac patient as well as for patients suffering from respiratory disorder. The danger of respiratory complications, and the additional narcotizing effect of supplementary delivery—anæsthesia in patients given heavy pre-delivery sedation are eliminated. The simplicity of administration makes its use available to all.

The increased incidence of operative deliveries is stated to be a disadvantage in the use of saddle-block ; but as a terminal procedure, it will eliminate much of this objection, as rotation will occur usually before the late first stage or early second stage. The number of spontaneous deliveries can be increased by utilization of the accessory muscle of expulsion synchronized with the uterine contraction.

Summary.—One hundred and six attempts at saddle-block anæsthesia with heavy nupercaine solution have been analysed, along with 100 controls.

It was found to provide complete subjective relief in 99 cases and incomplete relief in 5 cases and no relief in only 2 cases. All the patients were delivered solely under the effect of saddle-block anæsthesia, except in two cases where internal version had to be done after additional general anæsthesia, which was used to supplement the spinal effect, permit operative manoeuvres and also for psychological reasons. Subjective relief obtained was of 2 hours' duration on an average, but the perineal anæsthesia usually exceeded 3 to 4 hours' duration. Suturing of episiotomy wound or tears, sometimes done a little later, did not require any fresh or extra-anæsthesia. Only 12 deliveries took place after 2½ hours.

The proper time of administration was in the late first stage or early second stage of labour. The incidence of operative deliveries was high, because the anæsthetic was used particularly in complicated cases, abnormal presentations, primiparæ, and in mothers with associated constitutional diseases. In all these cases I attended personally while the delivery in control cases was conducted by the sister and the House-surgeon.

The untoward effects noted in the mothers, were of a very minor kind. Not a single case showed spinal reaction. The B P. was lowered more than 20 mm. of Hg. only in a few cases which had pre-eclampsia or eclampsia; but no harmful effect was noted as a result. Five cases showed signs of pressure, neuritis, tingling and pain in the lower limbs which disappeared even during their stay in the hospital. One patient showed radiating pains in both lower limbs, which subsided after 3 weeks. In the control group nine cases showed signs of neuritic pains and back ache. In two cases the back-ache persisted for two weeks.

There were 16 cases of headache, which persisted in only 5 cases for more than 3 days. A tight abdominal binder gave good relief. In the control series, there were eight cases of headache, which persisted in two for 10 days.

There were 12 dead babies, of which seven were still-births and five were neonatal deaths. Four of them were due to prematurity, and one to a congenital abnormal tumour at the anal end.

Conclusion.—Saddle-block anæsthesia is the nearest approach to the ideal for inducing obstetrical analgesia and anæsthesia when judiciously used by an experienced obstetrician. The great measure of safety to the fœtus and the mother, the dramatic relief of the discomfort of labour and the simplicity of the technique make it sufficiently attractive to the nursing staff and to the attending obstetrician.

It is imperative however that the technique should be scrupulously clean and meticulously observed and all precautions taken to guard against any danger.

SUPPRESSION OF LACTATION

Suppression of lactation is induced by a single intramuscular injection of testosterone cyclopentylpropionate in cottonseed oil given during the intrapartum or early postpartum period. With a dose of 100 mg. of depot-testosterone, Dodek and his associates in Washington, found that secretion is controlled and pain of breast engorgement ameliorated more effectively than with œstrogen or other forms of androgen. Virilism does not result Of 125 women receiving such therapy only 12 had uncomfortable breasts for more than twenty-four hours; 41 had no discomfort. Though all but 5 had some swelling of the breasts, 111 were able to wear their own brassieres during the entire postpartum period.—*(J.A.M.A., 154: 309-311, 1954 via Mod. Med., 15-9-'54).*

THE RELIEF OF PAIN DURING LABOUR

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A CONSIDERABLE volume of literature has recently sprung up under "Painless labour," "child birth without fear" and kindred headings, all calculated to impress the facts that labour and delivery are perfectly normal physiological functions, that fear is really responsible for the labour pains and that the intensity of the pains has a relation to the extent of fear and other emotions. Modern educated women, have learnt to benefit by such literature to some extent, and some face the pains boldly; others clamour for relief and the attending physician has to respond.

The pain during labour at each contraction of the uterus is mainly due—not to the actual, contractions themselves—but to the dilatation and stretching of the cervix, the vagina and the perineum which result from the contractions. The pain is very severe when the cervix begins to dilate and becomes most acute when the perineum becomes stretched as the head is pushed out.

The intensity of the sensation of pain bears a relation to the intensity of the exciting stimuli and also to the sensitivity of the end-organs, the efficiency of the conducting nerve fibres, and the response from the brain itself. The appreciation of pain, as of other sensations like heat, cold, sound, light, etc. is more developed in the educated civilized people than in the rural rustic population. Civilization has apparently taught us, among other things, to appreciate painful sensations to a greater extent and to recall their memory long after the cause has ceased to operate.

The severity of the pain also varies with the individual and some will greatly exaggerate even subminimal pains. The following quotation from a recent issue of the *Journal of Obstetrics and Gynæcology of the British Empire*, is of topical interest in this context:

"Pain is the commonest of all the symptoms and yet the most claimant symptom which a physician has to deal with. It drives a patient to her doctor whose urgent duty is to afford relief and at the same time a search for its causes sometimes forms one of the most difficult problems which he has to face on the clinical side. Volumes have been written on it. Interest in pain is not confined to the medical world only. Even philosophers have pondered over it and problems on pain have issues of great significance in metaphysics and theology. Pain is taken in the same category as emotions and feelings which like the sensation of sound, light, scent etc., are

impressions made on our percipient mind by the physical and quantitative world and which are inferred from the mediating experiences."

Some people take exception to the 'relief of labour pain' on religious grounds and obstetricians who are conservative in their methods and technique of the management of labour are averse to the use of anæsthetics for the relief of pain during labour. This attitude is not however justifiable. As I stated before, the individuals and their intensity of suffering due to labour pains vary widely as also their powers of endurance. So it stands to reason that the pain, when intense, should be relieved, particularly when the means whereby such relief is afforded are simple, effective and with ordinary precautions quite safe. Such relief will not only reduce physical suffering but its memory will not cause mental uneasiness and fear in respect of subsequent labours. Further from the obstetric point of view, it must be realised that pain, if unrelieved for a long time is liable to cause fatigue and emotional disturbances and these are important factors in inhibiting proper uterine contractions. The relief of pain, therefore, may actually help to shorten the labour and secure natural delivery. It is no doubt true that strong sedatives and anæsthetic drugs used too early in labour to procure relief, may themselves inhibit uterine action. If proper judgement is exercised and the suitable drug is chosen and given in proper doses at the proper time, the balance will be all in favour of relief and definite obstetrical advantage by the abolition of emotional and fatigue factors. Sir James Simpson gave chloroform intermittently to Queen Victoria in 1853 and since then the method has been popularly known as "*Anæsthesia a la Reine.*"

The analgesic requirements of the 1st stage of labour are different from those of the second. As soon as labour has become definitely established and the woman is beginning to feel some distress a dose of Chloral hydrate as much as 15 grains together with Pot. bromide 15 grs. dissolved in a glass of sweetened lemonade may be given. It should be drunk in sips lest it might be vomited out. It makes the patient drowsy and makes her sleep in between the pains. These drugs may be repeated in half the above doses every three hours according to the distress due to pain showed by the patient.

In a primipara in whom the labour is expected to continue for some hours, ¼ gr. of morphia with atropine 1/100 gr. should be given. Morphia is generally blamed for prolonging the labour but Bourne and Burn have experimentally proved that although the intervals between the uterine contractions are increased, the length of time over which the uterine contractions are sustained are also increased. Theoretically therefore, its use might actually diminish the first stage of labour whereas the relief obtained by the patient is something very definite. It must not be forgotten, however, that morphia has a depressant action on the child's respi-

ratory centre and must never be given if the delivery is expected within three or four hours. Pethidine hydrochloride in doses of 50 to 100 mg. is much safer and less depressant. It may be given along with Hyoscine hydrobromide in doses of 1/300 to 1/150 gr. Pethidine along with this larger dose of hyoscine *i.e.* 1/150 gr. sometimes makes the patient so drowsy that she does not later on remember anything about the delivery. At times the nurses find it difficult to get the patient to co-operate.

The sedative effect of morphia can be intensified and prolonged if given intramuscularly along with 2 cc. of 50% of Sol. of magnesium sulphate. A further prolongation of the effect can be obtained by further injections of 2 cc. of 50% Sol. of magnesium sulphate alone. Here we have an example of the synergistic action of different drugs. Gwathmey made the fullest use of this synergistic action of various agents. Besides injections of morphia and magnesium sulphate he administers a sedative mixture by the rectum. This mixture consists of :—Ether 2½ oz.; Quinine alkaloid 20 gr.; Alcohol 45 minims; Paraldehyde 2 drachms; Olive oil 4 oz.

The technique of high rectal instillation is troublesome, sometimes resulting in proctitis and so I have not used this method.

The "Twilight Sleep" induced by injection of ¼ gr. morphia and hyoscine hydrobromide 1/150 gr. atropin sulphate 1/150 gr. and then followed by graded doses of scopolamine has been tried for a number of years. Some are very enthusiastic about it while others are frightened by the complications that sometimes crop up.

The barbiturates have been used in doses of Nembutal 3 grs. or Sodii amytal 0·4 gr. or Seconal 0·3 gr. by mouth together with scopolamine gr. 1/150 hypodermically. These drugs can be repeated in half the doses 3 hourly. In some cases œdema of the lungs and reduction in the prothrombin level of both the maternal and fœtal blood are noted.

Paraldehyde is certainly a good drug but is abhorred for its smell. It can be given by mouth, rectally or by intra-muscular injections of 5 to 6 cc.

Continuous caudal anaesthesia has been widely practised in America. They use 1·5% Metycaine in normal saline to which Ephedrine is added. Malleable, stainless steel 19-gauge caudal needle is introduced into the sacral canal 2 inches above the tip of the coccyx. If no blood or spinal fluid is withdrawn, 22 cc. of the anæsthetic solution is injected by a syringe initially to note the reaction of the patient. Ten minutes after the last dose, 22 cc. are slowly injected. Later on 20 cc. are injected every 40 minutes. The average total dose of the solution required was 200 cc. It produces such relaxation of the pelvic floor that P.O. positions become common. Normally the levator ani muscles by their contractions push the advancing portion of the fœtal skull. Low spinal

been tried but it often leads to abnormal labour. Intravenous drip of alcohol in glucose with another drip of Pitocin has been tried but it requires considerable technical skill and attention. The same is the case with Pentothal and Noverdine drips, which are harmful to the fœtus *in utero*.

Anaesthetics during the 2nd stage: *Chloroform*:—The best way to use it is in Junker's inhaler and if a mask is placed in one of the hands of the patient and a rubber pressure bulb in the other, it will be found that by means of a few good squeezes of the bulb and a few deep inhalations at the commencement of each pain, the mother is greatly relieved of her suffering and is yet able to employ her accessory expulsive forces. It is surprising to find that not more than 3 or 4 drachms of chloroform is consumed by this method. The great disadvantage of chloroform is that it may lead to liver atrophy and retardation of uterine contractions. Ether like chloroform is also an inhibitor of uterine contractions. Often the pains come and disappear by the time the chloroform begins to act. Trilene vapour is heavier than chloroform and is used in a specially-made bottle. The results are better and Trilene is not so harmful as chloroform. I am using Trilene in some cases but the amnesia induced is not as good as with nitrous oxide.

Nitrous oxide and air:—It has been conclusively proved that this gas does not inhibit uterine contractions but in some cases, augments them. When mixed with air and used in the proportion of 45 to 60% it has no bad effects on the child's respiration after birth. Minitt's apparatus is very well-suited for self-administration of this gas and I am thoroughly satisfied with its use as judged by the results in 600 cases of labour which I personally watched.

The hole in the mask which the patient must close, in order to suck in the gas mixture serves as a safety valve to prevent overdosage. When the patient has had too much of the gas, her finger automatically relaxes and she is not able to close the hole with the result that she gets only the air and no gas. The attending nurse must not however, be tempted to close the hole with her own finger which will bring about an overdosage, blueness of finger nails and asphyxial convulsions.

Since the extent of relief obtained is directly proportional to the amount of the gas inhaled, the patient must be taught to breathe freely through the mask without any fear, long before the gas is actually started. If this preliminary practical instruction is not given, the patient gets confused when severe pains start and instead of breathing begins to strain or shout with the result that the gas is not inhaled in sufficient quantity and no relief is therefore, obtained ; a good device is thus unnecessarily abused. She should also be told to begin breathing deeply through the mask as soon as the slightest hint of approaching contraction is obtained and not wait till the contraction has well set in. Curiously enough the

woman who has lost fear of gas is able to apprehend the approach of contraction in proper time. Just when the gas is started, nearly all mothers say that they feel suffocated and would rather not take the gas. With a little persuasion, if six or eight deep breaths are taken she would not allow the mask to be removed from her hand because the relief obtained is very great. She can then continue to take the gas intermittently for a number of hours. My own niece took it for six long hours without any bad after-effects either on herself or on her child. Generally it is said that the gas apparatus should be started when the cervix is dilated to the size of a rupee. In my practice, I rarely make a vaginal examination in a normal labour case and hence I depend upon the frequency of uterine contractions to get an indication for starting the gas apparatus. I start the apparatus when the pains come on, at about five to seven minutes' intervals, and on an average I find that a multipara delivers from one to one and a half hours after the starting of the gas apparatus and a primipara in about three hours. I warn the sister and the attendants not to talk in the labour ward so that the patient should hear nothing but the occasional words—"Go on breathing and take the gas." In this way she remembers very little, the next day and sometimes she even declares that she did not know when the baby was born. The relatives must be strictly warned not to talk with her nor enquire of her whether she felt relief from the gas until she has had one good sleep. About 50% of the mothers complain of headache during the next twenty four hours which may be easily relieved by an injection of morphia or a tablet of aspirin.

By carefully choosing suitable patients one can be sure that no harm results from gas either to the mother or to the child. Thus it should not be given to those who have serious lung and heart troubles or to those who have high blood-pressure or are suffering from albuminuria or A.P.H. Also I do not give it to those in whom there is any obstetric abnormality which may require some artificial aid later on. In such cases it will not be possible to judge the proper time for obstetric interference, as the patient is under gas-air-analgesia.

So far I have had no untoward results and only very few failures. Sixty cases or 10% declared that though they could say who were present in the delivery room, they could not remember the actual time when the actual delivery took place. The cry of the child was the first indication for these mothers that the delivery has been completed.

Conclusion.—The following observations are based on my personal experience.

(1) There is no danger either to the mother or to the baby when cases are carefully and properly chosen.

(2) The mother does not lose consciousness and is able to follow instructions and bear down better because pain is eliminated. Thus the need for the use of forceps necessitated by poor bearing-down efforts in some cases is obviated.

(3) Neither the liver nor the blood is affected by the gas, as is the case with chloroform, because with each expiration the gas is also expelled.

(4) After delivery the child breathes as usual, and there is no increase in the incidence of asphyxia neonatorum.

(5) The process of delivery is not slowed, but on the other hand it is quickened in some cases. Experiments have conclusively proved that whereas chloroform, ether and morphia diminish uterine contractions, No. 2 gas increases them.

(6) Minitt's apparatus is so devised that the mother is able with her own hands to use as much gas as she wants and that a safety device prevents overdosage.

(7) Except for a slight headache there are no after-effects in the mother and none at all on the child. On the other hand, considerable relief from pain and suffering and the absence of a feeling of tiredness on the following day, are definite advantages.

In order to obtain complete relief from pain, the gas mixture should be stronger in concentration but then it may not be quite safe. Chasermoir has improved upon the apparatus by introducing an accessory bag which contains pure gas and which the patient is able to consume at the commencement of each contraction, thereby getting quickly under its effect. The influx into the bag is automatically closed by a valve as soon as it is filled up. After utilising a measured amount of pure gas from this accessory apparatus at the commencement of each contraction, the patient is able to inhale only a diluted gas mixture.

Science has not been blind to the need for relief of the sufferings of the women in labour, who can now look forward to painless delivery without danger to themselves or harm to their infants.

ACTH AND CORTISONE DURING PREGNANCY

Toxæmia of pregnancy is not benefited, induced or aggravated by the administration of ACTH or cortisone. From the results of treating 24 obstetric patients with the hormones for ailments unrelated to pregnancy or for the toxic condition, Margulis, and associates of the Henry Ford Hospital, Detroit, conclude that gravidas have increased tolerance to corticotropin and cortical steroids.—(*Am. J. Obst. and Gynæc.*, 67 : 1237–1248, 1954 Via *Mod. Med.*, 15-9-54).

The opinion of the great body of the reading public is very materially influenced even by the unsupported assertions of those who assume a right to criticize.—(Lord Macaulay).

The real problem for the deaf themselves is not so much the deafness as the fact of living in a hearing world !—(K. W. Hodgson).

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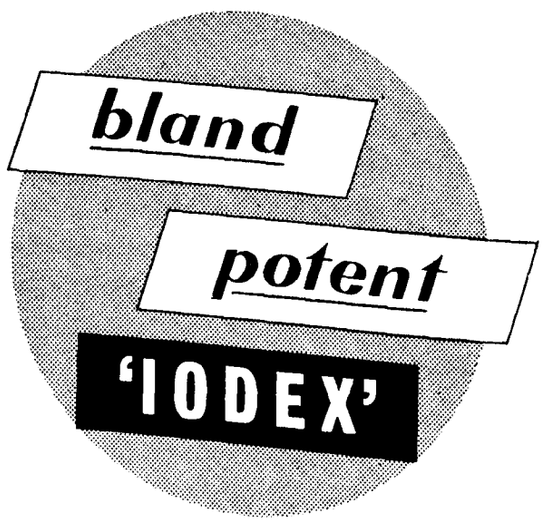

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P44IND.

A NEW METHOD OF OPERATIVE TREATMENT FOR HABITUAL ABORTIONS IN THE SECOND TRIMESTER OF PREGNANCY

Prof. V. N. SHIRODKAR, M.D., F.R.C.S., F.A.C.S.,
Professor of Midwifery and Gynaecology, Grant Medical College, Bombay

THERE are some unfortunate women who abort repeatedly between the fourth and seventh months; no amount of rest and treatment with hormones seem to help them in retaining the products of conception. I have seen in my practice thirty such women up to now; some of them had nine to eleven miscarriages. The smallest number was four abortions. The attempts of obstetricians all over the world to solve this problem satisfactorily have met with very little success.

Nearly ninety five per cent of these cases are, in my opinion, due to a weak cervical sphincter and the other few to an underdeveloped or malformed uterus, etc.

My work so far has been confined to cases where one can, by repeated internal examinations, prove the existence of weakness of the internal os, which gradually yields to the rising intra-uterine pressure. There is thus a passive dilatation of the cervix without any labour pains, the membranes sometimes protruding right up to the vulva. All these cases can be saved by a simple operation, done during pregnancy, when one finds that the cervix is gradually yielding. I have operated upon them, even when they had entered the seventh month of pregnancy, with no ill effects and they have gone to full term.

I am publishing this report in order that hundreds of women in our country who suffer from this unfortunate handicap may benefit by this operation which will enable them to fulfil their cherished desire of having live children. The technique of the operation is detailed below:—

(1) A strip of fascia lata is removed from the outer side of the thigh "quarter of an inch wide and four and a half inches long and each end of this is transfixed with a linen suture.

(2) The cervix is pulled down and a transverse incision is made above the cervix as in anterior colporrhaphy and the bladder is pushed well up above the internal os.

(3) The cervix is then pulled forwards, towards the symphysis pubis, and a vertical incision is made in the posterior vaginal wall, again at and above the internal os, going *only* through the vaginal wall.

(4) Through the right and left corner of the anterior incision an aneurysm needle is passed between the cervix and the vaginal wall till its eye comes out of the posterior incision.

(5) Pass the linen attached to each end of the fascia through the eye of the aneurysm needle and pull the right end of the fascia retrovaginally forwards, into the anterior incision. Do the same thing from the left side.

(6) Let the two ends of the strip cross each other in front of the cervix and tighten them so as to close the internal os. Your left index finger in the internal os will tell you how much to pull on the strips. Your assistant should be holding one end of the strip with an artery forceps.

(7) Stitch the two ends together by a number of stitches which take a bite of the muscle fibres of the lowest part of the lower uterine segment using a small curved needle and fine linen.

(8) Extra portions of the fascia are cut out and the anterior and posterior incisions are closed with chromic catgut No. 0.

The patient is kept in bed for a fortnight and then gradually allowed to walk. She should not lift up weights and must not strain at stools. Any painful contractions of the uterus after the operation are best relieved by injections of Dipro-panex.

Note:—I have a 16 mm. colour film of this operation. Surgeons who wish to see the entire technique may write to me through the Editor of the ANTISEPTIC, Madras-1. The film was shown in New York, Paris, London and Switzerland and the technique has received world-wide recognition.

It is better to deliver these women by a cæsarean operation as the repair is undone by a vaginal delivery. If a patient wants just one child she may be allowed to deliver per vaginum. There are many young patients who have undergone a Fothergill operation for prolapse of the uterus. Since the cervix is amputated as a routine in this operation 50% of them abort due to the destruction of the cervical sphincter. Even for such cases my operation detailed above, is of great value. Being thoroughly dissatisfied with the Fothergill operation I have devised two new operations for prolapse, one vaginal and one abdominal, by which a prolapse can be cured without amputating the cervix.

Patel Chambers,
French Bridge,
Bombay-7.

UTERO-TUBAL INSUFFLATIONS

Lessons gained from over 4,000 uterotubal insufflations during 25 years by Dr. Sharman are: —The theoretical advantages of CO_2 are manifest. There were only 5 cases of infection and no deaths. Two or more tests with the pressure advanced to 250 mm. Hg., provide a reliable diagnosis of nonpatency. 902 patients with primary sterility were followed up for a year; 30 per cent of them became pregnant. Uterine sound was passed in 253 patients; only 17·7 per cent became pregnant in 12 months. The kymograph was found to be a very useful adjunct in this procedure.—(*Br. M. J.*, p. 239, 1954, via *Int. Abst. Surg.*, Nov. 1954).

RETAINED PLACENTA AND ITS MANAGEMENT*

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Though remarkable progress has been made during the last few years in the treatment of retained placenta and post-partum hæmorrhage, resulting in an appreciable reduction of maternal mortality and morbidity, the ideal has not yet been reached. Even now, more mothers die of complications during the third stage of labour than during the other two stages considered together.

The reduction in maternal mortality and morbidity has been due mainly to the prevention of blood-loss after the birth of the baby by proper anticipatory lines of treatment commencing from the ante-natal period and active therapy in the bleeding phase by prompt replenishment of blood-loss by transfusions and by the use of the now readily available anti-microbial drugs. Women, who are under-nourished are nine times more prone to develop uterine inertia and its consequent complications. Proper ante-natal care will remedy several factors predisposing to ill-health. Preventive treatment includes suitable measures to combat the effects of a long and exhausting labour, avoidance of prolonged anæsthesia and/or difficult instrumentation. In the management of the third stage of labour, oxytocics are administered at the appropriate time. Crede's classical method of expression is avoided and placenta removed earlier than what was usual previously.

Ideas regarding the physiology of the third stage of labour, *e.g.*, the mechanism of separation and expulsion of the after-birth, have undergone notable changes. The separation of the placenta is presumed to commence when the head is crowned or just delivered *i.e.*, at the late part of the second stage. The area of placental attachment is reduced to half its original size as a result of contraction superadded to the extreme retraction of the uterine musculature. The complete separation takes about 3 to 7 minutes in a woman, though in the apes the placenta is cast, no sooner than the baby-ape is born. The process of expulsion is achieved by the piston-like action of the upper uterine segment and the corresponding relaxation of the lower. If the patient is left unaided this may generally take about 18 to 20 minutes. The retro-placental hæmatoma is considered to be the result rather than the cause of separation and the classical Schultz's or Mathew Duncan's method is only the respective process of the expulsion of placenta. The bleeding is more apparent during the actual process of expulsion in the latter while it follows the former. Some obstetricians *e.g*, Calkins, believe that much unnecessary blood-loss occurs between the moment of separation and of expulsion of the placenta as a result of increasing

* From a discussion on "Difficult Labour" at the Medical College Reunion, 1953.

retro-placental hæmatoma. So they recommend earlier recognition of placental separation and quicker expulsion.

Thus the management of the third stage should commence when the head is crowned or delivered. If the placenta is expelled at the appropriate time by a well-retracted uterus, the blood-loss will naturally be minimal. So all measures to help the separation as well as the expulsion of the placenta should be adopted by increasing the retraction and contraction of the uterine musculature. This has been possible by the use of the readily available standardised oxytocic drugs *e.g.*, ergometrine, methergin. pituitrin etc. The baby is delivered slowly to help efficient retraction of the uterine musculature—thus helping in the separation of the placenta and when the head is crowned or the anterior shoulder is visible, the oxytocic is administered parenterally. Ergometrine is used in 0·125 mg. dose intravenously (and not exceeding 0·25 mg. or 0·50 mg. if used intramuscularly). Pituitrin not exceeding 1 mg. or better Pitocin is advocated by Nixon, Eastman and others for its quick action exclusively on the upper uterine segment in contrast to that of ergometrine, which acts on both the segments simultaneously. Pitocin is administered in a dose of 2 to 3 units in 10 cc. of normal saline, injected slowly into the vein or 5 units intramuscularly. Methergin has been recommended by some, for its lack of action on the autonomic nervous system, and for the speed and intensity of its action. In our cases we preferred to use 0·125 mg. of ergometrine by the intravenous route, often followed by 0·25 mg. intramuscularly, as we were reluctant to administer pituitrin or pitocin to under-nourished and relatively anæmic patients. We are at present engaged in an intensive study on the use of Methergin and Ergometrine combined with Hyalase by the intramuscular route during the third stage of labour.

Most obstetricians are of the opinion that ergometrine, administered especially by the intravenous route, definitely reduces the amount of blood-loss in the third stage of labour and also hastens the separation of the placenta. They advise removal of the placenta if not expelled within an hour, even if there is no bleeding, in order to guard against the potential dangers of post-partum haemorrhage shock and infection. Sheehan has advanced convincing data in support of the latter procedure. Some clinics in the States advocate and practise even prophylactic removal of the after-birth. Others contend that the administration of ergometrine at the end of the second stage of labour increases the frequency of incarceration of the placenta though it may well diminish the blood-loss. Statistics in support have been adduced by both the schools. It is yet premature to say if these ideas have come to stay or will be forgotten like many other conventions in medicine.

In the context of the above observations are here presented the results of a comparative study of the incidence of retained placenta and of the treatment given in the Eden Hospital, between 1936 and 1945, when blood transfusion or antibiotics were not readily available; repeated Crede's expression was practised as a routine, the placenta was removed late and oxytocics administered only after expulsion of the placenta, and of similar studies during the last three years 1950 to 1952, when blood transfusion or its substitutes, slow delivery of the head, use of intravenous ergometrine just when the head was out of the vulva and early removal of the placenta were practised. During the period of ten years ended 1945, there were 30,280 confinements and manual removal was performed in 58 or 0·19%. Mortality reached the high figure of 8% when the placenta was removed early and 20%, in late cases. The morbidity figure was 60%. In the 3 year period, 1950—1952 there were 21,003 confinements and manual removal was performed in 64 cases, the incidence being 0·3%. There were 4 deaths, directly due to the operation *e.g.*, 0·63% and the morbidity was 28%. Incarceration of the placenta occurred in 8 cases. In this study the placenta was called retained, when it was not expelled within one hour after the delivery of the child.

The clinical types of retained placenta, treated during the last three years in the Eden Hospital and the exact management of each group will now be discussed in greater detail. Instances where the placenta was completely separated but occupied the lower uterine segment or vagina are not included in this discussion.

1. Retained placenta accompanied by post-partum hæmorrhage comprised the largest group. The uterus was found atonic and the placenta partially separated. Sudden copious bleeding was infrequent, and small but recurrent blood-loss was more common. In the latter cases the fall of blood-pressure and the rise of the pulse-rate and respiration were noticed after an interval, sometimes of one to two hours, when the vasomotor system failed to accommodate the added blood-loss. Before this interval, there were seldom any untoward symptom to warrant any active interference. Some of the patients were ill-nourished or had prolonged labour, anæsthesia or difficult instrumentation. There were four instances of twins and hydramnios with over-distension of the uterus and 6 cases of antepartum hæmorrhage, where preventive treatment for the control of post-partum hæmorrhage of retained placenta had very little effect.

The uterus was massaged quickly to make it hard, the bladder was emptied, infusion of fluids (saline-glucose, Dextran or Plasmosan) started till the arrival of blood and 0·125 mg. ergometrine was injected intravenously (or 0·5 mg. by the intramuscular route). When the uterus became hard and showed signs of the placenta separating, the fundus was gently pressed downwards and backwards. In most cases this was enough to expel the placenta and the bleeding

was arrested. Crede's expression of the placenta was *not* tried in any case in order to avoid trauma and/or shock. When the uterus failed to regain proper retraction and contraction and when there was small but repeated bleeding in patients who had prolonged labour, instrumentation or extensive birth-injury, no time was lost in removing the placenta manually. Under surgical anæsthesia (Pentothal sodium or gas and oxygen did not produce adequate relaxation) the gloved hand was carefully introduced into the uterus following the cord with due aseptic and antiseptic precautions. The placenta was gradually peeled off, commencing from the edge already separated, aided by the other hand placed on the abdomen. The hand was withdrawn when the uterus became hard and was not re-introduced unless any cotyledon or a succenturiate lobe was found to be missing. There were a few cases, where the operator had to wait for about 30 minutes or even an hour and a half to allow the effect of ergometrine to pass off, before the hand could be introduced in the uterine cavity. Prophylactic penicillin up to 4 lacs units was administered in each case after proper measures of resuscitation were carried out in a separate observation room, till the patient recovered from the effects of blood-loss and shock. We found that the provision of a separate observation-ward under a good team of workers has definitely helped to reduce both the mortality and morbidity in these cases.

2. The second large group comprised cases of retained placenta, where there was no bleeding. The uterus felt doughy and though the fundus could be moved from side to side, there was no sign of separation of the placenta. The general condition of the patient was satisfactory in most instances. Some of them had been treated during the ante-natal period for anæmia or for a moderate degree of pre eclampsia or essential hypertension. Two had been delivered of twins.

The placenta was manually removed in most cases. Crede's method was avoided and simple expression tried once or at the most twice when the uterus was found better retracted. Parenteral administration of ergometrine helped to separate the placenta only in a few cases. There were more instances of partial separation of the placenta and onset of bleeding after the injection precipitating manual removal. The time of interference depended mainly on the general condition of the patient and availability of adequate measures of resuscitation. The average interval ranged from a minium of 2 hours to a maximum of 12 hours. Only in one case of anæmia, had the operation to be deferred for 24 hours. Manual removal was more difficult when performed after an interval of 4 to 6 hours due to the partial closure of the cervical canal. Patients treated for essential hypertension or pre-eclampsia often suffered from shock, following this operation even though the blood-loss was minimal. The obvious signs of shock appeared 2 to 4 hours after the manual removal. Oliguria occurred in one case.

Mojon-Gabaston technique of injecting 250 to 300 cc. of sterile normal saline in the umbilical vein was tried in 4 cases with unsatisfactory results. There was severe shock in one patient after the injection.

Retained placenta due to hour-glass contraction occurred in about 14% of cases in the series. All had intravenous ergometrine, even twice and in some there was a history of malhandling of the fundus to expedite the expulsion of the after-birth. The uterus was contracted and the bleeding was small but increased whenever the fundus was pressed down. There was no case of balooning of the atonic upper segment with blood, as described by Greenhill. The administration of morphine, deep chloroform anæsthesia and antispasmodics, like amyl nitrate inhalation, adrenaline hydrochlor or Depropanex etc., often relieved the spasm. The hand was gently introduced through the ring before the action of these drugs passed off and the placenta gently removed. This had to be brought out piecemeal with sponge-holding forceps on two occasions, when it was not possible to introduce the hand beyond the contraction. There were two cases of uterine fibroid in the lower part of the body of the uterus, where the placenta had to be removed by slowly insinuating the hand beyond the tumour.

There was no instance in the whole series of complete placenta accreta or increta, where the decidual layers—either one or both were absent. Partial accreta was noted in 3—two had the placenta attached to a previous cæsarean scar (one had been delivered of twins) and in another on the septum of the uterus subseptus. The dense attachment of placenta was only discovered when the hand was introduced in the uterine cavity. Manual removal was successful in all these patients but moderate post-partum hæmorrhage followed, due to the delayed retraction of the uterus. In atypical placenta accreta there is no bleeding and hysterectomy is undoubtedly the treatment of choice but the decision is momentous when the patient is young.

Recently there were a number of patients admitted into the hospital with retained placenta, where the baby had been delivered outside either normally or with instruments. The patients reached the hospital after an interval of 4 to 18 hours, when several attempts by Crede's expression to expel the after-birth had failed. They were running a temperature, and were often exsanguinated or in shock. Bleeding was absent or very little on admission. The uterus felt doughy and tender and there was no sign of separation of the placenta. No attempt was made to deliver the placenta manually even when the patient recovered from shock or previous hæmorrhage. She was treated by conservatively *e.g.*, resuscitation

with transfusions, antibiotics and later non-specific protein therapy. The height and feel of the fundus and vaginal bleeding were carefully watched. The placenta was cast naturally in more than half the cases in 2 to 11 days. In the remaining cases, the placenta had to be removed either manually or with sponge-holding forceps, only when bleeding started or a fleshy mass protruded through the cervical canal. There was no maternal death but puerperal fever and offensive vaginal discharge persisted for 7 to 10 days. The result was not satisfactory with the administration of oxytocics—even in small doses, nor with Remington Hobb's glycerine treatment. They resulted in partial separation of the placenta in most cases and bleeding, which necessitated removal after dilating the cervix. Shock followed this operation in almost all cases.

Secondary post-partum hæmorrhage was met with in 5 cases out of the 21,003 confinements. A small piece of cotyledon or a large piece of membrane left in the uterus was the offending agent. There was subinvolution; continuation of red lochia and slow evening-rise of temperature. Once they were controlled, bleeding stopped and there was rapid recovery.

Comments.—Though the number of cases presented is small, the great advantages of parenteral administration of ergometrine when the head is born, transfusion before the patient has lost an appreciable amount of blood and the early removal of the placenta are obvious from the discussion. The maternal mortality has been reduced to less than 1% as against the high figure of 14% which was usual only 10 years ago. The establishment of a blood bank inside the compound, the ready availability of blood at any time of the day and a separate resuscitation room managed by trained personnel are largely responsible for this reduction in mortality.

Ergometrine, when administered judiciously will enhance retraction of the uterus, minimise blood-loss and help quicker expulsion of placenta in most cases. It has reduced the number of patients requiring classical expression of the placenta or blood transfusion. An injection of ergometrine gives time to the accoucheur to wait for the arrival of blood, while getting ready for manual removal. A general practitioner, faced with a case of retained placenta in domiciliary midwifery practice may well administer ergometrine to stop the bleeding temporarily till the arrival of the specialist or an emergency squad.

It will be seen from the results that the administration of ergometrine has a potential danger of increasing the incidence of incarceration and sometimes partial separation of the placenta. So when labour is progressing normally in a healthy patient the drug may well be avoided before the expulsion of the after-birth. Moreover, as has been pointed out by Chassar Moir, there may be

a recurrence of bleeding after the effect of the oxytocic has passed off—especially after an injection of pituitrin.

Early manual removal of the placenta and the administration of an oxytocic in the late second stage of labour are of definite advantage in patients, who had long anæsthesia, prolonged labour, instrumentation or birth-injury. But one should always remember the dangers of this operation even when performed by an expert. The maternal morbidity is increased nearly 6 to 8 times when compared to a normal delivery. So a prophylactic indication of removal of the placenta should not be encouraged. The general condition of the patient must be improved, relaxation of the uterus must be complete and all measures of resuscitation kept ready at hand before the hand is introduced into the uterus.

On the contrary, it will be observed that with conservative treatment there was no mortality among those patients admitted with retained placenta and frank sepsis. The retention of the placenta in the uterus even up to 11 days did not produce shock or any severe toxæmia, as stated by Prof. Sheehan.

HYPERTENSION IN PREGNANCY

Hypertension in association with pregnancy and labour is a comparatively common finding. About 5 per cent of all pregnancies progressing beyond the 28th week display this feature at some stage.

Hypertension in pregnancy may be classified as follows:—(1) Pure pregnancy toxæmia (pre-eclamptic toxæmia); (2) chronic hypertension; (3) chronic hypertension with supervening pregnancy toxæmia; (4) chronic nephritis. During a four-year period of the Rotunda Hospital (1949-1953), out of a total of 16,351 deliveries, hypertension was noted in 1,038 cases, an incidence of over 6%. Pregnancy toxæmia constitutes by far the greatest individual cause of hypertension during pregnancy and labour. Pregnancy toxæmia occurs for the most part in the latter weeks, often arising between the 36th week and term and in many cases not until the onset of labour itself. The onset though usually gradual may be fulminating in type. Some of the worst cases of pregnancy toxæmia, actually progressing to the occurrence of eclamptic fits, may occur in the later weeks between routine weekly antenatal visits. Careful blood-pressure recordings, and in particular the accurate recording of weight under standard conditions will often forestall the onset of severe symptoms.

It is likely that if patients with a rise of blood-pressure in the latter months accompanied by an abnormal increase in weight were to be hospitalized, and put on a strict routine of rest, with a diet very low in sodium content, the incidence of acute pre-eclamptic symptoms could almost be eliminated.

From the obstetrical point of view, the aim is to attain a sufficient degree of maturity of the fœtus to render probable a fair chance of survival. The majority of cases become stabilised with strict rest and diet. When maturity reaches the 37th week the possibility of induction of labour should be considered. In these circumstances much better results will be obtained by continuing the routine and awaiting the spontaneous onset of labour. When labour does occur, very strict supervision should be observed, as a marked deepening of the toxæmia is a frequent occurrence during that stage. Strict supervision must be continued

for some hours after delivery, combined with an adequate administration of sedatives to obviate the danger of post-partum eclampsia.

There are, however, cases which may present greater difficulty. These are in particular those who respond poorly to the hospitalization and fail to become stabilized on a strict rest and diet routine, and in addition those who first show severe toxæmia manifestations very early around 30th to the 32nd week. Timely cæsarean section of the premature baby is less of a risk to the infant than dragging on one of these unfavourable pregnancies, with the mistaken view that a little more maturity of the fœtus may be of advantage. Often we have had the satisfaction of attending patients, so treated, in subsequent pregnancies when no toxæmia manifestations recurred and when the previous cæsarean section had in no way proved a source of anxiety. When other factors are also under consideration, such as elderly primiparity and the presence of contracted pelvis, there should be little delay in adopting such a radical line of approach.

Chronic hypertension and chronic hypertension with supervening pregnancy toxæmia:—Patients who are known to have a raised blood-pressure either before conception or before the 20th week should have very careful antenatal supervision during the course of their pregnancies. They should be advised to take a full nourishing diet and especially to observe a routine of organized zest. In addition, salt-intake should be carefully controlled. The real danger associated with chronic hypertension is the occurrence of supervening pregnancy toxæmia which forthwith changes the case from one of comparative safety to one of appreciable risk to the mother and very grave danger to the fœtus. These cases may respond to rest and controlled diet alone and may be further restrained by the careful administration of hypertensive drugs.

Essential hypertension and pregnancy:—A woman who has a persistent blood-pressure of 140/90 mm. Hg. or over, unaccompanied by albuminuria or œdema, which was first found before pregnancy or during the first 20 weeks of pregnancy, is said to have essential hypertension. As the pregnancy proceeds, the blood-pressure level tends to rise in most of these cases but approximately 50 per cent have a successful pregnancy without complications.

Complications of essential hypertension are:—(1) toxæmia; (2) placental separation and fœtal death; (3) cerebro-vascular accidents; (4) retinal changes; (5) cardiac changes as left ventricular enlargement; coronary atheroma manifested by anginal pain and dyspnœa or coronary thrombosis and (6) renal changes.

Treatment of essential hypertension in pregnancy:—In mild hypertension, the basis of treatment is rest and so far as possible the avoidance of anxiety. A mild sedative such as phenobarbitone or 'amytal,' should be given routinely. The usual dose is ½ grain (30 mg.) thrice daily, but this can be increased if necessary. Salt should be excluded from the cooking.

Hypotensive drugs in pregnancy:—As practically all cases of mild or moderate toxæmia respond satisfactorily to other measures, hypotensive drugs are rarely indicated and when necessary the following hypotensive drugs are useful (*a*) veratrum viride; (*b*) hexamethonium compounds; and (*c*) hydrallazine ('apresoline').

Hypotensive drugs have a place in the treatment of the severe hypertensive states of pregnancy but only under constant supervision in hospital. Such treatment is indicated only after the usual well-recognised measures have failed and, when instituted, may improve the immediate outlook for the mother. There is no evidence that the prognosis for the fœtus is bettered; in fact, in certain cases the hypotensive effect may be harmful.—(*The Practitioner*, *174*, pp. 151–159, February 1955).

THE VALUE OF PRE-OPERATIVE ASSESSMENT AND CARE, AND POST-OPERATIVE MANAGEMENT IN OBSTETRICS AND GYNAECOLOGY

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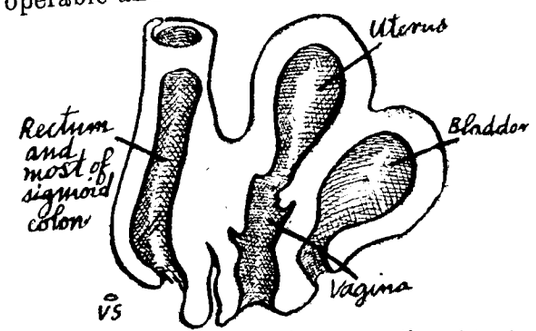
Introduction.—The removal of a cancer of the cervix by an abdominal operation was so lethal a hundred years ago that Diffenbach called it "murder." If he were present in March 1953 at a meeting of the Royal Society of Medicine held in London,[1] and had heard three eminent British gynæcologists, Blaikley of Guys Hospital, Stanley Way of Newcastle and Charles Read of the Post-graduate Institute of Obstetrics and Gynæcology, London, report on a few cases of total pelvic exenterations, which they had successfully performed, I do not know what he would have said.

Total pelvic exenteration is an operation which combines with an accepted Bonney-Wertheim's operation the removal of the bladder, rectum and most of the sigmoid colon. The ureters are transplanted into a midline terminal colostomy made after excising the umbilicus.

The illustration shows a specimen removed at such an extensive and formidable operation. All gynæcologists will agree with Joe Meigs of Harvard that this is an experimental operation which has for its foundation the pioneering efforts made by Alexander Brunschwig[2] and his staff at the Memorial Hospital, New York. This is a bold and desperate attempt to procure at least palliation if not cure, for the unfortunate patients afflicted with an advanced cancer localized within the pelvis and generally considered inoperable and unsuited to radiotherapy.



A specimen obtained following an operation of total pelvic exenteration for an advanced cancer of the cervix.

That patients can survive such heroic procedures is indeed a magnificent tribute to the tremendous advances that have been made in surgery and its allied sciences like anæsthesia, blood transfusion, physiology, biochemistry and bacteriology. The value of pre-operative assessment and care and meticulous post-operative management is being increasingly established.

Above all, the harmonious cooperative endeavour by surgeon, physician, anæsthetist and others, all working together as a team in the interests of the patient can *alone* bring about gratifying results from modern surgery.

Pre-operative assessment.—While pre-operative care aims at making the patient fit for surgery, the object of pre-operative assessment is to discover the exact nature of the lesion and the extent of involvement of adjacent structures. It predicts with striking accuracy what may be encountered within the abdomen and enables the surgeon to plan his procedures well ahead. It is for this purpose that modern medicine, attaches great importance to obtaining a detailed history and making a thorough general and local examination and such additional investigations as may be necessary. To be caught unawares in the abdomen and not be equipped to surmount the difficulties, point usually to inadequate investigation and a lack of surgical experience in the operator.

Diagnosis :—A diagnosis, even a provisional one, must be made before the operation. What is wrong with the patient? What is the lesion and what is its pathological nature? How extensive is it? Has it spread? How much structural damage and functional impairment have resulted? Cancer of the cervix is an excellent example to illustrate what we mean by pre-operative assessment. A blood-stained vaginal discharge during or following menopause, a cervix that is bulky or looks unhealthy, bearing on it an exfoliative growth or an excavated ulcer which bleeds on touch and is friable, indurated or fixed, raises the suspicion of cancer. Endoscopic examination of the vagina (using an instrument with a magnifying lens called colposcope) may reveal unhealthy areas on the cervix. Direct staining techniques such as painting the cervix with iodine to reveal pale non-glycogen containing surface epithelium (Schiller's test), cell studies on cervical smears by expert cytologists (Papanicolaou, Shorr)[3] may yield additional information. Above all a decent biopsy of the diseased portion of the cervix and the pathological study of sections made therefrom may give conclusive proof of cancer. Vaginal examination is part of a complete examination to assess the extent of the growth. The involvement of one or other utero-sacral ligament suggested by induration of the fornices and fixity of the growth suggests that the cancer has spread beyond the cervix. In extensive spread the whole pelvis is filled by the tumour mass (the frozen pelvis of American writers). Direct inspection of the cervix and vagina with a speculum may reveal the extent of vaginal spread. Digital and then proctoscopic examination of the rectum to inspect the rectal mucosa is another important procedure. Paleness or fixity of the rectal mucosa suggests invasion of the rectum. In advanced cases a recto-vaginal fistula may result. Failure to examine the urine and then to visualize the bladder by cystoscopy is unjustifiable. Oedema of the trigone is an early sign while the formation of a vesico-vaginal fistula is a late sign of malignant infiltration. Intravenous urography reveals by outlining the urinary tract if the ureters are displaced or infiltrated and if renal function is efficient. Peritoneal involvement is suggested by the presence of indurated deposits felt in Douglas' pouch and by the clinical recognition of ascites. Involvement of pelvic bones may be diagnosed by radiology. Distant metastasis as in long bones or of the chest may be discovered only by radiography, although these *may* exist without being radiologically demonstrable.

After a complete assessment one must decide on the line of treatment *viz.*, surgery, radiotherapy or a judicious combination of both. Pre-operative improvement of the patient's general condition will enable her to withstand major surgery and will promote speedy recovery. Infected lesions, which may produce toxæmia, require treatment with suitable chemotherapeutic drugs and antibiotics.

Pre-operative care.—If operation is decided upon and the patient is intelligent, the surgeon should acquaint her in a general way as to what is wrong with her and what is proposed by way of surgery.

Discussion and reassurance :—The patient should be reassured and if she enquires whether the operation carries a risk, she should be plainly told that the operation *does* carry a risk which is however, less than leaving her ailment untreated.

Consent :—Consent for both operation and anæsthetic should be obtained in writing and in the case of sterilizing procedures the consent of the husband is essential. To force a major abdominal or vaginal operation on a patient who has no desire to be treated is effort wasted. She will not cooperate and her post-operative recovery may be stormy.

Pre-operative period of stay : —In our country where the average patient is very poor and ill-nourished with a low blood-pressure and low tension pulse, it is particularly important that she should be admitted a week before operation. For most patients, a preliminary stay in hospital for at least 16 to 48 hours for elective operations is advisable in order to make the operation safer.

Malnutrition :—Malnutrition usually goes with reduced protein-intake, vitamin deficiency states and anæmia. Bleeding from the lesion and ankylostomiasis which is fairly widespread both aggravate anæmia.

Hypo-proteinæmia :—Operations on patients without correcting their hypo-proteinæmia is risky. Protein in the body is useful in various ways. Fibrinogen is essential for the proper coagulation of blood. The albumin fraction governs osmotic pressure and blood viscosity, both of which maintain blood pressure.

Plasma protein content:—Plasma proteins which regulate the acid-base-balance form a reserve which the body draws from, in times of stress as in growth during pregnancy, lactation and after injuries or operation. They assist in wound repair. Immune substances protecting the body against infection by organisms are associated with the globulin fraction. In diseases of the liver, alimentary tract, kidney, in various wasting diseases and other conditions associated with exudates or internal hæmorrhages there is a serious lack of plasma protein. The normal values are given in the following table :—

Proteins.—(From *Wellcome Medical Diary*)

Total	...	5·8 to 8·6 g. per 100 cc.
Albumin	...	3·4 to 6·7 g. per 100 cc.
Globulin	...	1·2 to 2·9 g. per 100 cc.
Fibrinogen	...	0·2 to 0·4 g. per 100 cc.
Albumin : Globulin ratio		4 : 1 to 1·2 : 1

If low, then active treatment to correct the deficiency with oral (if necessary even by intravenous protein hydrolysate) therapy should be given. Hypo-proteinæmia causes œdema of the alimentary tract and when severe, of the subcutaneous tissues also. Oedema of the gastrointestinal tract manifests itself by a delay in gastric emptying, decrease in intestinal motility and therefore, an increased likelihood of developing paralytic ileus.

Skimmed milk food is a very satisfactory food, rich in protein and for those who will accept them lean meat, liver, fish, eggs and pancreas are also valuable sources. Several protein foods rich in essential amino-acids (methionine, choline, cystine) and fortified with vitamin supplements are available on the market. Yeast is a valuable addition to the diet. Protein hydrolysates such as Casydrol are suitable for intravenous administration and quantities of 2 to 3 litres may be given daily at the rate of 500 cc. in 2 hours.[4]

Vitamins:—In addition to proteins, vitamins are also needed. Thiamine, riboflavin and nicotinic acid of the B complex group are concerned in amino-acid and carbohydrate metabolism. Vitamin K is a precursor of prothrombin formation and is essential to make the blood clot properly.

Anæmia:—Anæmia may be so severe that it is sometimes surprising how the patient gets about. Degeneration of the cardiac muscle and œdema of the extremities may result. Oral (supported by intravenous if necessary) iron therapy helps but for the very anæmic a carefully administered blood transfusion yields dramatic results. Packed cells may be used, for the weak cardiac muscle must not be over-burdened. Nutritional deficiency anæmias are the most common but tropical macrocytic anæmias do occur sometimes and injections of Folic acid, B complex and liver extract may be needed. All cases of anæmia merit a careful hæmatological investigation H., Hb., R.B.C., M.C.V., M.C.H.C.

Other blood and lymphatic diseases:—Blood dyscrasias, and lymphatic disease may be encountered. A hæmorrhagic diathesis or lymphadenopathy (regional or general) should be investigated. Deficient clotting leads to post-operative oozing (hence shock) and increased susceptibility to clotting leads to venous thrombosis.

Cardiac diseases:—In cardiac diseases like rheumatic fever with mitral stenosis, syphylitic aortic incompetence, or congenital heart diseases complicated perhaps by subacute bacterial endocarditis, the heart may fail suddenly. In coronary insufficiency anoxia may be fatal. Cardiac decompensation must be controlled and the anæsthetic should be chosen carefully. Often spinal is preferred to general inhalational anæsthesia. Where a life-saving operation has to be performed a skilled anæsthetist is a necessity.

Pulmonary diseases:—The presence of pulmonary diseases must be recognized. Operation must be postponed if acute upper or lower respiratory disease is present. The administration of anæsthesia in undiagnosed tuberculosis, chronic bronchitis, bronchiectasis or lung abscess may be followed by serious chest complications. In chronic bronchitis productive of abundant sputum, chest exercises and postural percussion should be supervised by a trained physiotherapist.

Oral and dental hygiene:—Attention to oral and dental hygiene is very important. Septic foci and loose teeth may make anæsthesia more risky.

Fevers and tropical diseases:—General diseases and diseases like malaria, typhoid, kala-azar and amœbic dysentery which are common in our country should be treated before operation.

Diseases of the central nervous system:—Anxiety must be allayed and sound sleep ensured. Headaches and epilepsy need medication. Worry and apprehension encourage aerophagy (air-swallowing) and abdominal distention. More serious complications like acute dilatation and paralytic ileus are also ascribed to this cause. Bowel disturbances, retention of urine and respiratory complications are believed to occur more frequently in the frightened patient. The medical attendant should do everything to win the patient's confidence.

Diseases of the urinary tract:—Urinary tract infections may accompany many gynæcological ailments. The urine should always be examined carefully for albumin, sugar and ketone bodies and in the presence of dehydration (or dechloridation) for urinary chlorides also (by some simple test such as Fantus'). The urinary tract should be investigated. Many gynæcologists will endorse John Howkin's belief (*personal communication*) that intravenous urography is an essential investigation in proccidentia and lesser degrees of prolapse. Not only does it outline the ureters but it reflects also on renal efficiency. A blood-urea estimation should be made. In urinary

infections, bacteriological studies to identify the organism and determine its sensitivity to drugs should be followed by adequate chemotherapy to control the infection, before operation. In many acute emergencies, like septic abortion and accidental hæmorrhage, a renal failure (bilateral cortical necrosis or lower nephron nephrosis) may result (Sheehan)[5]. An operation on top of this may be fatal. Gynæcological cancers *e.g.*, cancer of the cervix may infiltrate and then ulcerate into the bladder (vesico-vaginal fistula) or strangle the ureter of either side producing a hydro- or pyo-nephrosis and impair renal efficiency.

Endocrine diseases:—Endocrine ailments may need special pre-operative preparation. The control of thyrotoxicosis by sedation, iodine and/or thiouracil and the stabilization of diabetes by diet and insulin are important measures, if fatality from a thyroid crisis or a diabetic coma is to be averted. In myxœdema a course of preoperative thyroid therapy is very beneficial and Addison's disease needs special attention to electrolyte balance.

Obesity:—The obese should be respected. Venous thrombosis, pulmonary embolism, atelectasis and other chest complications, infection and rupture of the abdominal wound (fat is more prone to harbour infections and slow to heal) are all more common in fat people. The anæsthetist has also to face problems, for more anæsthetic reagent is needed to saturate the tissues of the stout and an airway is difficult to maintain without endotracheal intubation. An attempt should be made to reduce fat by dieting and Dexedrine but usually the results are not striking. A fat lady has a flabby heart and she may succumb to anoxia.

Age:—Age is not a contra-indication to operation or anæsthesia, provided the cardio-respiratory and renal reserves are adequate. The aged are not resilient and cannot easily adapt themselves so well as the young, to sudden disturbances in their body physiology. They tolerate shock and anoxia badly. Degenerative disease like coronary insufficiency may be silent and kill suddenly. Senile skin heals slowly. The aged are most prone to post-operative chest complications and to venous thrombosis.

Water and electrolyte balance[6]:—Modern surgeons appreciate the importance of correcting dehydration and replacing the electrolytes which are lacking. In operations of the magnitude of total pelvic exenterations a team of skilled biochemists are at hand to determine what electrolytes are lacking and to replace them. By electrocardiographic studies they are able to recognise potassium deficiency in time and correct it, because hypo-potassæmia kills by cardiac arrest.

It is impossible to do justice to such a vast and important subject within the short compass of this article. However any discussion of pre-operative and post-operative care will be

incomplete without a brief survey of the basic principles. Not drinking enough water or difficulty in swallowing results in pure water depletion. Electrolyte loss results from continuous therapeutic gastric aspiration, profuse sweating (as in tropical climates) aggravated by the use of too many blankets. Correct and prompt treatment may be life-saving. Incorrect and misguided treatment may kill and so it is important to know if the patient requires rehydration or restoration of electrolytes. Distinction between the two types is based on the clinical picture as well as on the findings from special tests, the simplest being Fantus' test* for estimating urinary chlorides. The following table is After Marriott.

Table I

Showing the comparison of the effects of water and salt depletion (After Marriott)

Manifestation	Pure water depletion	Pure salt depletion
Dehydration	+ + + primary or simple	+ + + secondary or extracellular
Thirst	+ + +	Absent
Lassitude	+	+ + +
Orthostatic fainting	Absent till late	+ + +
Urine volume	Scanty	Normal till late
NaCl in urine	Often +	Always absent except in Addison's disease
Vomiting	Absent	May be + + +
Cramps	Absent	May be + + +
Blood-pressure	Normal till late	Fall + + +
Plasma NaCl	Slight increase or normal	Diminished + + +
Plasma volume	Normal till late	Decreased + + +
Blood urea	+	+ + +
Hæmoconcentration	Not till late and slight	Increased + + +
Blood viscosity	Normal till late	Increased + + +
Water absorption	Rapid	Slow
Mode of death	Uncertain : due to rise of osmotic pressure ?	Peripheral circulatory failure

* Test for urinary chloride—Fantus (1936).

Technique of the test:—To 10 drops of urine one drop of 20% Pot. chromate solution (indicator) is added. A solution of 2·9% silver nitrate solution is added drop by drop until the end-point is reached which is indicated by a sharp colour change from yellow to reddish-brown. The number of drops is expressed as the concentration of chloride in urine g/litre sodium chloride. Less than 3 g/litre suggests that saline must be given.

The selection of the fluid and the quantity to be administered depend on the severity of dehydration or dechloridation. Enough

fluid must be given to restore the balance (as seen by the disappearance of evidence of dehydration) and to maintain it. Measurement of urine output must be made every 8 hours and it must be at least 20 ozs. (570 cc.). The chloride concentration must not be less than 3 to 5 g/litre as judged by Fantus' test. Normal daily requirements of 5 pints of water and 5 g. of salt must be provided, the electrolytes lost as excretions estimated and replaced. A fluid intake-output chart should be maintained. Appreciable dehydration is usually corrected by the administration of $\frac{N}{2}$ saline and $\frac{N}{2}$ glucose mixtures intravenously. This is safe; for urgent restoration of salt depletion the use of isotonic saline is permissible. The rate of infusion is usually 1 litre in the first hour, 2 litres in the next three hours, and 1 litre eighth-hourly until the normal balance is established. In the presence of cardiovascular, respiratory and renal disease and cachectic states and in a patient with hypo-proteinæmia and anæmia, constant watch must be kept on lung bases for early evidence of pulmonary congestion, as such patients are prone to develop œdema.

Shock:—Our knowledge of the physiology of shock is incomplete. Selye defines shock as a condition of suddenly developing systemic damage. Preventive and therapeutic measures to combat shock demands a knowledge of conditions which predispose to it, *viz.*, malnutrition (hypoproteinæmia), vitamin deficiency states, anæmia (from blood loss, sepsis or deficiency of essential factors) and dehydration. All these require pre-operative attention.

Surgical technique and judgement:—Skilled technique based on sound surgical principles prevents shock. "Dexterity and gentleness are two of the essentials in good surgical technique and they may be acquired in a comparatively short time by hands that have the natural aptitude. But technique without judgement is naught and judgement can only be acquired slowly and with infinite pains" says Geoffrey Keynes (Surgical aphorisms, *St. Barth. Hosp. Journal*, *40*: 187–207, 1933). Tissues should be handled delicately. Tugging and pulling of structures like the sensitive peritoneum are to be strongly deprecated. Light manageable instruments have been designed by plastic surgeons like Sir Harold Gillies and Sir Archibald McIndoe and these are gradually replacing some of the heavy unwieldy instruments hitherto used in gynæcological surgery. Operations should not be unduly prolonged. Yet "speed in surgical operation depends not on quick movements but on the absence of unnecessary movements" (Geoffrey Keynes). The traumatization of tissues by stretching and the use of heavy and cumbersome retractors to obtain adequate exposure can be eliminated by suitably planned incisions and expert anæsthesia employing relaxant drugs. There is no gentler retractor than an intelligent assistant's trained hand. Prolonged exposure of abdominal viscera, failure to keep them moist and covered with gauze wrung out in warm saline, traction or pressure on bowels are all avoidable errors which increase shock.

The expert anæsthetist by securing relaxation, correcting dehydration, replacing lost blood, ensuring a reliable supply of oxygen along with anæsthetic gases (by endotracheal intubation if necessary) and the timely use of modern resuscitative procedures can do much to eliminate shock. He may also make a small but valuable contribution by discouraging tired surgeons or interested spectators from leaning on the unconscious patient. Meticulous hæmostasis is ensured by using warm gauze packs to arrest capillary ooze and the prompt identification of bleeding points and efficient ligature of blood vessels. It is said of the celebrated surgeon James Syme that he never wasted a word, a drop of ink or a drop of blood. Likewise, the prevention of unnecessary blood-loss prevents shock. Delayed shock in the post-operative period requires early recognition and prompt treatment. The diagnosis and treatment of shock will be elaborated under "post-operative management."

Prevention of venous thrombosis:—Pre-operative measures to reduce the risk of venous thrombosis after operation consist of preventing prolonged inactivity in bed without leg exercises, the recognition and treatment of faults in the blood-clotting mechanism and the correction of hypo-proteinæmia. Suspicious cases call for a full hæmotological examination. The use of a hard pillow or support to the calves must be avoided as they may cause phlebothrombosis and as a result, pulmonary embolism.

Pregnancy:—Pregnancy must always be considered when operating on a female. Where practicable the operation should take place between the 16th and 24th weeks, as during this time the risk of precipitating a miscarriage or premature labour is minimal.

Infections:—The eloquent advocacy for cleanliness by Semmelweiss, the institution of asepsis by Pasteur and antisepsis by Lister, the widespread use of sulphonamides based on the work of Domaghk, the inauguration of the era of antibiotics with the discovery of Penicillin by the late Sir Alexander Fleming and its application to clinical practice by Florey, Chain and others have almost eradicated the mortality and considerably reduced the morbidity resulting from sepsis. Yet the possession of such powerful therapeutic agents in Penicillin, Streptomycin and Aureomycin should not blind us to the importance of maintaining a high standard of asepsis in our practice, or tempt us to short-circuit the elaborate ritual in the theatre designed to prevent the access of organisms into the wound. From time to time one encounters a patient who is completely irresponsive to these antibiotics because she has become infected by a resistant strain of an organism. Such a patient dies of a fulminating infection while the surgeon is condemned to stand by, maintaining a hopeless and infructuous vigil! In gynæcological lesions where sepsis is present either as inflammatory lesions (*e.g.*,

pyosalpinx, infected proccidentia, or tuberculous tubes) or as a secondary infection in neoplasms such as a sloughing necrotic submucous fibroid, or an endocervical cancer, the prophylactic use of antibiotics before and during operation has a place. The indiscriminate and inadequate use of antibiotics is both unjustifiable and harmful. Genito-urinary infections *e.g.*, cystitis, pyelonephritis, or an infected vesico-vaginal fistula must be brought under control before operation. Endo-uterine operative manipulations in septic abortion unless it be restricted to remove the conceptus from the cervix to arrest hæmorrhage is to be heartily condemned, unless the infection is first controlled (Stallworthy)[1].

Pre-operative preparation of the abdomen and vagina:—The pre-operative preparation of the abdomen is a well-accepted practice—soap and water cleansing, lathering and shaving is followed by thorough cleansing with a bacteriostatic lotion such as Cetavlon or other similar preparation. The area is covered by sterile gauze and a sterile towel both held in place by suitable bandaging.

Where there is a likelihood of the vagina being opened at an operation as in total hysterectomy or the peritoneum is likely to be opened in vaginal operation such as repair of a Douglas pouch hernia (enterocele) or vaginal hysterectomy, pre-operative vaginal toilet is essential. Dettol 1 : 100 solution may be used and prior to operation the liberal painting of the vagina with Bonney's blue dye not only renders the vaginal mucosa more sterile but helps one to identify it per abdomen because it is stained.

Immediate pre-operative preparation:—As already suggested it is advisable to admit the patient 16 to 48 hours before operation during which measures are instituted to prepare her for the operation. She is put on a light but nutritious diet with abundance of vitamins, especially B complex and C. Anxiety must be allayed and premedication given according to the anæsthetist's wish. The patient must have sound sleep. Attention must be given to the bowels by allowing normal soft motions and preventing constipation. but violent pre-operative purgations have no place in modern medicine. Deep-breathing exercises are advised. The bladder must be empty before the patient goes into the theatre. As outlined the abdominal wall and vulvo-vaginal area receive pre-operative toilet. Consent for operation and anæsthesia must be affixed to the complete case notes with all charts *e.g.* fluid intake-output, X-rays etc. The exact time and the dose of the pre-medication must be entered in the notes along with the name of the person who gave it. False teeth or dentures must be removed and under no circumstances should a patient be sent to the theatre with a stomach that is *not* empty. Where there has been repeated vomiting or in obstetric emergencies when there is delay in gastric emptying time and diminution of intestinal mobility, a Ryle's tube must be left in the stomach and freqnent aspiration done with a

syringe. In such cases cautious intubation by an expert anæsthetist employing an endotracheal cuff may add to the safety of the patient.

The modern operation should be looked upon as an incident, no doubt an important one, in the general management of the patient where skilled pre-operative preparation and post-operative supervision are of far greater importance than even dextrous surgery.

Post-operative management and complications.—*Immediate post-operative management*:—The post-operative period commences as soon as the last stitch is in. From the theatre table to the warmth of the ward bed, especially if they are some distance apart, is a perilous journey fraught with dangers. Unskilled attendants like porters may decide to push the trolley with the patient's head-end elevated, intravenous drips may slip out of veins raising subcutaneous swellings, the mechanical airway may become dislodged causing the tongue to fall back and obstruct and finally the patient may be roughly tossed on to the bed. All these are shocking but not unknown occurrences. The blockage of the airway by the patient's saliva, the aspiration of vomitus into the respiratory tract as the patient comes round, excessive sweating and discomfort from blankets piled on the patient, abduction palsies which result from malposition of the limbs, and hot-water-bottle burns and basal congestion of lungs from careless nursing during unconsciousness, are all hazards which should be prevented. In order to enable a high degree of skilled care and constant supervision to be given, the modern demand for suitable recovery rooms close to the theatre has grown, rooms like those at the very modern Plastic and Facio-Maxillary Unit under the direction of Sir Archibald McIndoe of Queen's Hospital, East Grinstead.

Late post-operative care:—The object of post-operative care is mainly to make certain that the disturbance to the body caused by operation is overcome as quickly as possible and an active supervision is maintained to prevent the occurrence of complications. It is really a continuation of the care given during the pre-operative period and during the operation.

The fluid and electrolyte balance must be maintained. Blood lost at the operation needs to be replaced. The technique of collecting blood and examining it to exclude communicable diseases (like syphilis, malaria, jaundice), grouping and cross-matching and administration to a patient needing it, has now grown to be almost a separate science. One must be aware of the dangers of a carelessly administered blood-transfusion and know how to put up a drip-set with aseptic precautions and skill. The prevention of air embolism and of overloading the circulation, the early recognition of transfusion reactions and their prompt treatment and a clear understanding of the basic principles of grouping and cross-

matching (including the Rhesus factor which has lately come into prominence) are all of inestimable value to the medical attendant.

After the initial period during which a Trendelenberg position (head down and feet elevated) is preferred, the patient must be encouraged and helped to alter her position from side to side and to start early ambulation. These are valuable measures to lessen the risk of hypostatic pulmonary congestion and venous thrombosis of the calves followed by pulmonary embolism. The patient must be made to cough up any mucus from her throat and the abdominal wound may be supported to lessen pain. Deep breathing to secure full æration of all parts of the lungs must be well taught by a keen physiotherapist. This prevents atelectasis which is a well-known danger in using relaxants in anæsthesia.

The abdominal or vaginal wound should be cared for. Attention to asepsis, the avoidance of hæmatoma, and the exact apposition of the skin or mucosal edges, all discourage wound sepsis and promote rapid healing. Careful repair of the abdominal wall in layers, prevents burst abdomens. The use of Michael's clips are viewed with disfavour by plastic surgeons who claim that the exact apposition of the skin and the prevention of subcutaneous hæmotomas can be secured only by meticulous suturing with silk or nylon. Clips cause ischæmia of the epithelium in wound edges and may become dislodged if the patient is restless or the nursing staff careless.

Post-operative complications:—Only morphia can allay the restlessness and pain following major abdominal or vaginal operations.

The prevention of shock has already been discussed. When it occurs, it can be diagnosed by the cold and clammy appearance of the patient, pallor of the face, a thin rapid pulse, cold cyanotic extremities and a low systolic blood-pressure, possibly with sighing respirations. It requires urgent treatment by the intravenous administration of plasma substitutes (*e.g.*, synthetic polysaccharide solutions like Dextran or Plasmosan) or better still by blood.

The administration of oxygen must not be by a single nasal catheter reluctantly connected to an old oxygen cylinder at a time when the patient is almost dead (which according to Prof. R. V. Christie is a wasteful and ineffective method satisfying the conscience of the medical attendant) but by the early use of an efficient B.L.B. mask to provide oxygen at the rate of 6 to 8 litres per minute as judged from the reading on the flow-meter attached to the cylinder. The foot of the bed must be elevated and the patient must be kept warm, not unduly hot.

Diet:—After abdominal operations it is customary to give sips of water only for the first twelve hours and liquids for the next twentyfour. A light but nourishing diet may be commenced as soon as the bowels have begun to move. The patient may not take much and while it is important to give nutritious food it is not wrong to cater to the patient's desires up to a point. The addition of vitamin supplements, B complex and C (the last is believed to stimulate wound-healing) is beneficial.

Oral sepsis and parotitis:—Attention to oral cleanliness is an essential nursing routine, as failure may result in the development of parotitis.

Vomiting:—Post-operative vomiting is not an unusual complication, and it is not serious provided it does not occur when the patient is just recovering from anæsthesia and her protective reflexes are still depressed, or as a result of intestinal obstruction due to catching up of a loop of the bowel in the peritoneal closure.

Hiccoughs:—Hiccoughs are not uncommon in the post-operative period. As long as it is not due to uræmia, acute dilatation of the stomach, paralytic ileus or peritonitis it is not a serious, complication and disappears spontaneously. Carminative mixtures, subcutaneous injection of pethidine or hyoscine 1/150—1/100 grain are sometimes useful in stopping it. Exceptionally, rare intractable hiccoughs may demand a phrenic crush.

Acute dilatation of the stomach:—Acute dilatation of the stomach if recognised and treated early is serious enough, but when not diagnosed often proves fatal.

Fæcal fistulas:—Fæcal fistulas are rare complications of gynæcological operations where the bowel is not opened, and requires special management when they occur.

Abdominal distention and wind:—Gaseous distention of the bowels may be relieved by the use of a flatus tube. After abdominal operation the bowels must be kept soft. This is very important in vaginal repair operations, more so when a posterior colporrhaphy or perineorrhaphy has been performed. Otherwise the hard stool may tear and infect the wound. A soap and water enema may be given 48 hours after the operation followed by a mild laxative. Half an ounce of liquid paraffin may be given twice daily to keep the fæces soft. A soap and water enema may be repeated on the 5th day. Sluggishness of the bowel and fæcal impactions must be prevented and when they occur must be recognised early and treated promptly.

Paralytic ileus:—In this complication usually occurring in peritonitis the bowels are paralysed and distended. Continuous aspiration of the stomach and small intestines must be combined with correction of dehydration and electrolyte balance, and sedation of the patient with morphia. Oral feeds should not be given until signs of bowel activity (like bowel sounds on auscultation) are recognised.

Intestinal obstruction:—This is an important complication which may occur on some days or weeks after operation. Aspiration of

the stomach and intravenous therapy to correct dehydration should be started. Cautious, expert anæsthesia must precede laparotomy which should be performed to discover and remove the cause.

Retention of urine :—Often patients experience great difficulty in passing urine particularly after operation on the pelvic viscera. It is indeed very easy to overcome this complication by inserting a catheter but it is better to wait for 20 hours before doing anything, after which simple measures, such as reassurance, encouragement, change of posture and a warm perineal bath should all be tried. Then as a last resort the subcutaneous injection of ½ cc. of acetyl choline (carbachol) may be tried and repeated after an hour if necessary before using a soft catheter. The decision to catheterize must always be taken with reluctance. The procedure itself must be carried out under strict aseptic precautions. It is easier to prevent an urinary infection than to cure it when it is established. After operations, as on the anterior vaginal wall (colporrhaphy) or when the vagina has been tightly packed with gauze, an indwelling catheter is usually left behind; the open end is closed with a spigot, which should be released every 6 hours and the catheter itself removed by the sixth day. Prophylactic therapy with urinary antiseptics *e.g.*, mandelic acid or sulphonamide therapy will be useful. It is well to keep a close watch on the urine for evidence of infection or diminution in output for this may be the earliest evidence of renal failure. While sulphonamide therapy is being given an alkaline diuretic mixture may also be prescribed.

Anuria :—Some of the sulphonamides are apt, when the urine output is diminished, to crystallize out and obstruct the tubules and cause oliguria and then anuria. Lower nephron nephrosis and bilateral cortical necrosis should also be considered when anuria occurs. The treatment of anuria, when established, has been discussed at length by Bull Joekes and Bywaters in their papers [9 10] which may be consulted for details of treatment; their method has been widely accepted. An out-moded procedure like decapsulation only adds insult to the injured kidneys.

Venous thrombosis :—Venous thrombosis may follow any operation, particularly in the pelvis. On the basis of the ætiology, clinical, prognostic and therapeutic grounds, two varieties are recognised *viz.*, thrombophlebitis and phlebothrombosis.

(1) *Thrombophlebitis* :—In thrombophlebitis there is inflammation within the vein and the clot is white or mixed and adherent to the vessel unless it suppurates and liquefies. There is redness, heat, pain and tenderness along the vein which may be palpated, as a thickened cord. There may be fever. This is the condition which, when severe, produces a white leg. It is not fatal but is a potent cause of chronic disability and morbidity. The treatment is essentially conservative and the response to chemotherapeutic and antibiotic drugs is satisfactory.

(2) *Phlebothrombosis* :—Phlebothrombosis on the other hand is more silent and sinister. The thrombus is red and only loosely attached to the vein-wall. It may become detached at any time and be swept along the veins into the pulmonary artery which it may block and produce pulmonary embolism. Tenderness in the calf may be complained of but sometimes the onset of pulmonary embolism may be the first presenting feature. The relative silence with which thrombosis occurs must make the surgeon keep a sharp look-out for this complication. Pain in the calf on dorsiflexion of the foot (Homan's sign) if elicited, must be treated seriously. A rise in temperature around the 10th day is suggestive. Massive pulmonary embolism is dramatic in its onset. The patient sits up on the tenth day asks for a bed-pan, suffers from a sudden bout of hæmoptysis and falls back dead. So dramatic is it that we are apt to forget that lesser forms occur which may go unrecognised until some complication results, such as, chest pain, pleurisy, an abscess or a segmental pneumonia. Phlebothrombosis starts most commonly in the deep veins of the calf but sometimes also in the femoral veins. Protracted bed-rest and prolonged immobilization must be avoided. Pressure on the calf muscles must not be allowed to occur while the patient is on the operating table. Active leg exercises and early ambulation are essential preventive measures.

Anticoagulant therapy :—Once phlebothrombosis is suspected the treatment is by anticoagulant drugs. To be effective Heparin injections are followed by maintenance doses of Dicumarol or Tromexan, the dose being regulated according to prothrombin estimations on blood carried out at intervals. The place of prophylactic ligation of veins (superficial femorals) and in some cases even of the inferior vena cava is not yet fully established, though good results are claimed.

Post-operative pyrexia :—There is considerable reparative activity in the body and a reactive pyrexia consisting of. a temperature of about 101°F may follow operations, which usually falls by lysis on the 3rd or 4th day. A high temperature 104°F within 12 hours accompanied by rigors generally means a septicæmia. A secondary rise during the convalescence may be due to an abscess formation somewhere (wound or pelvic abscess), a urinary infection, peritonitis or late venous thrombosis.

Wound :—The less the wound is looked at and messed about, the sooner it heals. During change of dressings also, strict aseptic technique should be used. While early ambulation is desirable there should be no strain on the wound. Fine stitches to skin edges should be removed within 2 to 3 days, nylon tension sutures within 8 to 10 days. Skin ulcers result from tight tying of ligatures. Drains serve a useful purpose for 48 hours. After that, if they are not actively functioning, they must be removed, lest they permit the entry of infective organisms.

Delayed hæmorrhage may occur from necrotic sloughs separating. Re-ligation of a blood vessel may be required.

Chest complications:—Pneumonia, pleurisy, massive collapse and pulmonary embolism are all common complications which may follow operation—with effective preventive measures on lines already indicated, by early diagnosis and prompt efficient treatment, their incidence may be lowered and morbidity resulting therefrom reduced.

The post-operative management of in-operable malignant diseases:—Sir Geoffrey Keynes of St. Bartholomew's Hospital, London used to impress on his students, that surgery which does not cure is not by any means surgery, that has failed. Some of surgery's greatest triumphs are obtained in the field of palliation. The formidable operation of pelvic exenteration with which we began this article is often a palliative one to relieve distress and pain.

How often do we encounter gynæcological cancers for which we attempt no more than a palliative excision or the removal of a piece of tissue for pathological study? Our attitude towards these patients should not be to get them out of hospital quickly so that they suffer, cruelly deprived of the skilful care, medical nursing can give and cause great distress to their relatives. Instead we must comfort and encourage and where medication with morphia (Brompton's mixture) fails, modern surgical advance offers a valuable and effective method of abolishing the intractable pain of advanced malignant disease in the operations of anterolateral cordotomy, intrathecal alcohol injection and finally prefrontal leucotomy.

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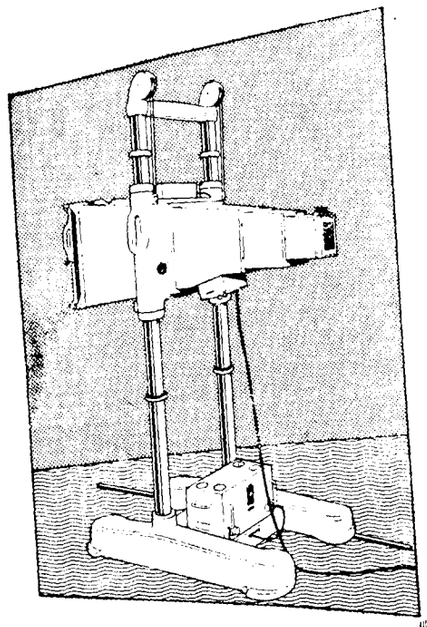

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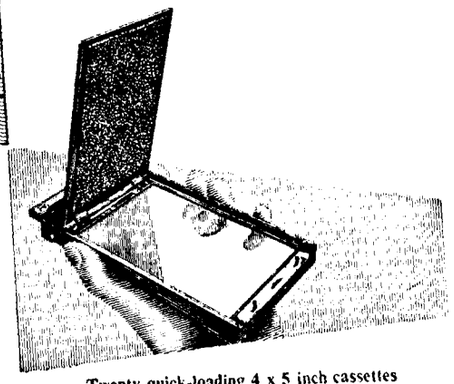

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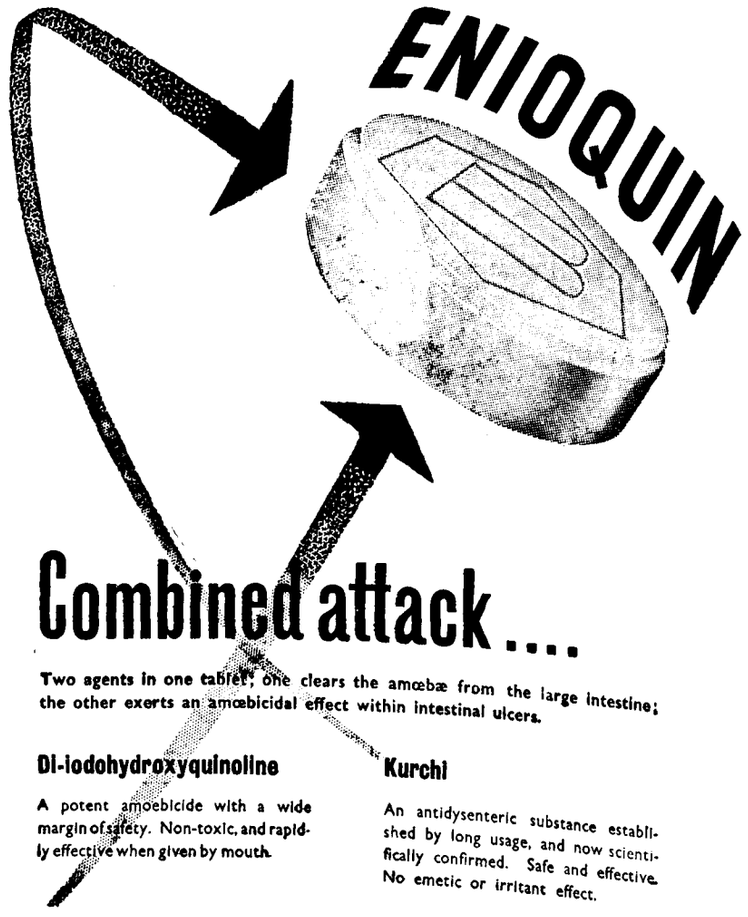

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OBSTETRICAL EMERGENCIES AND THEIR MANAGEMENT

(Reports of Cases Treated at the Civil Hospital, Rajpipla Between July 1951 and March 1953)

CAPT. N. R. DANI, M.B., B.S. (BMS II cl.),
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I. Placenta praevia.—Four cases were treated by me during the period noted above, three by cæsarean section, and one by internal podalic version, bringing the foot down.

It is recommended that vaginal examination be done in the operation theatre and facilities got ready for transfusion of 1000 to 1500 cc. of blood as also glucose saline to be started at any moment. 'In central and partial placenta prævia, even a very careful vaginal examination may initiate profuse hæmorrhage, requiring immediate action by way of manually emptying the uterus of its contents—child, placenta, blood and blood clots—in order to control the hæmorrhage effectively and save the life of the patient. In such cases blood transfusion under pressure should be promptly instituted. In the civil hospital here, in which these cases were treated, blood donors were *not* available. The vaginal examinations were usually done by the lady doctor and whenever necessary also by me to ascertain the extent of dilatation of the cervix and if the placenta was central, partial or marginal, without exerting any pressure.

Cæsarean section was done in all the 3 cases of placenta prævia, lower segment sections in two, and the classical section in one. Two of the 3 cases were in a bad condition, markedly exsanguinised even prior to admission. Blood donors could not be had. The pulse rate in one case was 144 per minute, before being taken to the theatre, and she died six hours after operation. In another case with a pulse rate of 135 per minute prior to operation, also exsanguinated, general anæsthesia was ruled out and classical cæsarean was done under local anæsthesia. She had a stormy post-operative period but luckily survived and was discharged cured a fortnight later.

In one case of marginal placenta prævia, I did an internal podalic version, and brought the foot down. She made an uneventful recovery. Though spinal anæsthesia is advocated in such cases by many obstetricians, I use only general anæsthesia with chloroform and ether or ether and local anæsthesia—for in my opinion spinal anæsthesia is attended with fatal results in some obstetric cases, even when the B.P. was normal before the operation. Thus in the

above 4 cases, general anæsthesia was used in three and local in the fourth case.

II. Accidental haemorrhage.—Three cases were treated, one by cæsarean section and two by a rupture of the membrane. All the three showed signs of toxæmia; hæmorrhage was concealed in two and partially manifest in one (external); in the latter as the cervix had not dilated even after ¼ g. of morphia, rest and waiting for 14 hours, and as the condition of the patient was deteriorating due to concealed hæmorrhage, a lower segment cæsarean section was performed. Glucose saline infusion and routine post-operative management were resorted to. The post-operative period was hectic with pyrexia for 3 weeks, which could not be explained. Penicillin and streptomycin were given from the beginning but they could not obviously control the sepsis within the uterus. Intrauterine glycerine was given on three consecutive days, followed every time by the injection of 1 cc. of pituitrin. It was possible to obtain a supply of only 8 capsules of 250 mg. of aureomycin for her, which were given every eight hours with good results and she was discharged five weeks after the operation. In two cases of concealed accidental hæmorrhage, labour was in progress, the os was more than 4½ fingers dilated, and the membranes had ruptured. One unit of pituitrin was given in both cases after the rupture of the membranes. One of these two had a fatal termination.

III. Contracted pelvis.—Five cases were treated between July 1951 and March 1953. Low forceps had to be applied in four and the classical cæsarean section was done in one, who was sterilised at the same time. In the latter case the disproportion was markedly above what is usually considered normal *viz.*, interspinous 9½"; intercristal 10½"; external conjugate 7"; and true conjugate 4¼" to 4½"; the relation between the head and the pelvis was also duly considered. The lady was delivered (by the cæsarean) of a live male child which she longed to have. The pelvic contraction was not quite so pronounced in the other 4 cases and so forceps were applied. In these cases the uterine contractions were usually feeble after prolonged labour. The chances of survival of the children in these trial labour cases are remote. Thus in one of these—a first degree case, trial labour was given, in the hope that it would be normal, but low forceps had to be ultimately applied. The child did not survive.

IV. Obstructed labour.—Accounted for 5 cases, four of which were delivered by forceps and one hy cæsarean operation. None of the five had any pelvic contraction and four satisfied all the conditions necessary for the application of the forceps *viz.*, (1) the cervix was fully dilated or easily dilatable; (2) the membranes had ruptured; (3) the head was already engaged; (4) the uterus was contracting and relaxing and (5) the bladder was emptied before the operation. One case which showed no dilatation

of the cervix for over 18 hours after rupture of the membranes, had to be delivered by lower segment cæsarean section.

V. Prolapse of hand.—3 cases, and one of prolapse of hands with prolapse of cord, were treated. Two of the three cases were given internal podalic version, and the children delivered as breech; the general condition of the third patient was bad; neglected shoulder decapitation was done; intravenous glucose saline and morphia subcutaneously were given to combat shock but she did not survive. In this case the lower uterine segment was thin, retraction ring was present and the foetus was dead.

In the fourth case with prolapse of hands and cord, evisceration through the chest wall was done; the thoracic contents were first emptied and the abdominal next; then the child was extracted. Recovery of the mother was uneventful.

VI. Retained placenta.—We have had only one case of adherent (retained) placenta, which had to be manually removed, when Crede's and Kristeller's methods proved futile.

VII. Uterine inertia.—One case of secondary uterine inertia, in which the membranes had ruptured at home was treated in hospital. Injection of ¼ g. morphia, chloral and bromide orally and glucose saline intravenously were administered. Rectum and bladder were emptied. Low forceps were applied 4 hours later when feeble uterine contractions occurred. After delivering the child and before the placenta was expelled, ½ cc. pituitrin and ½ cc. of neogynergen were injected I.M. and a similar dose after expulsion of the placenta. Luckily there was no post-partum hæmorrhage, but the post operative period was hectic, with marked meteorism due to paralytic ileus. Prostigmine and Cal. pantothenate were given, as also glucose saline I.V. The gastric contents were aspirated by a Ryle's tube. Uneventful recovery followed.

VIII. Extended breech.—In the one case we had, the breech was converted into a double footing by manipulation. The child was delivered vaginally by flexing the leg at the knee joint and manipulating it to the middle line.

IX. Face presentation.—A multipara with normal pelvic measurements had a face presenting child. Attempts at converting this presentation into normal vertex presentation having failed, podalic version was tried. Considerable difficulty was experienced in delivering the after-coming head and so craniotomy through the hard palate was done and the head extracted.

X. Postpartum haemorrhage.—In six cases we dealt with, of this condition the following routine procedure was adopted:—

Injection of ½ cc. each of neogynergen and pituitrin after delivering the child and before expulsion of the placenta and a similar dose after expulsion, was given. The uterus was massaged and tears, when present repaired. In atony, neogynergen ½ cc. was

injected I.V., and bleeding was promptly controlled, without having to resort to packing etc.

XI. Tonic uterine contraction.—Usually in such cases the fœtus is delivered by craniotomy, decapitation or embryotomy etc. In the one case treated by me, there was no relaxation, the os was only 1½ fingers dilated with no further progress in the process. I waited for 8 hours after the membranes had ruptured but still there was no progress. A lower segment cæsarean section was performed and the child delivered alive. The recovery was uneventful.

XII. Rupture of the uterus.—Occurred in a case of obstructed labour; uterine contractions were feeble, and conditions for forceps delivery were favourable. Low forceps were applied and the child was delivered. A tear in the cervix and left lower segment of the uterus was noted when examined *p.v* as the placenta had not been expelled. Luckily the triad of symptoms—pain, shock and hæmorrhage into the peritoneum—had not occurred. Labour had ceased and the placenta could not be delivered; the rupture was due to obstructed labour, in which forceps were applied. The patient was given glucose saline by I.V. drip., morphia ¼ g. and atropin sulph 1/100 g. A subtotal hysterectomy was done an hour and a half later, when she was out of shock. She did not however, survive.

XIII. Delayed persistent occipito-posterior positions.—Two such cases came under my treatment. In such cases it is desirable to wait for a couple of hours and find the position of the ear under anæsthesia, to assess the position of the head—which is often difficult. Delivery may occur spontaneously. But in both these cases, episiotomy was done and forceps applied in the same position. In one case the cervix was torn on the left side and the tear was repaired. Recovery was uneventful in the 2 cases.

My grateful thanks are due to Shri Dr. B. B. Dixit, Surgeon General with the Government of Bombay, and Sri Dr. R. H. Desai, Civil Surgeon, Broach for according permission to utilise the records of the Civil Hospital in the publication of this paper. I wish also to thank Shri R. B. Ozo, B.M.S. III Class officer, who helped me in the collection of data from the records.

PULMONARY RESECTION AND PREGNANCY

Corner *et al* of Baltimore report that lobectomy or pneumonectomy is not incompatible with subsequent pregnancy if the patient is not dyspnœic at rest or from slight exertion. Surgery may be performed during gestation with safety to mother and fœtus. Pregnancy does not cause undue respiratory strain after pulmonary resection. Single lobectomy does not produce a significant loss of lung-tissue. Symptoms of respiratory distress do not occur ordinarily when the vital capacity is lessened by loss of lung tissue and intrathoracic space, because the patient can compensate by breathing more rapidly and more regularly. Pulmonary function does not change as pregnancy progresses.—(*Am. J. Obst. Gynaecol.*, *68*: 903–915, 1954 via *Mod. Med.*, 15-12-1954).

INVERSION OF THE UTERUS

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Aetiology.—The incidence of this condition being somewhat rare we do not come across many references to it in literature. Its simple pathology and treatment might also account for this paucity. During the last ten years I have come across four cases, three of them being of the chronic and one of the acute type of inversion of the uterus. Perhaps many more of the mild type of acute inversions and some of the chronic type also escape detection as they probably set themselves right before they can be detected. In mild cases of chronic inversion which are mainly due to sessile sub-mucous fibroids, attached to the fundus, the uterus resumes its normal position, as soon as the polyp is removed, as evidenced by one of the four cases reported herein.

Signs and Symptoms:—Most of the acute cases are puerperal, due to atony of the uterine muscle and relaxation of the internal os, while other cases are due to pulling on the umbilical cord, when the placenta is still adherent or by squeezing a relaxed uterus soon after delivery. Chronic inversion of the uterus may be either late puerperal cases or those associated with the extrusion of a sub-mucous fibroid, arising from the fundus of the uterus. The pathology of the inversion of the uterus is that the fundus of the uterus gets down into the cavity first forming a cup-shaped depression on the preitoneal surface; later the tubes, round ligaments and broad ligaments are gradually drawn in and the ovaries perch on the inverted uterus. In chronic cases, inverted adhesions are formed between the walls of the uterus thus making replacement difficult. The endometrial surface in chronic inversion, is inflamed, infected and in long-standing cases is even ulcerated. A higher percentage of sarcomatous changes is found in the myoma associated with chronic inversion than in all cases of myoma. In such cases the inverted myometrium is infiltrated by the malignant growth. In acute inversion the pathology is slightly different in that the endometrium is raw and looks red with open placental sinuses, if the placenta has separated or in cases, where the placenta is in tact, the endometrium is partially covered by the placenta.

The symptomatology varies according to whether it is an acute or chronic inversion. The three cardinal points in acute inversion are:—shock, hæmorrhage and infection. In chronic inversion of the uterus the most important symptoms are intermittent lower abdominal pain combined with vaginal bleeding and infected cases there is an offensive vaginal discharge as well.

Diagnosis :—In acute inversion the triad of symptoms, mentioned above are accompanied by the sudden disappearance of the fundus of the uterus from the hand on the abdominal wall. In complete inversion the whole uterus may be found outside the vaginal outlet, completely everted. The sudden disappearance of the uterus, when palpated per abdomen, due to inversion may be mistaken for retroversion, which can however be diagnosed by palpating the uterus in the pouch of Douglas.

In chronic inversion the cup-shaped depression can sometimes be felt through the abdomen and in complete inversion the whole œdematous uterus may be felt outside the vaginal outlet. In long-standing cases it will be difficult to shove it back. Rectal examination may show the absence of the ovaries in their normal position; they will be found perching on either side of the cup shaped depression. A fibroid polyp may be mistaken for an inversion in which a simple test will reveal the real condition. If the protruding mass is pulled down with a volsellum and if the cervix moves upward, it is a case of inverted uterus, whereas if the cervix moves down along with the tumour then it is a fibroid polyp.

Treatment :—In acute inversion if the general condition of the patient is good, immediate reposition should not be resorted to; but if there is marked shock immediate reposition should not be attempted. The shock should be treated first and then the reposition done. Reposition of an inverted uterus itself causes shock to the patient. When the placenta has already separated, this line of treatment may be followed. If the placenta is in tact at the time of inversion, the problem arises whether it should be separated before the uterus is replaced or if the uterus should be replaced before the placenta is manually removed. If there is no hæmorrhage and if the general condition of the patient is good, then either procedure may be adopted. The replacement of the uterus with the placenta in tact may be more difficult; and according to Sheehan, the longer the placenta remains in the uterine cavity, the greater will be the degree of shock. But, if the placenta is first removed and if there is hæmorrhage it will be difficult to control the bleeding when the uterus is inverted and so we prefer the first method. If the placenta is in tact and there is severe hæmorrhage, then the placenta may be removed, the uterus then replaced and the hæmorrhage controlled.

In cases of severe shock and hæmorrhage, immediate replacement will increase the mortality rate. Hence the shock is first treated and the vagina is packed to arrest the hæmorrhage. If the patient recovers from the shock, within 25 hours after the inversion the abdominal route for delivery by Huntington's method may be attempted.

The third cardinal symptom of infection may be combated with antibiotics.

In the treatment of chronic inversion of the uterus, there are three lines of approach : In a very small percentage of cases the uterus gets replaced automatically when the cause (a sub-mucous fibroid polyp) is removed. Wilfred Shaw found that in the majority of cases, after removal of the cause, Aveling's repositor gave successful results. In a still small percentage of cases, surgery will be required. Either abdominal (Haultain's or Dobbin's method) or vaginal (Spinelli or Kustner method) mode of reposition may be done. Shaw is of the opinion that inversion caused by fundal myomata should be treated by hysterectomy by the vaginal route.

Case reports.—Case 1.—*Acute inversion* :—A multipara, with previous natural deliveries, was delivered this time with forceps. It was a case of reversed rotation of the occiput with relaxed perineum resulting in prolonged labour and fœtal distress. As soon as the child was delivered, the placenta was expressed by Crede's method. Perhaps it was done when the uterus was still relaxed. With the expression of the placenta there was severe post-partum hæmorrhage and the uterus had slipped from the hand on the abdominal wall. So with due aseptic precautions a vaginal examination was made to see whether the uterus was retroverted or inverted. The pouch of Douglas was empty and the uterus was found incompletely inverted. As the general condition of the patient was good, the inverted uterus was immediately replaced and oxytocics were given to encourage uterine contractions. The post-partum hæmorrhage was completely controlled. There was mild shock after replacement of the uterus. The usual measures, such as blood transfusion and sedation, to combat shock were adopted. Prophylactic antibiotics were given during the puerperium which was afebrile. The mother and child were discharged cured about the tenth day.

This was a case of acute puerperal incomplete inversion, recognised and replaced immediately as the condition of the patient was good. The resultant mild shock was treated, the hæmorrhage controlled and infection prevented by antibiotics.

Case 2.—*Chronic inversion* :—Mrs. G., aged 45 was admitted on 16-2-'53 with a history of dirty, foul-smelling vaginal discharge of 25 days' duration. She had given birth to ten children only three of whom were alive; the last child was born 5½ years ago.

Menstrual history :—She attained puberty at the age of 13 and had regular but scanty periods till 3 months ago. A month ago she had profuse bleeding following two months' amenorrhœa. She had no dysmenorrhœa at any time.

Present history :—The profuse period was followed by a dirty foul-smelling discharge. There was no abdominal pain. She had no fever. The bowels were regular and micturition normal. She was referred to us from a mofussil hospital as a case of cancer of the cervix.

General condition:—The patient was very anæmic but there was no œdema anywhere. The cardiovascular, respiratory and digestive systems were all normal.

Vaginal examination:—The vulva was healthy looking but a profuse foul-smelling discharge was coming per vaginum; a soft mass was protruding through the external os and the rim of the cervix was felt all around the mass.

Speculum examination:—A fungating sessile mass, arising from the fundus of the uterus filled the vagina. The uterus was incompletely inverted and the cavity was very shallow.

Laboratory report:—Hb. was 31%, Kahn test was negative and the urine was clear.

Treatment:—The anæmia was treated by blood transfusions and iron therapy. The general condition was built-up. A biopsy of the growth showed a necrosing myoma.

When the general condition improved the fibroid polyp was excised piecemeal under general anæsthesia taking care not to injure the inverted uterine wall. The endometrium was unhealthy. The uterus and vagina were loosely packed with antiseptic gauze for a few hours to prevent hæmorrhage.

Antibiotics and local antiseptic treatment were given. The inversion corrected itself and the vaginal discharge became healthy. She was running irregular temperature, which soon subsided and her hæmoglobin percentage rose satisfactorily. She was discharged cured a month later.

Case 3.—(*Chronic*):—Mrs. S., aged 21 was admitted on 7-6-1951 with a history of irregular vaginal bleeding of 6 months' duration.

Social history:—She was a poor illiterate woman living with her husband and children. She had 3 children, two of whom were alive and the last child was 6 months old.

Menstrual history:—She attained puberty at the age of 13 and was menstruating regularly and normally. Now she had irregular and painless vaginal bleeding since the last child-birth.

Present history:—The present complaint dated back to the last child birth, which was a natural delivery conducted by untrained nurses. She was nursing her child. She had no fever but her appetite was poor, her bowels were regular and micturition was normal.

General condition:—She was a thin emaciated, anæmic individual; her tongue was clean and throat was clear A hæmic murmur was present in the heart. Her lungs were clear and nothing abnormal was detected in the abdomen.

Vaginal examination:—The vulva looked healthy; and the vagina was moist with a slightly offensive reddish discharge. The uterus

was inverted, the rim of the cervix was felt all round the inverted fundus of the uterus and the uterine cavity was shallow.

Speculum examination:—The inverted uterine surface was covered with raw red endometrium in some and necrosing material in other places. A blood-stained discharge was wetting the vaginal mucous membrane.

Laboratory report:—Hb. was 35%. Kahn test was negative and the urine was clear.

Treatment:—When the general condition and the Hb. improved, the uterus was replaced by Dobbin's method. Double salpingectomy was done as the patient wanted sterilisation to be done. To prevent the uterus from falling back into the pouch of Douglas or from inversion recurring, a ventral fixation was done. Antibiotics were given as a prophylactic measure; she had a smooth convalescence and was discharged cured about a month later.

This was a case of puerperal chronic inversion. The history dated back to her last child birth and there was vaginal bleeding since then. As we did not have Aveling's repositor, we had to resort to surgical measures.

Case 4.—(*Chronic*):—Mrs. L., aged 19, was admitted on 21-8-'52 with profuse vaginal bleeding of 25 days' duration.

Social history:—She was an illiterate poor woman, married 2 years ago and living with her husband. She had no pregnancies so far.

Menstrual history:—She attained puberty in her 13th year. Periods had been regular and normal in quantity, till three months ago. She used to get mild dysmenorrhœa once in a way.

In the past three months, her periods had been coming on frequently, once in 10 or 11 days and lasting for 4 or 5 days. The last period started 25 days ago and was still continuing.

Present history:—The vaginal discharge became offensive 5 days after its onset. This was accompanied by fever and chills. She had no cough or cold. She complained of frequency of micturition and dysuria. Her bowels were regular.

General condition:—She was emaciated and anæmic. Her tongue was clean and her throat was clear. A hæmic murmur was present, and her lungs were clear. A small non-tender mass was palpable in the supra-pubic region of the abdomen with a cup-shaped depression on the top of it.

Vaginal examination:—The vulva looked healthy; a fungating mass was filling the vagina. The rim of the cervix was felt all round the mass, but receded when the mass was pulled down.

Speculum examination:—Revealed a fungating mass arising from the uterine fundus and protruding through the external os. The uterine fundus was partially inverted and the cavity was shallow.

Rectal examination:—The same mass was felt also per rectum; the fundus of the uterus was not found in its original place and the ovaries were felt perched on the uterus.

Laboratory report:—Hb. was 55% and total W.B.C. was 7800/cm; Kahn test was negative. The urine showed albumin and pus cells.

Treatment:—Antibiotics and iron therapy were given, as also urinary antiseptics. The general condition of the patient was built-up. Biopsy of the growth showed a picture of fibro-myoma. The growth was excised piecemeal per vaginum and local treatment was given to clear the sepsis. When the endometrium appeared sufficiently healthy, the uterus was replaced abdominally by Dobbin's method. The tubes and ovaries were normal. A ventral fixation was also done to prevent recurrence. The patient had an uneventful recovery and was discharged cured. She reported periodically in the out-patient department. She had regular monthly periods and the tubes were found to be patent (Rubin's test).

My grateful thanks are due to the Medical Superintendent of this hospital Dr. H.S. Thomas, for according permission to publish this report.

BOOKS RECEIVED

Medical Digest (Pathology Number) Feb. '55. 90 pages. Medical Digest, Opera House, Bombay 4. Price Rs. 2/-.

Review of Medical Microbiology, 1954—By Earnest Jawetz, Joseph L. Melnick and Edward A. Adelberg, Lange Medical Publications, California. 360 pages. Sole Distributors, M/s. Kothari Book Depot, King Edward Road, Parel, Bombay. Price Rs. 18/-.

Handbook of Medical Treatment—Fourth Edition, 1954, Lange Medical Publications, California. pp. 569. Sole Distributors M/s. Kothari Book Depot, King Edward Road, Parel, Bombay. Price Rs. 14/-.

The Shoulder and Environs—By James E. Bateman, 1955, Pp. 565, The C. V. Mosby Company. St. Louis.

World Congress of Doctors for the Study of Present Day Living Conditions—Reports and Proceedings.

NEWS AND NOTES

Drive Against the Manufacture and Sale of Spurious Drugs in Bombay

During January 1955 convictions were obtained in various courts of law in the cases handled by the Anti-Corruption and Prohibition Intelligence Force.

CORRIGENDA

1. (*a*) Antiseptic, March 1955: p. 169, insert '*not*' before "*due*" in the fist line of para 6; and

(*b*) p. 173, for "*patches*" in line 41 read '*vesicles.*'

2. For "Serpina" in *the penultimate* line of the concluding para on p. 189 of the March 1955 issue, please read "Rauwolfia Serpentina."

3. The words "*firm* continent to continent" in line 24 on page 239 of the March 1955 issue of the Antiseptic, should read "*from* continent to continent."

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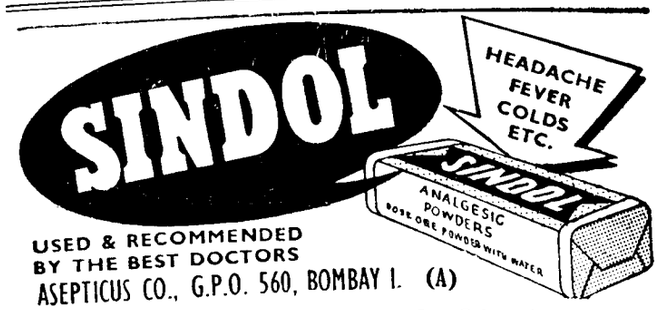

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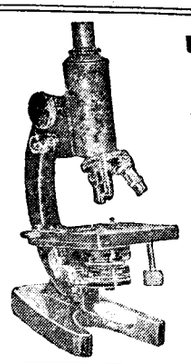

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References:-
1. **"The Role of Ayurvedic Medicines in the Treatment of Diabetes Mellitus"**—Indian Journal of Medical Sciences-Vol. 6, No. 2, Feb. 1952, pp-117-130.
2. **"Review of Diabetic Cases Treated with Ayurvedic Medicines"** "Special Therapeutics Number" of the Indian Medical Review

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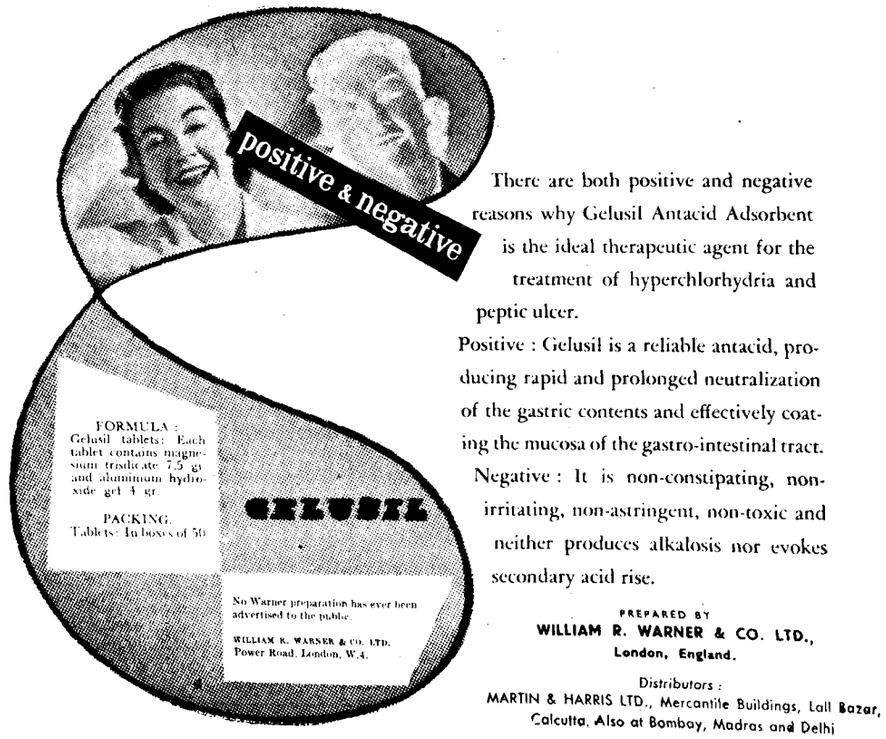

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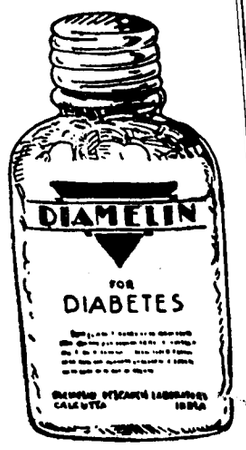

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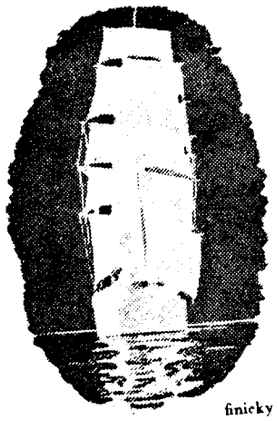

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Vit. B_2 10mg 100 2-½ 1000 23/-
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,, ,,**B_{12} Tab** 20mgx25 3-12 100 3-12
,, ,, K 10mg 100 1-10 1000 6-0
Vit.B Comp tab Eng. 100 1-4 1000 6-14
,, c tab 50 mg Eng. 1000 8-0
PotasChlorus Tab. 500 2-2 **Pow. lb.** 2-8
Calcii Lactas tab. 1000 3-10
Apiot & Steel Pill Aust. 100 1-8
AminophylintabEng 100 1/14 1000 8/4
Cinchophan (Atophan) 100 x 5gr. 3-6
Folic Acid.Tab 5mg 25 2-0; 100 6-0
Calcii Gluconate tab. 7½ gr. 1000
Saridon 250 24-4; 10 tab 1-2 [5-8
Nivaquin 10's 1-1 100's 8-14
Tinct. Camphor Co. PD 500 4-0
Santonine Calomel 50 2-2 100 3-12
APC tab. 1000 **Ind.** 8-8 100 1-5
Vitamin B1 1mg. USA 500 1-0
Phenobarbit. 100x1½gr 1-6 **1000** 8-14
Cibazol 250 13/-; **Voic Tab** 100 0-15
Nicotinic Acid W.B. 500 3-8
MB 760 2C-0; MB 693 500's 29-8
Whifens Emetine Hyd. ½Grx20 4-4
Resochin 10 tabs 1-3 1000 89-0
Yeast tab Eng 1000 7½gr 5-8
Soda Mint Howd. 1000 2-13 **Ind.** 1-8
Sulpha Tab. 1000's 500
,, nilamide 6-14 3-14
,, guinidine 11-4 6-2
,, thiazole Boots 23-0 13-14
,, ,,Tedco 500 11/- Ind. 8-8
,, diazine 100 7-4; 500 31-0
M.B. Thalazole 500's 45-0
Sulphamezathine ICI 500 24-6
Sulphatriad MB 100 7-12 36-4
Sulphonamide Powder 1 lb. 5-4
,, cream 4 oz 5-8 1 oz 1-14 doz
Atropin Sulph Dr. 2-12 **Gentian Violet**
Digoxin BW 12x1 cc. 1-8 [oz. 1-6
Codina **Phos** 5-0 Dionine dr. 6-12
Ext. Ergot.Ind. 4 oz 2-12; lb. 9-4
Sodasaly 3-4 lb. Santonine MB dr. 3-15
Oil Chinapodi oz. 4-8 **Aspirin** 3-10
Silver Vitelin 2-0 **Menthol oz** 3-12
Protargol 1-4 Pot. Bromide 3-6
Aletris Eng. 2-4; Rio **USA** 9-2
Atebrin 3 g. 25A 10-4; 6x1 gr. 3-4
Atophanyl **Amp. IVorIM** Eng. 3-12
Berin 10cc 50mg. 2-10; 100mg. 3-7
Calci Ostelin 15cc. 3-3 **Combex** 10cc 6-8

Campolan 5 ampx 2cc 6-0 10cc 5-0
Aminopylin **Ger.** 6x10cc. 2-8
Camphor-in-oil 3gr. 10A 0-7
Distil Water 100 amps
2 cc. 2-6; 5 cc 3-2; 10 cc. 4-2
A & H Emetine Hydro
BDH ,, ,, 6x1gr 2-15 25A 11/-
Glucose 25%x25ccx25 amps. **Ind.** 3-12
,, ,, 6A Thilo Ger. 3-4
Irgapyrin 5A 7-4 Tab. 20 5-6
NAB. 0. 15 0-10; 30 0-11; 45 0-13
Milk c Iodine 50Ax5cc 3-12 [4-8
Normal Saline 100Ax5cc 3-4 **10cc.**
Vit. C Amp. Ger 500 mg. 3x5cc. 1-8
,, ,, 25x5cc 6-0 50x5cc 11-8
,, ,,100mg 6x2cc 1-6; 50 x 2c. 6-0
Sandoz. Cal. Gluco c Vit C.
5Ax10cc, 5-8; 10Ax5cc. 9-12
Sulphamezethin 25amp.x3cc 3-8
Sulphamezethin Oint 3%x4 oz 1-0
Ergot Amp 6x1cc. P.D. 2-4
Pulse Meter ½ **Mt. Ger.** 1-2
H.T. Ind. Morph. Sul. ¼ gr. x 20 2-8
,, **BW** ,, c **Atropine** ¼gr. x 20 4-0
Ind. Mor. Atropine ½gr. 12 amps 4-8
,, ,, 100 amp. 25-0
Morphia Sulphate 2x¼grx1cc 4-0
TCF. Vit. B Comp. 10cc 3 2
,, W. Liver Ext. 10 cc 2-8
,, ,, ,, c C & B 10cc 3-6
,, ,, ,, c B_{12} 10cc 3-8
Thermameter ½ M. Hicks 10cc 6-10
,,Zeal USA Eng. Jap. Flat **Germ.**
26-12 10-0 12-0 7-8 11-8 7-12
B.D.Stethescope 19-12 Triple 34-0
Germ. **Stethescope** (B.D.type) 8-12
Dres. Forcep 0-12; Scissors 1-1
Artry Forceps 1-12; Dis.Scale 3-6
Saline Apparat. comp 300cc. 6-0
Hopo. Syringe (S.N. Re.1 more)

AG	2	5	10	20	30	50cc
Jap.	0-9	0-14	1-1	1-2	2-0	3-4
Italy	0-11	0-15	1-3	2-2	5-8	6-8
Germ.	0-12	1-2	1-8	2-0	4-8	5-8
Record						
Ger.	2-12	3-12	4-4	8-0	10-0	14-8
,, Swiz	2-10	3-10	4-0	6-12	8-8	12-0
BDLock	7-12	10-0	12-0	18-0	23-10	32-0
Japan ,,	1-5	1-12	2-2	2-3	3-12	4-8
M.Case	0-14	1-8	1-14	2-11	4-10	

Suture Needle
Needles Jap. Germ. doz. 2-12
Doz. 1-8 1-8 D.B. 3-8
All Glass Needles Luer Mount
Jap. 1-8 Ger. 2-8 **D.B.** 3-12 **B.D.** 9-8
F.L. Japan 1-0 doz **Durapak** 2-4 **doz**
F.L. Washable Ger. 0-8; Ind. 0-4
Ear, MetalSyringe 2 oz. 4-8;
Hemoglobin **Scale Book** 1-8 [4oz 5-8
Universal Tooth Forcep 3-12
Erkameter German 61-0
Methyl Testosteron 10mgx25 9-0
,, 25mgx25 15-8

Morphia Tartrate Amp. 5 x 1 cc. ¼ gr. 0-10 box. Omnopon Amps c Needle Tube 0-4

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In all stages of Intestinal Amœbiasis

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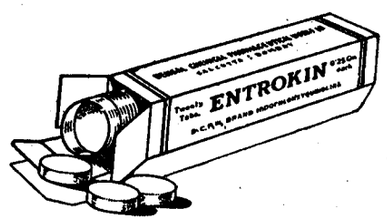

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useful in Vitamin deficiency resulting in symptoms of fatigue, anorexia and loss of weight, etc.

Vibiton contains per fluid ounce :

Vitamin B1 (Thiamine Hydrochloride)	16.0mg.	Methionine	250.0 mg.
Vitamin B2 (Riboflavin)	4.0 mg.	Nicotinamide	50.0 mg.
Vitamin B6 (Pyridoxine)	2.0 mg.	Sodii Glycerophos.	400.0 mg.
Vitamin B12	10.0 mcg.	Liver Extract	
Cal. Pantothenate	12.0 mg	(in terms of fresh liver)	80.0 gm.
Choline Chloride	60.0 mg.	Malt Extract	q.s.
		Absolute Alcohol	15% v/v.

25 per cent extra quantities of Vitamin B1, B2, B6 and Nicotinamide are added to compensate loss due to storage.

Available in 4 oz. phial and 1 lb. bottle

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APRIL, 1955

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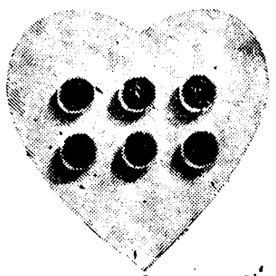

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Council on Pharmacy and Chemistry of the American Medical Association: *J.A.M.A.* 152:331 (May 23) 1953.

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Greiner, T., & Gold, H.: *J.A.M.A.* 152:1130 (July 18) 1953.

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Goldman, B. R., & Steigmann, F.: *J. Lab. & Clin. Med.* 40:803, 1952.

MERCLORAN is today's choice for daily, oral diuretic therapy. Even and sustained daily diuresis with MERCLORAN permits simple, safe prevention and control of edema and helps avoid relapse into cardiac failure.

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MERCLORAN (chlormerodrin, Parke-Davis) is available in bottles of 25 tablets, each containing 18.3 mg. of 3-chloromercuri-2-methoxypropylurea.

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