

382 The Antiseptic

1382 A Monthly Journal of Medicine & Surgery

2-5- Founded by the late Dr. U. RAMA RAU in 1904.
Editor: U. KRISHNA RAU, M.B., B.S., M.L.A. Associate Editor: U. VASUDEVA RAU, M.B., B.S.
Editorial & Publishing Office: 323-24, Thambu Chetty St., Madras-1.
P. O. Box 166 Telephone: 2163
Telegram: "ANTISEPTIC"

Subscription Rs. 7-8-0. Foreign Rs. 10 a year. Single Copy Rs. 1-0-0 in advance.
Pages from 335 to 414. Contents on Advt. page 2. Index to Advertisers on page 4.

BETONIN

An excellent vitaminised tonic and restorative

Contains
IRON, ESSENTIAL VITAMINS OF THE B COMPLEX GROUP,
GLYCEROPHOSPHATES, STRYCHNINE AND CAFFEINE.
Supplied in bottles of 8 oz.

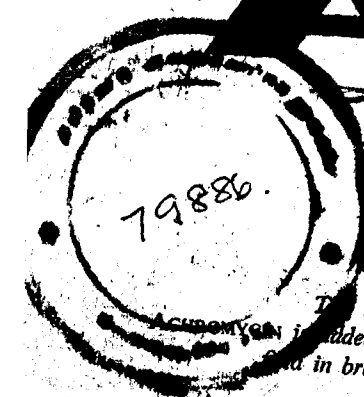
3 JUN 1955
Boots
SINGAPORE DRUG CO. (INDIA) LTD., P. O. BOX 680, BOMBAY.

LOCULA

Sodium Sulphacetamide
Solutions and Ointment

IN
Conjunctivitis, Trachoma, Corneal Ulcer,
Blepharitis, Industrial Eye Injuries,
Ophthalmia Neonatorum, prophylactic and
Curative, Chronic Discharging eyes, etc.

By the same manufacturer as
SANTAL MIDY PREPARATIONS WORKS LTD.,



...A true broad-spectrum antibiotic

The rapid, world-wide acceptance of ACHROMYCIN is added proof that Lederle leads the world in broad-spectrum antibiotic research.

ACHROMYCIN Tetracycline is the best tolerated of all broad-spectrum antibiotics, with the added advantage of increased stability and prompt diffusion in body tissues and fluids.

It is effective against Gram-positive and Gram-negative organisms, as well as rickettsial, virus-like and mixed infections.

Seven dosage forms now available—capsules, intravenous, Sparsoids* dispersible powder, pediatric drops, intramuscular, topical ointment, ophthalmic ointment.



LEDERLE LABORATORIES (INDIA) LTD., P.O.B. 1994, BOMBAY

MAY]

OFFICE OF THE REGISTRAR
THE ANTISEPTIC
3 - JUN 1955

[1955

NEW ANTIBIOTIC

BROAD-SPECTRUM
ANTIBIOTIC OF CHOICE

STECLIN
HYDROCHLORIDE
Squibb Tetracycline Hydrochloride

Steclin is the newest broad-spectrum antibiotic.

- Fewer side effects, better tolerated than oxytetracycline or chlortetracycline.
- Greater stability in blood serum.
- Efficient distribution to tissues and body fluids.
- Fully effective blood levels.

250 mg. capsules
Bottles of 8
and 16

SQUIBB

The range of clinical usefulness of Steclin is similar to that of oxytetracycline and chlortetracycline. It is often superior to its analogs because therapeutic blood levels are achieved with fewer gastrointestinal side effects.

As with all broad-spectrum antibiotics, overgrowth with non-susceptible organisms, particularly meningitis, may occur.

"STECLIN" IS A TRADE MARK

SARASWATI CHEMICALS, BARODA.
Manufacturers of Squibb Products in India

CONTENTS

ORIGINAL ARTICLES	PAGE	EDITORIAL	PAGE
Trends in Pharmacological Research. —R. B. Arora, M.D. (Med.), M.D. (Pharm.), Jaipur ...	335	Blood Transfusions— (The Use and Abuse of Blood) A Review of Current Literature ...	405
Abdominal Tuberculosis. —Major V. K. Chari, M.B., B.S., T.D.D., Mathurai ...	351	GLEANINGS FROM MEDICAL PRESS :—	
Hyperemesis Gravidarum and its Management. —Arun Kumar Bagchi, B.Sc., M.B., B.S., D.G.O., Calcutta ...	357	Medicine and Therapeutics	
Some Aspects of Impotence in the Male. —B. Krishna Rao, M.B., B.S., (Post-graduate in Sexology of the Kar- lovy University, Prague), New Delhi ...	359	Management of extra-systoles ...	356
A Glimpse into Ayurveda. —P. L. Deshmukh, M.D. (Bom.), D.T.M.H. (Lond.), F.C.P.S. (Bom.), F.A.C.C. (U.S.A.), F.C.C.P. (U.S.A.) Poona ...	369	The effect of antibiotics on spermatozoa <i>in vitro</i> , spermatogenesis and their con- centration in testicular tissues ...	367
Cyst(e)ine in Health and Disease. — V. Mahadevan, M.A., D.Sc., F.R.I.C., Madras-7 ...	373	Early post-surgical ambulations ...	368
Advances in Cardiac Therapy. —B. M. Kothary, M.B., B.S., Bharatpur ...	383	Anticoagulants in coronary disease ...	381
Acidosis. —Ganendra Kumar Chakravarti, M.B., Burdwan ...	387	Is blood pressure being read properly? ...	382
Hypertensive Heart Disease. —S. R. Das, Calcutta-14 ...	392	Medical maxims of an internist ...	382
CASES AND COMMENTS		Controlled hypotension ...	386
Pathology of Coronary Artery Disease. (With Autopsy Record of Two Cases)— D. Bhaskara Reddy, M.D., Viakha- patnam ...	399	Toxic effects of citrated blood ...	391
		Immunological factors in rheumatoid arthritis ...	398
		Obstetrics and Gynaecology	
		Normal labour including anaesthesia and analgesia: The place of forceps in pre- sent day obstetrics ...	410
		Reviews of Books and Periodicals ...	411

PENOTRANE—WB

(Hydraphen)

Fungicidal and bacteriostatic, based on mercury in organic combination—precludes the toxic side effects of a straight mercury anion. Presented as Jelly, Pessaries and Powder (Insufflators and Refills).

Penotrane Jelly is the ideal agent for local application in the prevention and treatment of infective conditions, particularly for fungal infections of the skin, athlete's foot and ringworm. This is also most suitable for first-aid treatment and for Catheter lubrication.

B.M.J., 1952, 2, 452:

Penotrane has a place in the treatment of Trichomonas Vaginalis infections, but at present relapses tend to occur, particularly after menstruation or if treatment is interrupted even for a short time. It is recognized, however, that relapses or recurrences, often due to reinfection, are frequently observed with other tried remedies, and Penotrane appears to suit some patients who have not responded to other treatment.

Penotrane Dusting Powder, supplied in Polythene container fitted with insufflating nozzle, is an effective antiseptic first-aid dressing for cuts, abrasions, weeping eczema, ulcers, minor wounds, irritant skin conditions and prickly heat.

Manufacturers Sole Agents:

**WARD, BLENKINSOP & CO.
(INDIA) LTD.,**

1/110, Haines Road, Bombay-18.



Distributed in India by:

**EVANS MEDICAL SUPPLIES
(INDIA) LTD.,**

Bombay Calcutta Madras

MAY '55]

THE ANTISEPTIC

3

Own **OLYMPUS**

• SERVICE • STABILITY • SUPERIORITY

LABORATORY MICROSCOPE

Improved Model GB

Mechanical Tube Length 160 mm. * Graduated Draw Tube * Fixed Square Stage with Built on Graduated Mechanical Stage * Fine Adjustment of Double Lever type without scale * Condensor n.A. 1.2, (with iris)—movement by Rack and Pinion * Triple Nose-piece * Interchangeable for Dark Field Condensor, Phase Contrast Accessories, Binocular and Monocular Attachments.

Huygen's Eyepiece 5x, & Periplan 10x, & 15x Achromatic Objectives 10x, 40x and 100x Oil Immersion... Magnification: 50x—1500x.

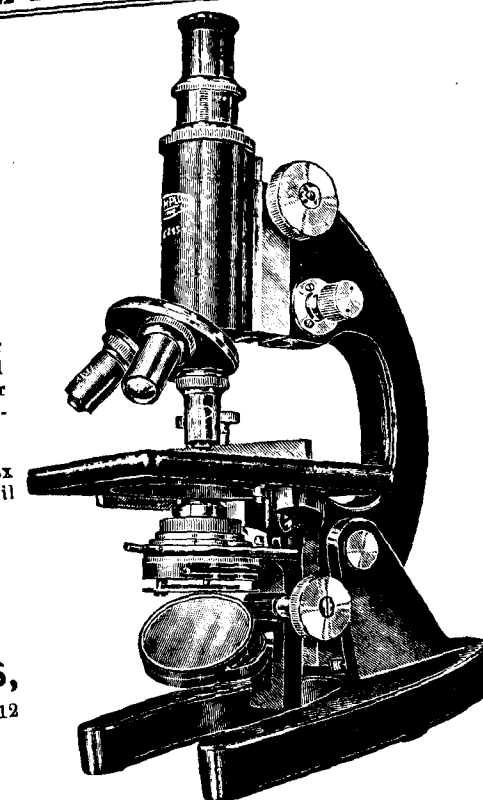
Price Rs. 788/-

For demonstration and other particulars contact your dealers or the sole agents:—

DARBARA SINGH & SONS,
14, Bow Bazar Street,
P. O. Street, Sadar Bazar,
186, Hornby Road, Fort,

Calcutta-12
Delhi-6
Bombay

Also available various other models



Guaranteed

“HEALTH”

A Monthly Journal Devoted to Healthful Living

Founded by the late Dr. U. RAMA RAU in 1923

Editor: U. KRISHNA RAU, M.B., B.S., M.L.A.
Associate Editor: U. VASUDEVA RAU, M.B., B.S.

Annual Subscription:

Inland ... Rs. 2-8-0
Foreign ... Sh. 5 Post paid
Single Copy ... As. 0-4-0

Editorial & Publishing Office:

323-24, Thambu Chetty Street,
MADRAS-1

Verf. hnd
n

INDEX TO ADVERTISERS

	Page		Page
Aeon Chemical Industries Ltd.	69	Mandoss Drugs Ltd.	67
Alarain Pharmaceuticals (India)	68	Marmite Food Extract	68
Albert David Ltd.	32	Martin & Harris Ltd.	21
Alembic Chemical Works Co. Ltd.	18	Martin H. Smith Company	21
Alkaloid Research Laboratories, The	69	May & Baker (India) Ltd.	68
Amarchand Sobachand	54	Medical Digest	11
Asepticus Co.	68	Menley & James Ltd.	78
Associated Drug Co. Ltd.	45	Mukerji H. & Banerjee Surgical Ltd.	60
Behar Chemical Works	70	Nath & Co.	81
Bengal Chem. & Pharm. Works Ltd. Inside Back Cover	47	National Pharmaceuticals	78
Bengal Immunity Co. Ltd.	48	Neo-Pharma Ltd.	44
Birla Laboratories	64	New Products (India) Ltd.	25
Boots Pure Drug Co. (India) Ltd. Front Cover &	53	New Guardian of India Life Insurance Co. Ltd.	38
British Drug Houses (India) Ltd.	19	Organon Laboratories Ltd.	7
Burroughs Wellcome & Co. (India) Ltd.	58	Oriental Pharmaceutical Industries Ltd.	44
Calcutta Chemical Co. Ltd., The	68	Parke, Davis & Co. Ltd.	70
Capco Ltd.	61	Parry & Co. Ltd.	71, 74
Chemapol Ltd.	20	Pharmed Ltd.	60
Chowgule & Co. (Hind) Ltd.	35, 50	Pixie Products	70
Cilag-Hind Ltd.	15	Popular Book Depot, The	8
Cipla Laboratories	16	Primo Limited	43
Coates & Cooper Ltd.	48	Ramthirth Yogashram, Shri	45
Corn Products Co. (India) Ltd.	59	Ranbaxy & Co., Ltd.	27
Crookes Laboratories Ltd., The	37	Ravison Pharmaceuticals Ltd.	10
Current Technical Literature Co., Ltd.	8	Richard Kallmyer (Erkameter)	4
Darbara Singh & Sons	3	Sandoz Ltd.	28
Distillers Co. (Biochemicals) Ltd.	39	Sanitex Chemical Industries Ltd.	80, 82
Dumex Limited	63	Scientific Publication Concern	1
East India Pharm. Works Ltd.	29	Shah & Co., D.	4
Eli Lilly and Company of India Inc.	33, 34	Shalimar Paint Colour & Varnish Co., Ltd.	31
Franco Indian United Laboratories	62	Smith Trading Co.	73
General Electric Co. of India Ltd.	26	Sree Sakthivillasa Vaidyasala	58
Geoffrey Manners & Company Limited	12, 41	Sreevatsa Chemicals & Drugs Ltd.	70
Glaxo Laboratories (India) Ltd.	46	Stadmed Ltd.	67
Gluconate Ltd.	22	Sundaram Motors Ltd.	78
Grahams Trading Co. (India) Ltd. (Ovaltine)	72	Suren & Co. Ltd., W. T.	88
Hamdard	3, 75	Swann & Co. Ltd., W. R.	38
Health	75	Tablets Ltd.	40
Health & Co. (A.M. Dept.)	42	Therapeutic Pharmaceuticals	6
Herbertsons Ltd.	68	Unichem Laboratories	57
Himalaya Drug Co., The	52	Union Drug Co. Ltd.	9
Horticks, Ltd.	71	Voltes Ltd.	49
Hygienic Research Institute	8	Ward Blenkinsop & Co. (India) Ltd.	78
Imperial Chemical Industries (India) Ltd.	70	Waterbury's Compound	68
Impex Agency, The	68	William R. Warner & Co. Ltd.	2
Indian Health Institute & Lab, Ltd	67	Wincarnis	54, 57
Indoco Remedies Ltd.	14	World Chemical Works Ltd.	51
Infra Ltd.	69	Zandu Pharmaceutical Works Ltd.	53
James A Jobling & Co. Ltd.	17, 24	Zaveri & Sons	47
John Wyeth & Brother Ltd.	77	Zone Chemical Co., The	67
Jugat Singh's Son & Bro.	6		
Kothari Book Depot, The	23		
Lederle Labs. (India) Ltd.	30		
Lever Bros. (India) Ltd.			

Fresh arrival of German MICROSCOPES

- Colorimeters
- Ovens & Incubators
- Centrifuge Machines
- Ultra & Infrared Lamps
- Sedimentation Racks
- Humometers Etc.

D. SHAH & Co.,
24, Sardar Griha,
Lohar Chawl, BOMBAY-2.

By Rai Dr. A. R. MAJUMDAR BHADUR,
Prof. of Clinical Medicine, Medical College,
Calcutta, Rtd.
(With Six Specialist Collaborators)

BED-SIDE MEDICINE
Ninth Edition. Demy 1488 plus xii pages. 684
diagrams & 2 multicoloured plates.
Thoroughly revised, in places rewritten and
amplified with latest information.
A comprehensive text-book of Medicine Clinical &
Systematic, containing (a) latest methods of exami-
nation, clinical, instrumental and labora-
tory, and (b) full description of Diseases with
etiology, pathology, clinical picture, diagnosis,
prognosis and up-to-date treatment.
Price: Rs. 22-8-0. Postage extra

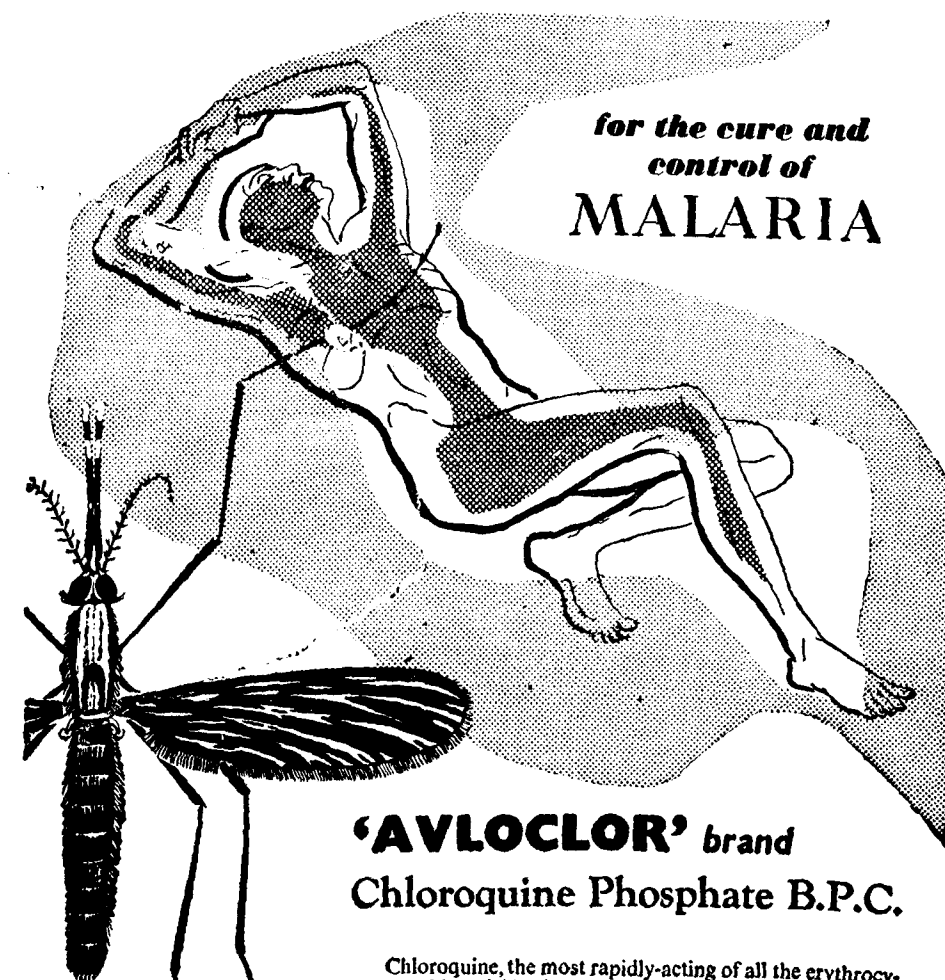
SCIENTIFIC PUBLICATION CONCERN,
9, Wellington Square, CALCUTTA-18, &
OSMANT & CO., MYMENSINGH, B.P.

ERKAMETER the bloodpressure apparatus

MAY '55]

THE ANTISEPTIC

5



for the cure and
control of
MALARIA

'AVLOCLOR' brand
Chloroquine Phosphate B.P.C.

Chloroquine, the most rapidly-acting of all the erythrocytic schizonticides in use today, is widely recommended as the drug of choice for the control of an acute attack of malaria, especially falciparum malaria in which it not only controls the attack but achieves radical cure by a short course of treatment. In semi-immune subjects, clinical cure can be achieved by a single dose of 4 tablets of 'Avloclor'.

The drug does not produce any serious toxic effects when given in therapeutic dosage.

Chloroquine has also established itself as a powerful remedy in hepatic amoebiasis, for the treatment of which it rivals emetine.

Available in
tablet form
(0.25 gramme)
for oral
administration,
in packs of 4,
10 and 500.



IMPERIAL CHEMICAL INDUSTRIES (INDIA) LIMITED
Calcutta Bombay Madras Kanpur New Delhi
Ahmedabad Amritsar Bangalore Cochin

ICI 28A

KOTHARI'S LATEST ARRIVALS OF TIMELY BOOKS

ALEXANDER—Reactions with Drug Therapy, 1955	Rs. 30 0
BAILEY—Surgery of the Heart, 1955	Rs. 100 0
BRITISH OBSTETRIC AND GYNAECOLOGICAL PRACTICE— Edited by Holland and Bourne	
Vol. 1, Gynaecology, 1955	Rs. 59 6
Vol. 2, Obstetrics, 1955	Rs. 71 4
CAMPBELL—Urology by 51 Authoritative Contributors, complete in 3 Volumes containing 1148 illus. 1955	Rs. 210 0
HANDBOOK OF MEDICAL TREATMENT—(Formerly Handbook of Medical Management), 4th Ed. 1954	Rs. 14 0
HAWK and others—Practical Physiological Chemistry, 13th Ed. 1954	Rs. 60 0
JAWETZ—Review of Microbiology, 1954	Rs. 20 4
LICHTMAN—Diseases of the Liver, Gallbladder and Bile Ducts, 3rd Ed. 1953 2 Vols.	Rs. 88 0
Mac LEOD & READ—Gynaecology, 5th Ed. of the old Edition and LOCKYER —Gynaecology, 1955	Rs. 50 0
PHYSICIAN'S HANDBOOK—8th Ed. 1954	Rs. 12 0
TISS and OPPENHEIM—Liver, Pancreas and Biliary Tract, 1955	Rs. 60 0
PULLEN—Pulmonary Diseases, 1954	Rs. 60 0
WAKELEY—Modern Treatment Yearbook, 1955	Rs. 15 10

Write to us for your requirements of medical books always.

THE KOTHARI BOOK DEPOT

(Established 1935)

Exclusive House for Medical Books

Phone : 60805

Parel, BOMBAY-12

Gram : "KOBOK"

Traditional and international

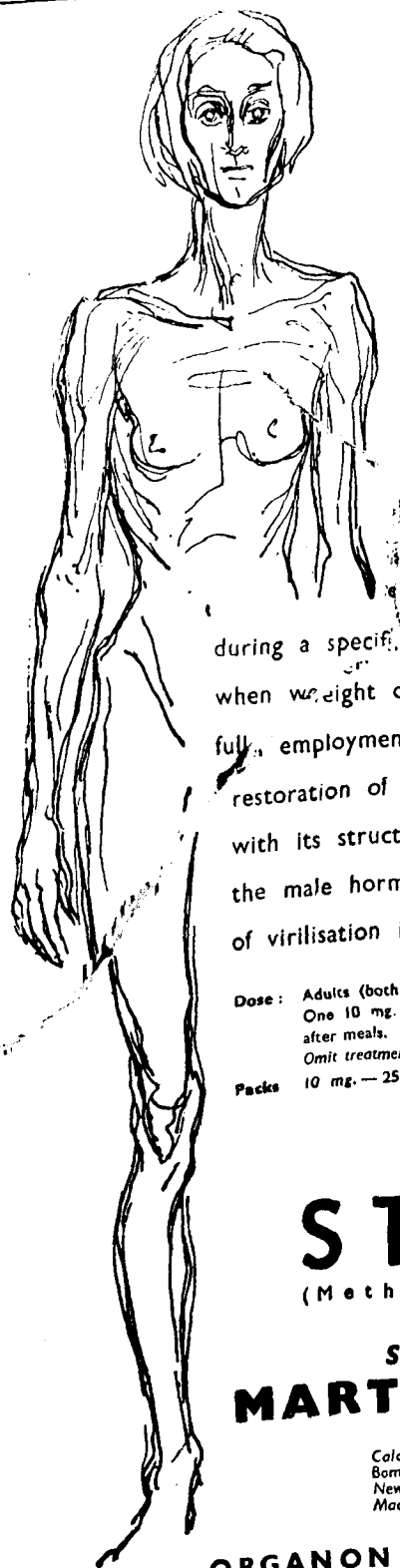
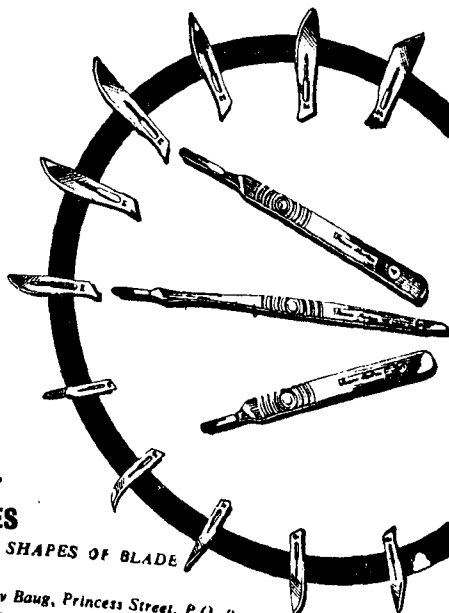
These eleven shapes of surgical blade have become traditional—and international. Hospitals all over the world send to Sheffield for ever increasing supplies; so the model factory built to produce Swann-Morton blades is always expanding. But, however great the pressure of orders, there is never any relaxation of the individual care given to each individual blade.

Swann-Morton

SURGICAL BLADES AND HANDLES

3 TYPES OF HANDLE · 11 TRADITIONAL SHAPES OF BLADE

AGENT: Jagjivandas & Co., Keshav Baug, Princess Street, P.O. Box No. 2125, Bombay 2, India
W. R. SWANN & CO. LTD. SHEFFIELD 4 ENG. LONDON OFFICE: 63 OXFORD RD. LONDON W.3
1954



When weight gain is essential

during a specific wasting disease or in convalescence when weight depletion is a complication, Stenediol ensures full employment of dietary protein and the consequent restoration of body tissue. It has this property in common with its structural relation, methyltestosterone, but unlike the male hormone, Stenediol is free from the side-effect of virilisation in the recommended dosage.

Dose:	Adults (both sexes):	Children (boys and girls before puberty):
	One 10 mg. tablet thrice daily after meals.	One 10 mg. tablet daily, or on alternate days as required, after meals.
Packs:	Omit treatment every fourth week.	
	10 mg. — 25 and 100.	

Literature on request.

STENEDIOL

(Methylandrostenediol. Organon)

Sole Agents for India and Burma:

MARTIN & HARRIS LTD.

BRANCHES:

Calcutta: Mercantile Buildings, Lall Bazar St.
Bombay: Savoy Chambers, Wallace St., Fort
New Delhi: 22-a, Mahant Bldgs., Asaf Ali Road
Madras: Sunkurama Chetty St., Rangoon: P.O.B. 97

ORGANON LABORATORIES LTD., LONDON

LIST OF SOME USEFUL PUBLICATIONS

Favourite Prescriptions—by Sir Ogilvie and Thomson	Rs. A. ... 3 12
Dr. Menino De Sousa, M.D.—How to Examine a Patient—Cloth bound	... 2 8
CHOKSEY—Dentistry in Ancient India, 1953	... 5 8
Drs. Jean Saidman & P. M. Mehta—Elements of Light Therapy, '52	7 8
Dr. Sun Mukh S. Yogi—Kaya-Kalap (Science of Rejuvenation)	... 5 0
GHARPUREY—The Snakes of India & Pakistan, 1954	... 5 0
GUNAJI—Anti T.B. Tuberculosis & Anti H. F. Heart Failure (A system of Simple Heart Exercises), 1954	... 3 0
MASANI—Ectopic Pregnancy '49	8 0
MODI—Dental Surgery for Medical Practitioners, 1923	... 2 0
WAKELY—Modern Treatment Year Book, 1955 (Just received)	... 15 10
Practical Public Health Chemistry—A.F. Heredia, M.B.D.P.H.D., Hy., '54	3 0
A Text Book of Gynaecology by K. M. Masani, Collaborators: B. N. Purandare, E. J. Borges, J. A. Fernandez, N. S. Vahia	... 17 8

Ask for our Book Bargains Catalogue.
THE POPULAR BOOK DEPOT (Regd.)
 Lamington Road, BOMBAY-7

Some STANDARD TEXT BOOKS For MEDICAL STUDENTS & PRACTITIONERS

Books by **Dr. B. N. GHOSH**,
 M.B.E. F.R.F.P.&S. (Glas.), F.R.S. (Edin.)
PHARMACOLOGY, MATERIA MEDICA & THERAPEUTICS
 19th Edn. 1952. Rs. 20/- or 30 s. each.
A TREATISE ON HYGIENE & PUBLIC HEALTH
 13th Edn. 1953. Rs. 17/8/- or 25/6 d. each.

Book by **Dr. S. C. DAS**,
 M.B., Ph.D. (Edin.), F.R.S.E.
POCKET COMPANION FOR MEDICAL STUDENTS & PRACTITIONERS
 Rs. 5/8. or 10 s. each.

"ANTIBIOTIC THERAPY" IN MEDICAL & VETERINARY PRACTICE

By **Dr. M. L. GUJRAL**,
 M.B., M.R.C.P. (Lond.),
 Professor of Pharmacology, K. G. Medical College, Lucknow.
 1955. Price Rs. 12/8/- or 18 s.

Please write to us also for Medical & other Scientific Models & Charts.
 Various other books details on request.

SCIENTIFIC PUBLISHING CO.,
 85, Netaji Subhas Road, CALCUTTA-1
 P. B. No. 969 Telegrams: CREOLION

Reference Books FOR THE General Practitioners

BAKER—Introduction to Medical Laboratory Technology, 1954	Rs. A. ... 22-8
CORONATION NUMBER—Medicine Illustrated	... 6-0
DAVIDSON—Brompton Hospital—The Story of a Great Adventure, 1954	... 18-12
DONALD—Practical Obstetric Problems, 1955	... 33-12
DONOVAN—Medical Electronics, 1953	... 22-8
KIELAND'S Forceps, 1952	... 26-4
KINNIER-WILSON—Neurology, 3 Volumes	... 157-8
MEREWETHER—Industrial Medicine and Hygiene—3 Volumes—Volume I and II available Volume III in preparation	... 141-12
Modern Treatment Year Book, '55	... 15-0
SPC T DIAGNOSIS, Vol. I, 1954	... 5-10
SPO T DIAGNOSIS, Vol. II, 1955	... 6-6
TIDBY—Synopsis of Medicine, 1954, 10th Ed.	... 21-14
WINSBURY-WHITE—Stone in the Urinary Tract, 1954	... 47-4

CURRENT TECHNICAL LITERATURE COMPANY,
 Madras Branch: LIMITED, Head Office:
 331-333, Thambu Chetty St., "INDIA HOUSE,"
 Post Box 12, Opp. G.P.O.,
 MADRAS-1 P. B. 1374, BOMBAY-1

For Life Assurance

Consult

THE
 NEW GUARDIAN
 OF INDIA

LIFE INSURANCE CO., LTD.

Head Office:

"United India Life Building,"
 Esplanade, MADRAS
 (Estd. 1934)

An Ideal Insurance Company
 to insure with or to represent

The Latest
 and Most Significant Advance
 in the Treatment of

PULMONARY TUBERCULOSIS

Since

ISOPASCAL c CD Tablets & Granules
VITAZIDE Sugar Coated Tablets

CIAZIDE-50
 Cyanacetyl Hydrazide 50 mg. per tablet

CIAZIDE-100
 Cyanar Styl Hydrazide 100 mg. per tablet

CYANOPASCAL

Each tablet contains:

Cyanacetyl Hydrazide	.. 20 mg.
Para amino salicylic acid	.. 0.5 gm.
Di-Calcium Phosphate	.. 100 mg.
Vitamin D	.. 250 I.U.

Effective in all forms of

PULMONARY TUBERCULOSIS

More effective in cases resistant to all other drugs

Detailed Literatures and Rates on request from:

THERAPEUTIC PHARMACEUTICALS
 Chotani Estate - Proctor Road - BOMBAY-7

DISTRIBUTORS:

1. MADRAS:—Therapeutic Agencies, 4, Kondichetty St.
2. KOTTAYAM, T. C. State:—Maitesethra Corporation, Muttambalam P.O.
3. CALCUTTA:—Kadride Enterprises, 33, Chittaranjan Avenue, P. O. Box No. 2675
4. PATNA:—C. T. SHAH, P. O. Box No. 64, Bankipore, P. O.
5. AHMEDABAD:—Messrs. C. M. Gandhi & Co. B5, 979/26, Dr. Ambedkar's Blocks
6. COLOMBO, Ceylon:—Messrs. Kapadia Ltd., 100, Second Cross Street
7. BARODA:—Mr. O. J. Shah, Babji Sadan, Sursagar, North
8. JAMMU TAWI:—Mr. Balmakund Sharma, Clo. Messrs. Brij Bal & Co.



POSITIVE CONTROL OF SURGICAL INFECTIONS

Hankins and Yeager† found a single injection of benzathine penicillin effective in the management of infections requiring surgical treatment in 46 patients (33 treated therapeutically; 13 prophylactically) who would otherwise have needed multiple doses of procaine penicillin. This new, versatile penicillin compound—a product of Wyeth research—is now available to Surgeons as 'Penidure'.

†(Journal of the American Medical Association, 155, 15, 1306; August 7, 1954).

* Trade Mark

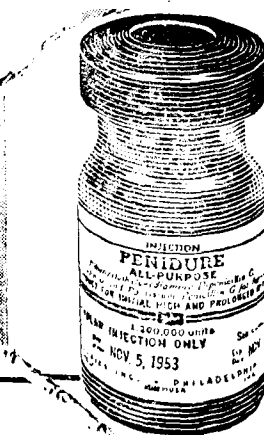
JOHN WYETH & BROTHER LIMITED, LONDON

India Branch: Magnet House, Dougall Road, Bombay 1

Distributors:

GEOFFREY MANNERS & CO., LTD.

Bombay • Calcutta • Madras • New Delhi



Supplied in 3 forms

'PENIDURE'*

Benzathine Penicillin
Injection

'PENIDURE' LONG-ACTING
(Benzathine Penicillin 600,000 units).

Injection

'PENIDURE' ALL-PURPOSE
(Combines Benzathine Penicillin with procaine and potassium penicillins for use in acute infection—1,200,000 units).

Suspension

'PENIDURE' (ORAL)
(Benzathine Penicillin 300,000 units per 5 c.c. for post-operative prophylaxis in minor surgery). 2 fl.oz.

Wyeth

SYRUP NEO-METHIDIN*

Total lipotropic therapy with anti-anaemic principles and the most nutritive carbohydrate: Lævulose (for the first time for oral therapy).

Each fl. oz. containing:

Acetyl-methionine	...	4400 mg.
Choline chloride	...	3500 mg.
Vitamin B ₁₂	...	20 mcg.
Folic acid	...	5 mg.
Inositol	...	50 mg.

In a palatable base of
LÆVULOSE

Bottles of 4 and 8 ozs.

NEO-METHIDIN FORTE*

Protective and curative liver therapy for convenient intramuscular injection for children and adults

Each 2.5 cc. ampoule containing:

d, l-Methionine	...	500 mg.
Choline chloride	...	50 mg.
Inositol	...	100 mg.
Vitamin B ₁₂	...	6 mcg.

Boxes of 5 and 50 ampoules.

In addition to the well-established:

NEO-METHIDIN*

Ampoules 10 cc. (20% d, l-Methionine per ampoule)

The first injectable methionine preparation.

Tablets (0.25 g. d, l-Methionine per tablet)

* Trade Mark Registered



NEO-PHARMA LIMITED

Kasturi Buildings, Churchgate Reclamation,
BOMBAY 1



where
PAIN
is a
symptom...

as in
HEADACHE
TOOTHACHE
MUSCLE PAIN
NEURALGIA
NEURITIS
DYSMENORRHOEA
INFLUENZA

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

ANACIN
ANALGESIC TABLETS

* In piller-proof containers of 32 tablets and packets of 2 tablets each.
* Trade Mark

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

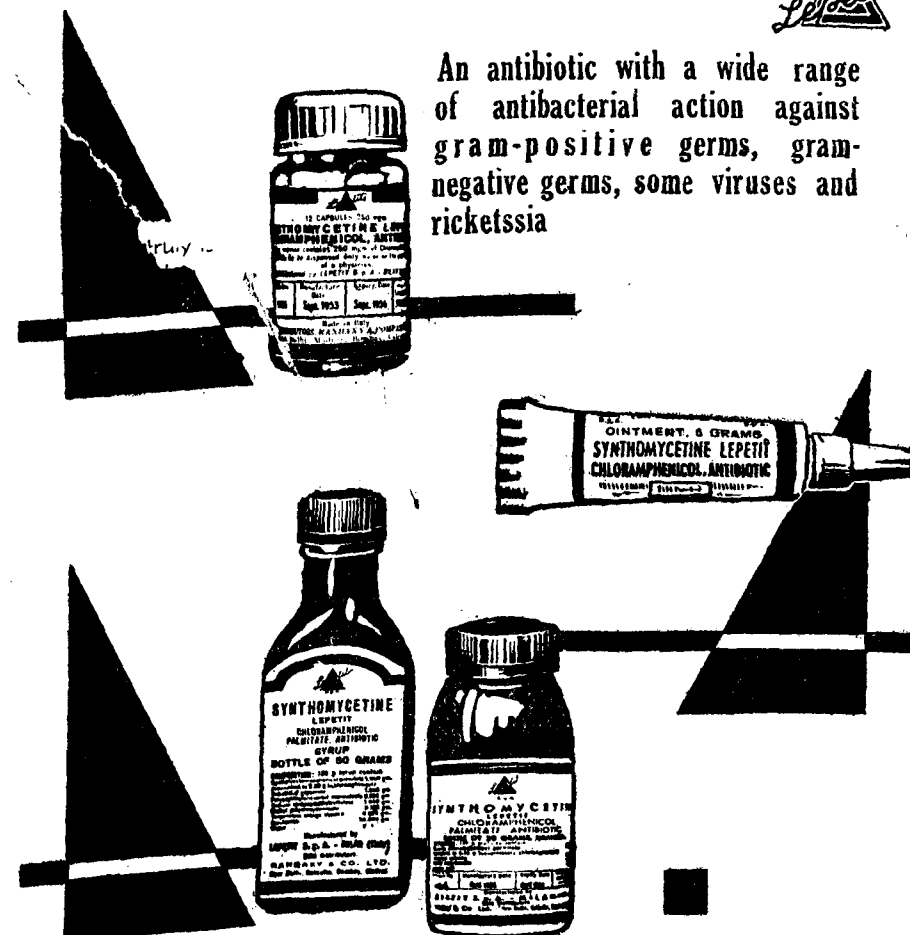
A.108

SYNTHOMYCETINE

l-synthetic chloramphenicol



An antibiotic with a wide range of antibacterial action against gram-positive germs, gram-negative germs, some viruses and rickettsia



Sole Distributors for India
RANBAXY & CO., LTD.
P.O. BOX 104 NEW DELHI

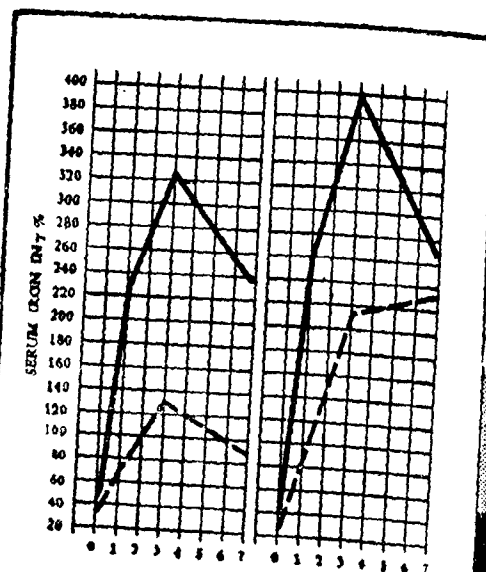
Branches
BOMBAY CALCUTTA DELHI KANPUR MADRAS

P.108

P.108

*In Iron Deficiency
Anaemia . . .*

Ferronicum



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

HOURS

— Ferronicum (175 mg. of bivalent iron)	— Ferronicum (175 mg. of bivalent iron)
... Reduced iron (500 mg.)	... Reduced iron (500 mg.)

The graph shows the better
absorption of Ferronicum as
compared to reduced iron.
Small oral doses of Ferro-
nicum increase the serum
iron level far more than
large doses of reduced iron
(average from 5 patients).
(Jasinsky, Schw. Med.
Wchr., 20, 59, 1950)



SANDOZ LTD. BASLE (SWITZERLAND)

announcing

POLIOMYELITIS VACCINE, LILLY

V-1401 Poliomyelitis Vaccine, Lilly
3 cc. (one immunization)

For additional information consult
the Lilly representative or write
directly to

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

Introduced two years ago

TIBIZIDE

WITH CALCIUM PAS & B VITAMINS

Efficacy is now confirmed

5th Report of the Tuberculosis Chemotherapy Trials Committee, Medical Research Council states that PAS plus Isoniazid daily for a period of three months is very effective both clinically and bacteriologically in the treatment of Pulmonary Tuberculosis and ranks with the most efficacious chemotherapeutic combinations so far tested in this trial. It possesses an advantage over the other established treatments in that both drugs can be administered by mouth.

Composition:

100 gm. Coated Granules contain:

Tibizide (Isonicotinic Acid Hydrazide)	2,000 mgm.
Anhydrous Calcium-para-amino-salicylate	85 gm.
Vitamin B ₁	40 mgm.
Vitamin B ₂	15 mgm.
Vitamin B ₆	5 mgm.
Sodium Pantothenate	5 mgm.
Niacinamide	30 mgm.
Excipients	q.s.

In bottles of 50 gm. and 100 gm. coated granules,
with dosage measure

ALBERT DAVID LIMITED,
15, Chittaranjan Avenue, CALCUTTA-13



hydrocortisone rousssel 10 mg.

Prescribe PYRAMID Glycerin for ear complaints!

Sample prescription for ear drops — useful in ear-aches, acute Otitis Externa and Otitis Media, inflammation of the drums and furuncles in the ear:

Rx	
Phenol	5 gr.
Cocaine hydrochloride	4 gr.
Menthol	5 gr.
Glycerin	1 dr.

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.

None of the new drugs discovered of recent years is a satisfactory substitute for Glycerin. Glycerin's unique qualities make it of basic importance in medicine, and there is no substitute.

GLYCERIN IS SOLVENT

For dissolving obstinate substances like iodine, bromine, tannin and boric acid, etc., there's nothing to replace Glycerin, which is compatible with almost everything.

GLYCERIN IS AN ANTISEPTIC

Glycerin dehydrates the bacteria present on the applied area thus acting as an antiseptic.

Look for the



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

PYG. 2A-25

PYRAMID

on this 7 lb. tin!

• EFFICIENT

• PURE

• CHEAP

MANUFACTURED BY LEVER BROTHERS (INDIA) LTD., P.O. BOX 407, BOMBAY, &



SHALIMAR PAINT, COLOUR & VARNISH COMPANY, LIMITED
CALCUTTA • BOMBAY • MADRAS • NEW DELHI • KANPUR

SPW 227



"Hydrocortisone is the principal adrenal cortical steroid which participates in physiological reaction."
L. W. BOLAND
Journal of the American Pharmaceutical Association
vol. VIII, No. 3, August 1952, p. 540.

the daily dose of :
60 to 100 mg. as an initial dosage
20 to 60 mg. as a maintenance dosage

hydrocortisone roussel tablets

Bottle of 25 tablets of 10 mg.

Rheumatoid arthritis
Acute and chronic rheumatic disorders
Addison's disease
Allergic diseases
Atopic dermatitis - eczema
Disseminated lupus erythematosus
Lipoid nephrosis

An effective and indispensable form of cortical hormone therapy

LES LABORATOIRES ROUSSEL
LABORATOIRES FRANÇAIS DE CHIMIOTHÉRAPIE
89, rue du Cherche-Midi - PARIS 6^e

PARTICULARS, LITERATURE

FRANCO INDIAN UNITED LABORATORIES
Bapnu Ghar-Hornby Vellard - BOMBAY 18

1955]

THE ANTISEPTIC

35

BEDERMIN

B A Y E R

»Bayer«
LEVERKUSEN
GERMANY

SINGLE DOSE TREATMENT
of
ANKYLOSTOMIASIS

A stable combination of
Ascaridole + Carbon tetrachloride

HIGH CHEMICAL PURITY
RELIABLE ACTION &
EXCELLENT TOLERANCE

Sole Importers in India :

CHOWGULE & CO., (HIND) LTD.

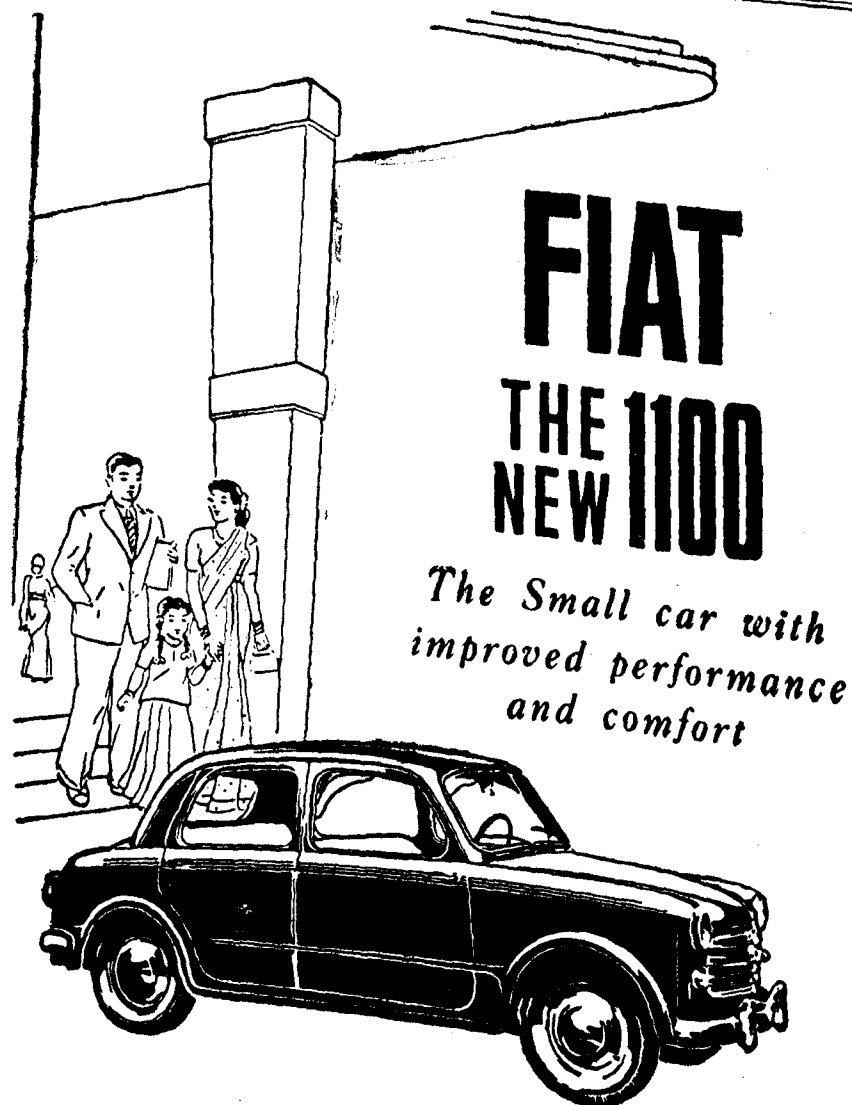
P. O. Box 1478, BOMBAY 1
Branches: P. O. Box 8943, Calcutta 13
P. O. Box 1743, Madras 1

"Sometimes carbon tetrachloride is given in combination with Oil of Chenopodium. This has the advantage to give both the remedies in smaller doses and since their effects on the human host are different and independent, they produce no harmful effects, on the contrary, act as synergists."

—B. N. Ghosh, (Pharmacology, Materia Medica and Therapeutics, 1952).

Packings: Tubes of 6 × 0.6 g. capsules
Bottles of 50 × 0.6 g. capsules
Bottles of 25 cc. (14% solution)

WES/37



*The Small car with
improved performance
and comfort*

T.V. SUNDARAM IYENGAR & SONS LTD.

MADURAI, TIRUCHIRAPALLI, TIRUNELVELI,
PUDUKOTTAI & SALEM.

SUNDARAM MOTORS LTD.
MOUNT ROAD, MADRAS-6.

9V62 52 D



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

C8-6

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.



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

C8-7



NESTOMALT

A PERFECT MALTED MILK
NESTOMALT
MALTED MILK
FORTIFIED WITH VITAMIN B₁
NESTLE'S

MILK
+ MALT
+ VITAMINS

Average Composition
Per 100g ... 9.30
Total Protein 12.95
Lactose ... 12.16
Malt Sugars 60.50
Balanced
Moisture 2.50
Mineral Salts 2.71
Calories per 100g (dry) 120

NESTOMALT

NESTOMALT is made with a concentrated, powder form containing full cream milk, malted barley and wheat flour, with VITAMIN B₁ ADDED.

SUSTAINING
STRENGTHENING
HEALTH-PROMOTING

THE DISTILLERS COMPANY (Biochemicals) Limited

WHEN, as with penicillin, the efficacy of a drug is universally accepted, its convenience and ease of administration then assume importance.

'Distaquaine' preparations present penicillin in the form of a prolonged acting, easily administered aqueous suspension, pre-eminently suitable for almost all those instances in which penicillin therapy is indicated.

'DISTAQUAINE' G

brand

Dry procaine penicillin G and suspending agents for preparation of an aqueous suspension. Vials of 300,000, 600,000 and 3,000,000 units.

'DISTAQUAINE' Fortified

brand

Dry procaine plus potassium penicillin G and suspending agents for preparation of an aqueous suspension.

Vials of 400,000 1,200,000 and 4,000,000 units.

Distributed by the associates and agents of:

ALLEN & HANBURYS LTD.
BRITISH DRUG HOUSES LTD.
BURROUGHS WELLCOME & CO.
EVANS MEDICAL SUPPLIES LTD.
IMPERIAL CHEMICAL
(PHARMACEUTICALS) LTD.
PHARMACEUTICAL SPECIALITIES
(MAY & BAKER) LTD.

Manufactured by

THE DISTILLERS COMPANY (BIOCHEMICALS) LIMITED
DEVONSHIRE HOUSE, PICCADILLY, LONDON, W.1
owners of the trademark 'Distaquaine'

T.C.F. Serpirutin-C

(Brand of R. Serpentina,
Aminophylline and Rutin)

TABLETS

FOR EFFECTIVE
TREATMENT OF
HYPERTENSION.



A product of
**TEDDINGTON CHEMICAL
FACTORY LTD.**

Sole Distributors:
W.T. SURÉN & CO. LTD.
Post Box 229, Bombay 1.



T. C. F. WHOLE LIVER EXTRACT SUPPLEMENTED WITH VITAMINS C & B-COMPLEX

Each c.c. contains all anti-anaemic principles and extrinsic factors from 15 gms of fresh sheep liver with added standardised vitamins B₁, B₂, B₆, C and Nicotinamide.

A product of TEDDINGTON CHEMICAL FACTORY LIMITED, BOMBAY
Sole Distributors: W. T. SURÉN & CO. LTD., P.O. Box 229, Bombay 1

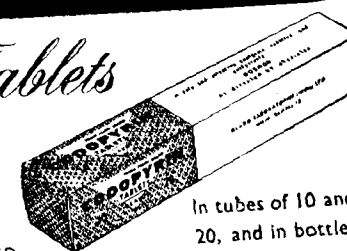
FOR RELIEF OF PAIN



Codopyrin, a safe and potent analgesic, combines acetylsalicylic acid, phenacetin and codeine in small doses which together reinforce each other and is an excellent example of powerful synergistic action. Codopyrin may be given without risks of ill effects over long periods. It quickly relieves moderately severe pains of neuritis, headache, rheumatism, influenza and dysmenorrhea. In addition, being an antipyretic, it rapidly brings down the temperature and also acts as a sedative.

CODOPYRIN

Tablets



In tubes of 10 and
20, and in bottles
of 80 and 300.

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

LAS. (B)

Copyright

simple answer



to complex deficiencies

BECADEX
TABLETS

Bottles of 25, 100 & 500

EACH TABLET PROVIDES:
Vitamin A 5,000 units, Vitamin B₁ 3 mg.
Riboflavine 2 mg.
Nicotinamide 20 mg., Vitamin C 30 mg.
Vitamin D 1,000 units
Calcium phosphate 250 mg.

GLAXO LABORATORIES (INDIA) LTD., BOMBAY CALCUTTA MADRAS

LAS. (B)

Copyright

... 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.

Experience proves that when the patient is deprived of salt its lack soon shows itself, sometimes by mental disturbances, or otherwise the patient soon develops adverse symptoms. These therefore may readily be avoided by ordering RUTHMOL which, in our opinion, has maintained its reputation ever since it was first put upon the market.

— 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%

Sole Agents in INDIA

THE ANGLO-THAI CORPORATION LTD.

Sole Distributors
HERBERTSONS LTD.

Ewart House,
Bruce Street, Fort,
BOMBAY 1.
1, Daryaganj,
Ansari Road,
DELHI.

Nathoolaji's Bldg.,
67-A Kings Way,
SECUNDERABAD (Dn.)
Stephen House,
5, Dalhousie Sq.,
CALCUTTA.

Manufacturers:
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.

Sole Agents in INDIA
THE ANGLO-THAI CORPORATION LTD.,

Sole Distributors
HERBERTSONS LTD.

Ewart House,
Bruce Street, Fort,
BOMBAY 1.

1, Daryaganj,
Ansari Road,
DELHI.

Nathoolaji's Bldg.,
67-A Kings Way,
SECUNDERABAD (Dn.)

Stephen House,
5, Dalhousie Sq.,
CALCUTTA.

Specify
OXOID
BRAND



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

Each Tablet Contains:

Aminophylline	1 gr.
Phenobarbital	1/6 gr.
Papaverine Hydrochloride	1/6 gr.
Base	q.s.

FORTE

Each Tablet Contains:

Aminophylline	1½ gr.
Phenobarbital	2 gr.
Papaverine Hydrochloride	1/2 gr.
Base	q.s.

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

A product of

PRIMCO LIMITED,

Lamington Chambers, Lamington Road, BOMBAY-4.

A "Wide-Spectrum" injectable

FOR MACROCYTIC ANEMIAS
of varied etiology

Pan Poielin Each cc. contains:

Crude Liver Extract containing Vit. B ₁₂	2 mcg.	Niacinamide	100 mg.
Folic Acid	5 mg.	Choline Hcl	35 mg.
Crystalline Vit. B ₁₂	30 mcg.	Methionine	25 mg.
Vit. B ₁	10 mg.	Inositol	1 mg.
Vit. B ₂	2 mg.	Phenol (Preservative) 0.5%	

NATIONAL PHARMACEUTICALS
P.O. Box 1901, BOMBAY 1

AVAILABLE IN 10 cc. VIALS

Pan Poielin

CASEO-ZYME

The hydrolysates of Casein and Yeast amply enriched with B Complex Vitamins and Lipotropic factors for successful Protein Therapy

*

Each fluid ounce contains

Amino Acids	... 20% w/v
Proteolytic Enzymes	... 250 mg.
Vitamin B ₁	... 5 mg.
Vitamin B ₆	... 2 mg.
Methionine	... 200 mg.
Choline	... 200 mg.
Inositol	... 50 mg.

*

ASSOCIATED DRUG CO. LTD., Yercaud, S. INDIA

OPIL

SYRUP WORMOPIL

Containing
500 mg. of Piperazine hydrate per fluid drachm

For
**Effective and Non-toxic Treatment
IN THREAD WORM**

Supplied in bottles of 2 oz., 4 oz. & 16 oz.

Oriental Pharmaceutical Industries Ltd.,
64-66, Tulsi Pipe Road — Mahim — Bombay-16



RAMTIRTH BRAHMI OIL

AYURVEDIC PREPARATION

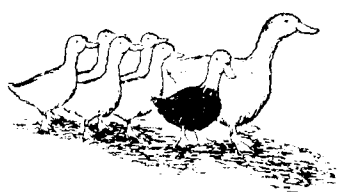
- Indicated in baldness
- Stops falling of hair
- Useful to everybody in all seasons



SHRI RAMTIRTH YOGASHRAM
DADAR (C. RLY.) BOMBAY 14

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).



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.

WR 4

LIQ. ALKACITRON

(Di-Sodium Hydrogen Citrate)

*

A pleasant and palatable blood alkaliser, which does not interfere with the normal digestive process. It maintains the natural alkali reserve of blood

*

For particulars please contact:

GLUCONATE LIMITED,
115, Prinsep Street, CALCUTTA-13

Rational liver extract therapy

Can Vitamin B₁₂ and folic acid
replace LIVER EXTRACT?

PROLEX

Will's Factor or other multiple factors
Essential amino acid & Tyrosine
Whipple's Factor
Minerals (Fe, Cu, Cobalt)
Vitamin B₁₂ and B₁₂ Complex
Folic acid and B-Vitamins Thymine
Thymidine
L. Citrovorum factor
All present in PROLEX obtained
from liver after proteolysis

Is the answer to the question.
PROLEX contains all the
natural hæmatopoietic factors
of WHOLE liver and cannot
be replaced by any artificial
mixture of vitamins.

Indication: In intensive treat-
ment of Anæmia—Macrocytic,
Megaloblastic & Pernicious type
In Pregnancy.

Mode of Issue: 2cc. & 5cc. ampoules in packs of 6, 12 & 50. 10cc. R/C. Phials.

BENGAL IMMUNITY CO. LTD. CALCUTTA-13



VITA-FOLIC

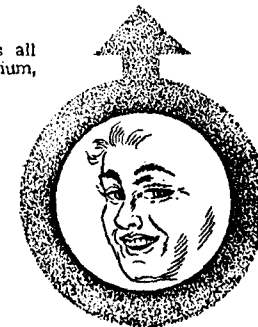
VITAMIN TONIC WITH FOLIC ACID

**BUILDS CELL NUTRITION
& IMPROVES METABOLISM**

Vita-Folic, a highly nutritive tonic supplies all essential vitamins in high dosage and calcium, iron and phosphorus 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 bronchi, 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 13



To Normalise **MENSTRUAL ABNORMALITIES**
OF VARIOUS KINDS FROM
FUNCTIONAL & GLANDULAR
DISORDERS

Re **HORMOSOKA**

Contains
A.S.O.K.A. GLAND EXTRACTS
OF ANT. PITUITARY
THYROID & OVARY

**PERFECT
CYCLE**

VEGETABLE LAXATIVE, DECONGESTIVE,
ANTISPASMODIC, SEDATIVE & TONIC

BIRLA LABORATORIES, CALCUTTA



GUIDANCE...

Guidance on methods of family planning is often welcome and does much to remove anxiety and promote a patient's mental and physical well-being. The modern contraceptive, GYNOMIN, inspires confidence with its high spermicidal efficiency. GYNOMIN is absolutely harmless to health, non-greasy and clean in application, and keeps perfectly in all climates.

Medical literature & samples
gladly sent on request

Formula No. C.D.L. 1040.

The scientifically, balanced antiseptic
deodorant contraceptive tablet

GYNOMIN

COATES & COOPER LTD West Drayton,
Middlesex, England.

Distributed by: P. H. KHANSAHER & CO. LTD., P.O.B. 2303, BOMBAY.
JADAWJEE & CO., 71 CANNING STREET, CALCUTTA.
ASSOCIATED BUSINESS CONCERNS LTD., P.O. BOX 1704, MADRAS.

PROGRESSIVE HORMONE THERAPY

UNICHEM

presents combinations of Hormones
for widened clinical use in

Functional Hormonal Disturbances in women

ESTROPROGYN

Estradiol Benzoate 2.5 mg.
Progesterone 25 mg.
per cc. in oily base with
1.5% Benzyl Alcohol

UNITRISTERON

Progesterone 25 mg.
Testosterone Propionate 25 mg.
Estradiol Benzoate 2.5 mg.
in 2 cc.

UNICHEM LABORATORIES
BOMBAY-26



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).

For the therapy
and
prophylaxis
of
MALARIA

'Resochin'

the most rapid and effective
chemotherapeutic available,
colourless and well tolerated

(does not produce resistant
strains of the parasite).

For parenteral therapy

'Resochin' 5% solution

in cases of incomplete or delayed intestinal absorption
in clinical emergencies.

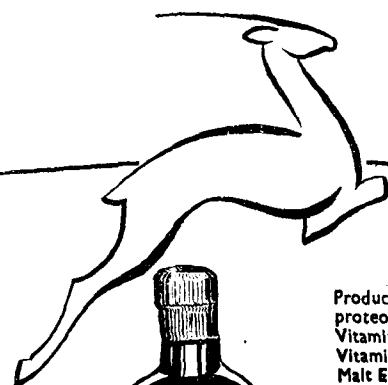


"Bayer"

Leverkusen, Germany

Sole Importers in India:
CHOWGULE & CO. (HIND) LTD.,
P. O. Box 1478, Bombay-1
Branches:
P. O. Box 8943, Calcutta-13 P. O. Box 1743, Madras-1

Sani-Vidol



COMPOSITION
Each Fluid oz. (30 c. c.) contains:

PLAIN (Alcohol 12%)

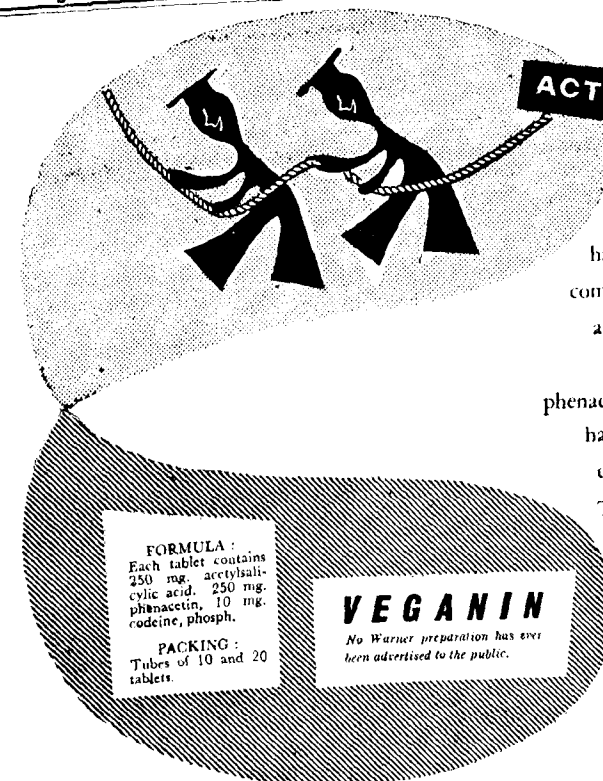
Products obtained by the enzymatic action of
proteolytic ferments on Liver and Spleen.

Vitamin A	..	7.5 gms.
Vitamin D	..	12,000 I. U.
Malt Extract	..	1,500 I. U.
Glucose	..	1.5 gm.
Sodium Hypophosphite	..	1.5 gm.
Calcium Hypophosphite	..	90 mg.
Gualacol	..	150 mg.
Syrup of Wild Cherry	..	0.12 min.
Tincture Gentian Co.	..	1.5 c.c.
Syrup with Aromatics q. s.	..	0.75 c.c.

COMPOUND (Alcohol 12%)

Added with Creosote 0.132 min.

Literatures from
THE SANITEX CHEMICAL INDUSTRIES LTD.
BARODA, S.



ACTING IN UNISON

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. acetylsali-
cyclic 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.

PREPARED BY
WILLIAM R. WARNER & CO. LTD.,
London, England.

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

WR 8

RYBARVIN INHALANT for ASTHMA

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



Manufactured
in England
by
**RYBAR
LABORATORIES
LTD.**

ASK FOR LITERATURE FROM:-
Sole Distributors for India

H. MUKERJI & BANERJEE SURGICAL LTD.
39/1, COLLEGE STREET, CALCUTTA - 12
and at ASUTOSH BLDG., CAL. UNIVERSITY

Sole Stockists for Bombay & Saurashtra
KEMP & CO., LTD.

88C, OLD PARSHADEVI ROAD, BOMBAY - 28

Sole Stockists for South India

SPENCER & CO., LTD.
MOUNT ROAD, MADRAS - 2

Sole Stockists for Delhi & East Punjab

BHAGWAN DAS & CO.
CHANDNI CHOWK, DELHI

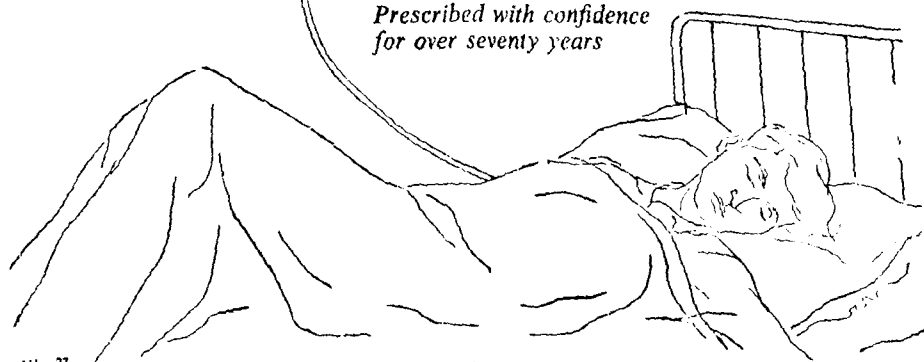
diet in
surgical
cases

Some nutritional disturbance is unavoidable in surgical operations, but this can be reduced to a minimum if due regard is paid to pre-operative diet. Horlicks, a food drink, helps surgical patients to make better progress by supplying readily absorbed mixed carbohydrates necessary for the maintenance of the glycogen reserves. The toxicity due to anaesthesia is lessened, the risk of post-operative vomiting is reduced.

The balanced nourishment of Horlicks materially assists recovery. It has a soothing effect which promotes restful sleep.

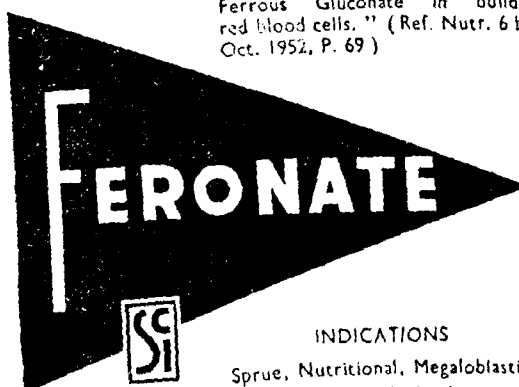
HORLICKS

*Prescribed with confidence
for over seventy years*



FOR BUILDING RED BLOOD CELLS.

★ Recent clinical investigations have proved that COBALT GLUCONATE, the only organic salt of Cobalt, which has close relationship with Vit. B₁₂, in specific dose enhances the action of Ferrous Gluconate in building up red blood cells. (Ref. Nutr. 6 bs. V. 13 Oct. 1952, P. 69)



INDICATIONS
Sprue, Nutritional, Megaloblastic
Hypochromic and all other types
of anemias

Each tablet contains:

Ferrous Gluconate	325.0 mg.
* Cobalt Gluconate	25.0 mg.
Copper Sulphate	0.5 mg.
Mn. Hypophosphite	0.5 mg.
Folic Acid	1.75 mg.
Vitamin B ₁₂	5.0 mcg.
Vitamin C	25.0 mg.
Vitamin B ₁	3.0 mg.

PACKING

In bottles of 25, 50 and 500 tablets

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

'CHOLECTRINA'

(Dehydrocholin B.D.H.)

For 'biliousness', 'liverishness',
flatulent dyspepsia and constipation associated with
biliary insufficiency

Portis and King (J.A.M.A. March 29, 1952) have reported
that a tendency to hard or firm stools may be overcome by producing
the normal laxative for the digestive tract — that is, bile.

Choleresis is induced with dehydrocholic acid and the dosage of
Cholectrina recommended is two tablets at mealtimes.

Tablets containing 0.25 gramme in bottles of 20 and 100
Boxes of 6 ampoules containing 2 grammes in 10 ml.

Literature and samples are available to physicians on request

THE BRITISH DRUG HOUSES LTD. LONDON

Representatives in India: BRITISH DRUG HOUSES (INDIA) LTD.
Post Box 1341, Bombay-1 Branches at: Calcutta - Delhi - Madras

Prescription for Recovery

"Take  twice a day"

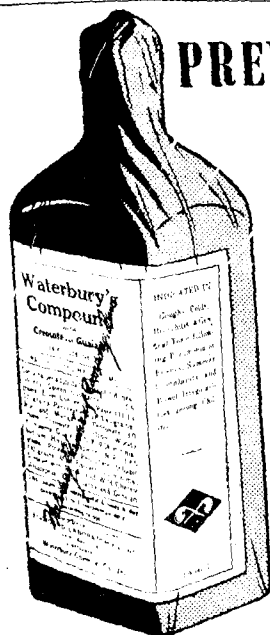
Wincarnis has proved extremely beneficial as a tonic after
illness. It is a digestive acceptable to the weakest stomach, and
palatable enough for the most reluctant appetite. Wincarnis acts
as a gentle stimulant which helps the patient to renewed vitality
and the more active mental condition so important in recovery.

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

WINCARNIS

over 25,000 recommendations
from Medical Men

COLEMAN & CO. LTD., WINCARNIS WORKS, NORWICH, ENGLAND



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 guaiac 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

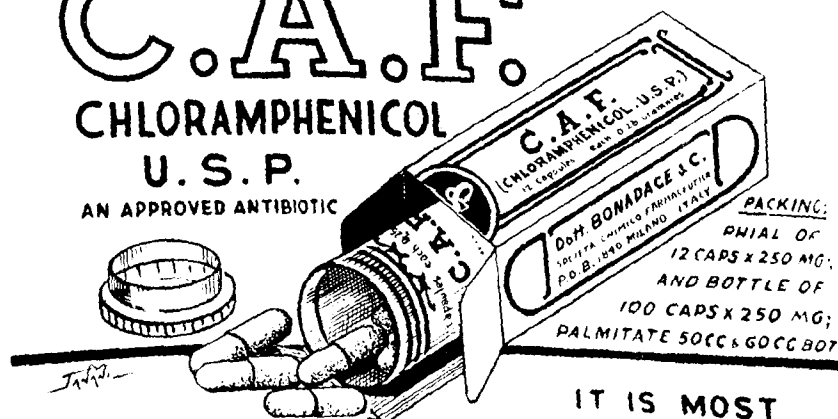
MARTIN & HARRIS LTD.
Mercantile Buildings, Lall Bazar, Calcutta. Also at Bombay, Madras and Delhi
Made in England by VINCE LABORATORIES Ltd., London, W. 4

WR-1

C.A.F.

CHLORAMPHENICOL
U.S.P.

AN APPROVED ANTIBIOTIC



IT IS MOST
RELIABLE and ECONOMICAL
IN THE TREATMENT OF VARIOUS BACTERIAL INFECTIONS.

LITERATURE ON REQUEST

SOLE IMPORTERS FOR INDIA: **AMARCHAND SOBACHAND, POST BOX NO. 518, MADRAS-3.**

- STOCKISTS:
1. M/s. NATH & CO., Princess St., Bombay-2
 2. M/s. MEDICINE TRADERS, Chandni Chowk, Delhi-8
 3. M/s. PREMIER MEDICAL SUPPLIES & STORES, 44/45, Ezra St., Calcutta-1

Nutritive Aid
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 LIMITED, CALCUTTA-4

Mg. L. No. DL 62 M
DL 42 MB

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	1000-01 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, Eucalypt. 0.7%
Invert Sugar, Glycerine,
Malt & Aromatics q.s.

STADMED LTD.
15, JAWPORE ROAD,
CALCUTTA-30

Ergoapiol-(Smith)

A Menstrual Regulator...

When the periods are irregular, due to constitutional causes, ERGOAPIOL (Smith) is a reliable prescription. Containing apiol (M.H.S. special) together with ergot and oil of savin of the highest quality, this preparation effectively stimulates uterine tone and controls menstrual and postpartum bleeding.

In cases of Amenorrhea, Dysmenorrhea, Menorrhagia and Metrorrh.

hagia, Ergoapiol serves as a good uterine tonic and hemostatic. Valuable in obstetrics after delivery of the child.

DOSAGE: 1 to 2 capsules 8 or 4 times daily. Supplied only in packages of 20 capsules. Literature on request.

As a safeguard against imposition the letters MHS are embossed on the inner surface of each capsule, visible only when the capsule is cut in half at seam as shown.



MARTIN H. SMITH COMPANY
NEW YORK, N.Y.

*As
anti-anaemic
agent*

Marmite has proved of specific value in India in the treatment of nutritional macrocytic anaemia, and in the sprue-like syndromes common in the tropics. As the incidence of this type of anaemia is high, especially in pregnancy, and accounts for many maternal deaths, Marmite is prescribed widely for its haemopoietic properties.

*In
deficiency
diseases*

In cases where the B₂ vitamins are indicated, therapeutically or prophylactically, Marmite is often the product of choice. It is a vegetable foodstuff providing a full complement of the known B₂ components, and also possibly unknown factors of significance. The combined action of the various vitamins given together as they occur naturally in Marmite is usually considered particularly advantageous.

MARMITE

yeast extract

Contains:—Riboflavin (vitamin B₂) 1.5 mg. per oz. Niacin (nicotinic acid) 16.5 mg. per oz.
Manufactured in England by THE MARMITE FOOD EXTRACT CO. LTD.
Distributing Agents: J. L. Marison, Son & Jones (India) Ltd., P. O. Box 6527, Bombay, 26

472



HEMOLIVIT

For megaloblastic and hypochromic anaemias,
debility, malnutrition and convalescence

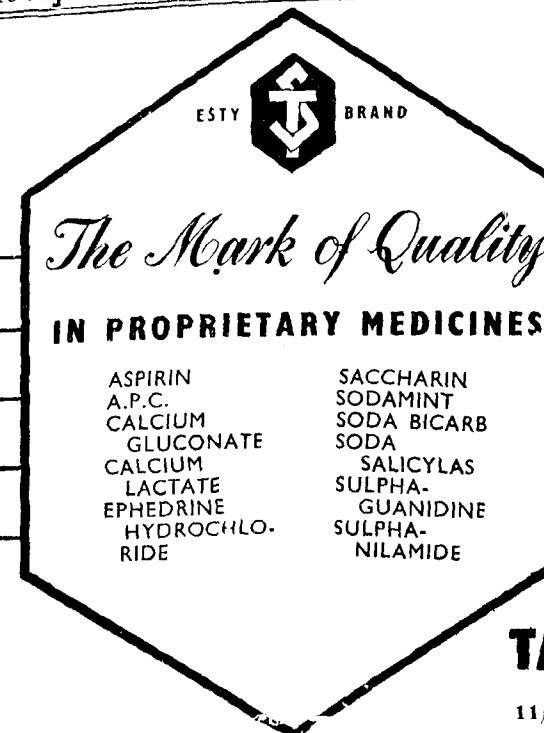
The manufacturing formula per fl. oz. is

Fresh Liver proteolysed	40 gm.	Cal. Pantothenate	8 mg.
Ferri et Ammon Cit	10 gr.	Vitamin B ₆	10 mg.
Vitamin B ₁	20 gm.	Folic Acid	3 mg.
Vitamin B ₂	4 mg.	B ₁₂	80 mcg.
Niacinamide	100 mg.	Cobalt Chloride	2 mg.

PACK: Bottle of 6 oz • Detailed literature on request.

SMITH STANISTREET & CO., LTD.

CALCUTTA • BOMBAY • MADRAS • KANPUR • PATNA • GAUHATI • NAGPUR



WRITE FOR PRICE LIST

TABLETS LIMITED

11/12, First Line Beach, Madras-1

18/2



BECALMED...

THE convalescent has successfully weathered the storm of acute illness but finds it difficult to recover from the aftermath. The patient is depressed, lethargic, is in fact in a state of being *becalmed*.

In such cases a good tonic is needed to speed the voyage to recovery, and many physicians have found the answer in Waterbury's Compound. Waterbury's supplies easily assimilable iron, supported by manganese, calcium and phosphorus in rational proportions to ensure proper metabolic utilization. In addition, Waterbury's makes available guaiaac and creosote as tasteless, odourless sulphonates, readily acceptable even to

finicky patients.

**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

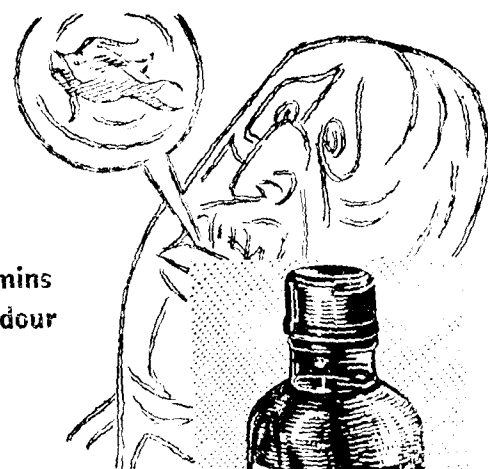
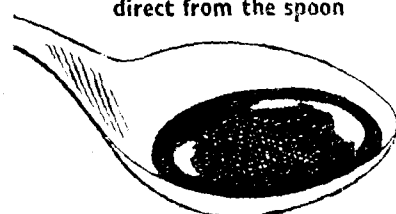
WB 20

for the
sensitive
ones.....

vitamins
without fishy odour
& smell....

PANLYN

direct from the spoon



Each average teaspoonful
5 c.c. Contains:

Vitamin A	5000 I.U.
Vitamin D	500 I.U.
Thiamine mononitrate	3 mg.
Riboflavin Soluble	3 mg.
Sod. Pantothenate	2 mg.
Pyridoxine Hydro- chloride	1.5 mg.
Nicotinamide	30 mg.
Ascorbic Acid	75 mg.
Acetyl Menthionine	5 mg.

In 2 oz. & 4 oz. Phials.

PANLYN

DELICIOUS LIQUID
MULTIPLE VITAMINS

THE CALCUTTA CHEMICAL CO. LTD., CALCUTTA-29.

For Hepato-biliary disorders

colibil



Each fl. oz. of Colibil contains:

Choline Chloride	1.5 Gm.
Desiccated Whole Bile	150 mg.
Dehydrocholic Acid	100 mg.
Proteolysed Liver Ext. eq. to 40 Gms. of fresh liver	

In a base composed of Pharmacopoeial and Indigenous drugs known as efficient hepatic stimulants and cholagogues.

Available in 2 oz. & 4 oz. phials.
Also COLIBIL with METHIONINE is available.

THE CALCUTTA CHEMICAL CO. LTD.,
CALCUTTA-29

South India Office: 5/149, Broadway, Madras.

The Antiseptic

A Monthly Journal of Medicine and Surgery
Published on the 8th of every month

Founded by the late Dr. U. RAMA RAU in 1904

Editor: U. KRISHNA RAU, M.B., B.S., M.L.A.

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

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

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

Vol. 52

MAY, 1955

No. 5

Original Articles

TRENDS IN PHARMACOLOGICAL RESEARCH*

R. B. ARORA, M.D. (Med.), M.D. (Pharm.),

Professor and Head of the Department of Pharmacology and Experimental Therapeutics,
Sawai Man Singh Medical College, Jaipur

CHEMOTHERAPY, which was to become one of the most important branches of medical science, received its first impetus in 1902 when Ehrlich gave us Salvarsan. In the same year, two English physiologists introduced hormones into the medical armamentarium. The first sulpha drug was prepared in 1908, although its therapeutic value was not realised till about 25 years later. The first of the vitamins, widely recognised as the first line of defence against deficiency diseases, was announced in 1901. And in 1928, the late Sir Alexander Fleming gave penicillin to the world and opened the field of antibiotics.

Pharmacological research comprises two groups: the first includes the study of the final effects, the second the study of the basic mode of action of chemicals, including drugs. The study of the final effects implies the observation of the symptoms produced and their analyses. The results obtained in this field have revealed the character of the functional changes provoked. The second field of research aims at the final goal of pharmacology as a biological as well as medical science, revealing the nature of the primary interaction between drug and cell.

Many valuable drugs were known and used long before the advent of scientific research. Progress in research has resulted in the understanding of drug actions, and the development of new compounds. The recognition, for instance, of the effectiveness of sulphhydryl-containing compounds against arsenic poisoning led to

* Specially contributed to the Golden Jubilee issue of the ANTISEPTIC

the discovery of BAL (British Anti-Lewisite). On the whole it may be a long time before we shall be able, in searching for new therapeutic agents, to replace empirical methods by scientific ones.

A comprehensive working hypothesis to serve as an explanation for the action of drugs on cells became desirable a century ago when, for the first time, cells were described by Schleiden and Schwann. The first systematic approach to this subject was the classical work of Crum Brown and Richard Fraser who in 1869, demonstrated the curariform action of quaternary ammonium bases. Since then many theories have been propounded, some of them to include the actions of only a limited number of compounds eliciting similar responses, such as narcotics, while others more comprehensive in their scope have attempted to embrace both the stimulant and depressant actions of drugs. Among the many concepts that have held the field, the following seven deserve mention:—(1) the Meyer-Overton theory of narcosis 1901; (2) the Straub theory of potential difference 1907; (3) the phasic theory of cell response, Clark 1937; (4) Bancroft's interpretation of the theory of Claude Bernard, 1931; (5) the active patch concepts (Clark) 1933; (6) the application of Freundlich's isotherm (Clark) 1937 and (7) the application of the principle of Le Chatelier Krantz, 1940.

With seven or more concepts of the action of drugs producing only quantitative responses of cells, our knowledge of the exact nature of drug action is still elementary.

Investigations on cell permeability during recent years, have led to the recognition of mechanisms which explain many old and new observations as well as the mode of action of important drugs. Nobel Laureate, Prof. Otto Loewie (1951) an authority on cellular pharmacology feels that these recently discovered principles of cellular pharmacology will continue to exert a dominant influence on future research.

The elucidation of the mechanisms involved has according to Prof. Otto Loewie revealed how important cell nutrients, like glucose and amino-acids reach the cell interior and how drugs interfere with that mechanism.

For a long time it had been recognized that the accumulation of substances within the cells against a concentration gradient cannot be due to a passive process like diffusion, but depends on an active energy-yielding process. Only during recent years, has the true nature of this process been disclosed. It has also been shown that in some cases even the uptake of substances from their medium is dependent on a source of energy. Shapiro (1947) while analysing the mechanism of the action of physiological doses of phlorizin known to inhibit reabsorption of glucose by the convolute tubuli of the kidneys, found that the dehydrogenase systems which supply energy-rich phosphate bonds are inhibited both *in vitro* and

in vivo. The dependence of the uptake of glucose by the kidney cells on a metabolic process was thereby proved. Phlorizin also inhibits the reabsorption of some dyes by the kidneys (Ellinger 1937). The same mechanism is no doubt involved, in addition to diffusion, in the uptake of glucose by the intestine which is also inhibited by phlorizin (Verzar *et al* 1935). The kidneys and intestine are, to our knowledge, the only organs in which phlorizin inhibits the absorption of glucose.

Wilbrand (1940) observed that the addition of sodium fluoride or iodoacetate, which inhibits glycolysis, is followed by a considerable loss of potassium ions, from mammalian red cells. That this inhibition of glycolysis is directly or indirectly responsible for the change of permeability as revealed by the release of the potassium ion, was proved in different ways. The transport and accumulation also of another nutrient, glutamic acid, against a concentration gradient was shown to occur only in the presence of an energy-yielding substrate. This finding by Gale (1947) led him to the discovery of a pertinent mode of action of penicillin. Searching for a biochemical relation essential for gram-positive bacteria for which, (in contrast to gram-negative) penicillin is extremely toxic he found that only gram-positive bacteria depend to a large extent on a supply of amino-acids in the culture medium. He observed that the mechanism of the uptake by bacteria is different for different amino-acids. Some pass from the medium by a passive diffusion process; others, like glutamic acid, are transported and accumulated actively by an energy-consuming metabolic reaction. This suggested that penicillin which acts selectively against the gram-positive bacteria might act here by finally inhibiting amino-acid assimilation. Gale and Taylor (1947) found that penicillin did inhibit the uptake of glutamic acid.

In recent experiments with radioactive penicillin it was found exclusively in the plasma of bacterial cells, and it was therefore confirmed that the impermeability to glutamic acid is not due to a direct influence of penicillin on the cell-wall.

Finally, it should be mentioned that the thyroid gland accumulates iodide and this function is inhibited by thiocyanate.

All these findings go to show that the important cell-permeability is not an inherent and constant physical property of the cell-surface but is controlled by an energy-yielding processes (Otto Loewi 1950).

It seems obvious that the cells, in order to maintain their proper function, deliver energy for the transfer of such substances as potassium ion, iodide ion, glucose and amino acids which are normal cell-constituents, and which are required for metabolic activity. The principle of active transfer offers a potential theme for future research and the concepts which contribute

to the problem of affinity between drug and cell are often of the greatest importance in all investigations.

The affinity depends ultimately on the chemical structure of the drug and/or on its steric and/or its spatial configuration, as these factors determine the chemical and/or physiochemical properties of the drugs and the nature of their interaction with the reactive sites of the cell.

Narcotics have an affinity for and an effect on the cells solely because of their physiochemical properties. Many drugs act through chemical affinity to surface elements. There exists, however, a third and by far the largest, group where the affinity must be due either to properties hitherto unknown or more probably to spatial configuration. This becomes evident by the fact that drugs having the same chemical composition may have quite a different affinity, and, therefore, exert a different action, as for example, the different action of optical isomers as first disclosed by Pasteur. In some cases we are familiar with the nature of the differences in configuration; in others, we are not. For instance, we almost entirely lack this knowledge in regard to active proteins and other agents with a high molecular weight. It is obvious that here the difference in affinity and action must depend on structural differences which are not revealed as differences in composition. We may quote the classical finding of Avery *et al.* (1944), who were able to produce transformations in certain types of pneumococcus by adding to the medium desoxyribonucleoproteid obtained from the latter type, though this is chemically indistinguishable from the desoxyribonucleoproteid of the first type. Furthermore, it has been shown recently that the highly purified growth-hormone is composed of the same kinds of amino-acids in almost the same proportion as is blood protein, (Franklin 1947). Finally in quite a few cases the comparison of the composition of extremely effective toxins with that of crystalline serum-albumin showed definitely that the chemical differences provide no obvious clue as to why one protein is toxic and another is not, (Pappenheimer 1947). In all these cases the difference in activity must be due to still unknown properties or to a different configuration of the respective molecules. Obviously, only those will be active where an affinity exists between (and hence combination) drug and receptor. This presumes that the configuration of the surfaces of drug and receptor fit together, showing that they are complementary.

The idea that a complementary configuration of the surface and agent and substrate is responsible for affinity and combination, as first pointed out by Emil Fischer in regard to the interaction between enzyme and substrate and later by Paul Ehrlich in regard to the interaction of antigen and antibody has in our days been resumed and stressed by Linus Pauling who reported that agents of quite different chemical character may display the same affinity and the

same action on the specific cell substrate and that this is due to the fact that their molecules have the same size and shape. This concept deserves serious consideration.

With the rapid expansion of our knowledge of enzyme activities our knowledge of the mode of action of a few drugs which influence enzyme activity has also been advanced.

Chemicals may block the activity of enzymes by combining and reacting with essential constituents. Magnesium ion is a co-enzyme of the magnesium fluoro phosphate complex combining with enzyme protein. A classical case of enzyme blockade is that produced by the action of arsenicals *e.g.* the action of arsphenamine. Its discovery resulted from the systematic attempt of Ehrlich to combat parasites in the living tissue by means of chemicals. In 1908, while discussing the possible nature of the combination of an arsenical with the cell constituents, he mentioned the sulfhydryl groups—Ehrlich (1909). Voegtlin and Rosenthal (1931) deserve credit for adducing proof that sulfhydryl containing agents antagonize to a certain extent, the action of arsenicals. Since that time our knowledge of the importance of the sulfhydryl group, in enzyme activity has been greatly increased. A large number of enzymes playing an important part in the intermediary metabolism have been shown to contain sulfhydryl groups on their protein moiety which is essential for their activity.

Another kind of interference with enzyme activity is produced by agents which are structural analogues to prosthetic groups of enzymes and which compete with them for the enzyme, thereby, preventing its active synthesis. This principle of the mode of action of some agents was first discovered with the sulphonamides whose action consists in competing with PAB in the enzymatic synthesis of pteroylglutamic or folic acid, a constituent of the vitamin B complex and supposed to be a prosthetic group of an enzyme. A great many analogues of B vitamins have been synthesized since this observation.

Vitamins are essential for growth. Accordingly, many attempts have been made within the last few years to find out whether vitamin deficiency as produced by structural analogues of vitamins, called anti-vitamins, would influence the growth of neoplastic diseases. In fact some antipyridoxines and antifolic acids proved to be effective in some cases to a moderate degree. The same, by the way, seems to be true of nitrogen mustard and its derivatives whose mode of biochemical action is very different to that of the antivitamins. The hitherto available compounds of both groups, however, have been much too toxic for extensive therapeutic use. Suitable non-toxic ones may perhaps be developed in the future. The concept of metabolic antagonism seems to be a rational approach to chemotherapy of the neoplastic diseases.

In addition to the agents which block enzyme activity there are quite a few which, because of a structure analogous to that of substances physiologically acted upon by an enzyme, compete with them for an enzyme and hence inhibit its action. A case of this kind is that of eserine which competes with acetylcholine for the enzyme cholinesterase; eserine is the only alkaloid so far known whose symptomatology and mode of action are fully explained by its influence on an enzyme.

In the course of the discussion on the mechanism of some drug action, reference was made to arsphenamine, sulphonamides and penicillin, because a knowledge of their mode of action has contributed to our knowledge of the general principles which govern the mechanism of drug actions.

The experimental approach by Koch in 1822, in dealing with anthrax-infected guineapigs by using mercuric chloride—a protoplasmic poison, led the way to the treatment of infectious diseases by drugs which exclusively interfere with the metabolism, nutrition and growth of the infecting bacteria. The control of viral infections on the same lines is now receiving considerable attention and research.

In other diseases attempts are directed at restoring the disturbed functions in man. From ancient times many natural drugs have been available for this purpose, and during the last century many have been manufactured on the basis of experimental research and their specific action on various organs systematically studied *e.g.*, contraction of muscles, secretions in glands, activity of nervous elements, and so on. To this group of organotropic drugs belong most of the alkaloids, glucosides, steroids, cations, some hormones and other agents. Many of them act quickly and specifically even in minute doses when used in a very specific way. This fact is understandable only on the assumption that the reacting specific cell constituent occupies only a minute part of the cell; this would fit in with the concept that the receptor is an enzyme.

Some enzymes act very quickly, and the hypothesis has been advanced that any substance which induces profound biological effects in trace amounts does so either by participating in or by specifically affecting some enzyme system. No evidence has been adduced for this hypothesis. Nobody would contend that the effect of an electrical stimulus on cells is initiated by an effect of the current on an enzyme. It is generally accepted that an electrical stimulus acts primarily on cells by changing their polarized state and that this change alters the permeability for ions, thereby producing electrical potentials initiating all the changes which affect the cell functions. Now it has been shown that both acetylcholine and epinephrine primarily change the polarized state of the cells. Where they inhibit the functions they act by anodic stimula-

tion, increasing the polarized state; where they augment the function they act by cathodic stimulation, producing depolarization. At least in these two cases the drug is effective in extremely small amounts and its action is not due to a primary reaction with enzymes. This is likely to be true for a great many other drugs acting on specific organ-functions. Hickman (1949) was right to a certain extent when, in discussing the mode of action of vitamin E, he said: "Today we are hunting for a vitamin E enzymic function. Anyway, we know much less about the mode of action of organotropic drugs than we know of antimicrobial drugs. The reason is clear. Antimicrobials act not on specific but on general metabolic functions. We can, however, disclose the mechanism of a drug-action only if we have some detailed knowledge of the system which it affects. This holds true to a certain extent for metabolism."

Besides the antimicrobials we know of quite a few other drugs which influence definite steps of intermediary metabolism; to mention a few, fluoride ion, iodoacetic acid, cyanide, denitrophenol, sulphydryl reagents, phlorizin, analogues of vitamins, etc. All of them interfere with the activity of special enzymes. If they should be used in a more systematic way than hitherto, one could predict that they may become valuable tools in the exploration not of the primary action of drugs but of metabolic conditions needed for the sequence of events following the primary action.

These drugs have been mostly studied in homogenates. If we want to study them with intact cells we have to bear in mind that their effect will be modified by regulatory mechanisms. In the intact cell, enzyme processes are interconnected and run according to need. There are various conditions limiting the maximal activity of enzymes which far from being recognized and, as a rule, cannot be studied in homogenates. An important exception was reported by Cori (1946). Carbohydrate utilization is not maximal even in normal animals and men, otherwise it would not be raised by the administration of insulin. Among the physiologic inhibitors are hypophyseal and adrenocortical factors. Cori (1947) came to this conclusion from the results obtained with extracts of organs. This, by the way, was the first case apparently demonstrating the mode of action of a hormone on a cell-free extract. It is difficult to predict whether other metabolic hormones also, for example, thyroxine might not act by removing physiologic inhibitors of enzyme activity.

Physiologic inhibitory mechanisms obviously are in no way restricted to enzymatic processes but play a part in the regulation of all physiological functions. Without them life cannot exist or be maintained.

It is well known that a number of drugs stimulate in small but inhibit in large doses. Some enzyme-inhibitory drugs, given in

small doses, increase metabolic activities. Small doses of sulfhydryl reagents, for example, increase the oxygen consumption in sea-urchin eggs. Barron (1948) has advanced the attractive hypothesis that they might do so by combining with and thereby inactivating soluble nonfixed sulfhydryl groups, as in glutathione, which regulate the rate of respiration by regulating the rate of reoxidation of the cytochrome system.

In the field of bacterial metabolism quite a few mechanisms exist by which the effect of enzyme inhibitors can be overcome. They are the basis for the hypothesis that microbial resistance will be fundamental for both cellular physiology and application of antimicrobials in man.

We have seen that among the mechanisms by which drugs interfere with enzyme activities, competition for the same substrate plays a big part. The substrate for which two agents compete does not necessarily have to be an enzyme or an enzyme constituent. Atropine and some quaternary ammonium bases and perhaps curare also compete with pilocarpine and other vagomimetic stimulants for the same receptor. Quite recently the hypothesis, based on some striking observations, was discussed as to whether cortisone would not in some way compete with desoxycorticosterone (Thorn (1949)). There is no evidence that in this case the substrate should be an enzyme. In discussing possibilities of the mode of action of drugs one should bear in mind the view stressed by Woolley to whom we owe much of our knowledge of structural analogues and their action. He has pointed out that quite a few drugs may act, as many enzyme inhibitors do, by competing with structurally related essential cellular elements at the site of their action and replacing them and thereby decreasing or increasing cellular functions according to the specific case.

Experimental pharmacology and measurement of the subjective response.—Henry K. Beecher an authority on the subject of *Experimental Pharmacology and Measurement of the Subjective Response* says that—"Experimental pharmacology in the past has dealt largely with phenomena that can be measured objectively in response to drug administration, with changes in the heart rate, rises or falls of blood pressure, neuromuscular action, and so on. Such experimental studies have usually been carried out in animals, and the basic controls have been observed in most cases. On the other hand, relatively little attention has been given to the nature of the controls that are essential in order to elicit true and clear information concerning subjective responses to drugs. Such work must usually be carried out in man."

The need for measurement of subjective responses will be clearly seen if we surveyed the general growth of medicine in recent years. It has served indirectly to emphasize particular fields in which development has lagged behind. Notable for example, is the

slowness of its growth in experimental psychiatry, mostly due to the fact that pharmacology, as it deals with the subjective responses has not been given the attention it deserves.

The experimental biochemistry, physiology, and pharmacology of the future will concern themselves to an increasing extent with man and his subjective responses, as opposed to objective responses. The investigations and studies into this vast field of research will necessarily involve considerable labour, time and money, but if properly conducted are bound to yield valuable results.

Clinical pharmacology.—In an editorial in the *American Journal of Medicine* for June 1952 headed "The Proper Study of Mankind is Man," Harry Gold forcefully discusses this branch of pharmacology.

It is not a new science. William Withering's painstaking clinical studies on foxglove during nearly ten years in the latter part of the eighteenth century are well known.

The comparison of therapeutic agents, qualitatively, and quantitatively, *i.e.*, the bioassay of drugs forms an important part of clinical pharmacology, *e.g.*, studies on curare, cinchona compounds, khellin, the human bioassay of digitalis, comparisons on the tolerance of children and adults to members of the digitalis group and bioassay of diuretic agents in ambulant patients with congestive heart-failure. During World War II the shortage of quinidine led to a clinical comparison of quinidine and synthetic dihydroquinidine in the hope of utilizing the latter as a substitute in disorders of cardiac rhythm. Comparative studies by distinguished clinicians led them to the conclusion that dihydroquinidine was twice as potent as quinidine in man. A subsequent study in clinical pharmacology, a human bioassay, reversed the verdict, and proved that the potencies of the two compounds were indistinguishable in man. Animal experiments showed khellin to be very active in dilating coronary vessels, and several reports of clinical trials agreed that it was effective in controlling the pain of the angina of effort in patients with heart-disease. The first study applying the rules of clinical pharmacology discovered that patients could not distinguish khellin from sugar of milk by the effect on their cardiac pain. These results were not hailed with great enthusiasm, though they appeared to represent the cold facts rather than pious hopes. Reports have begun to multiply confirming them.

Interest in this aspect of biology and medicine was slow to develop, but there has been an awakening and accelerated activity during the past few years which, may gain further momentum.

Radioactive isotopes.—The use of radioactive isotopes as labels in pharmacological research has not been very wide so far but may expand when their usefulness in certain conditions and for certain diagnostic purposes comes to be appreciated (Wills, 1950).

There are two chief uses to which radioactive isotopes can be put in pharmacological research:—study of the reactions between drugs and other constituents of the animal body, and following the localization and fate of drugs in the body. Examples of the first use are found in the papers by Brauer and by Jandorf and McNamara. Jandorf studied the *in-vitro* reaction of the anti-cholinesterase compound, hexaethyl-tetraphosphate (HETP), labelled with radioactive phosphorus, with human plasma cholinesterase and reported that no radioactive phosphorus could be detected in the precipitated protein. He concluded, therefore, that a stable combination between the esterase and a phosphorus containing fraction of HETP is not formed. Jandorf and McNamara found that when DFP, labelled with radioactive phosphorus, is injected intravenously into rabbits, the level of the cholinesterase in the blood does not rise appreciably until elimination of radioactive phosphorus from the blood has started. This latter finding has led to further analysis of the reactions of DFP and its relatives with proteins.

Jensen *et al* found that when chymotrypsin is inhibited *in vitro* with DFP-containing radioactive phosphorus, there is incorporation of radioactive phosphorus into the protein molecule. They found that isopropyl groups from DFP are introduced also into the inactivated enzyme. Jandorf *et al*, have reported that radioactive phosphorus from tetraethyl-pyrophosphate (TEPP), which is also a potent inhibitor of cholinesterase and chymotrypsin and which is responsible probably for the activity of HETP, is incorporated into the inactivated enzyme. Brauer and Pessotti, using HETP labelled with radioactive carbon in position, have found that radioactive carbon is introduced into cholinesterase during inactivation, extending to cholinesterase the finding of Jensen *et al* that the alkyl group is incorporated into chymotrypsin. It appears, thus, that both the alkyl and phosphorus groups of the organic phosphorus cholinesterase-inhibitors react with the protein they inhibit. This reaction may involve loss by the enzyme of important components, such as active hydrogen atoms.

An example of an experiment in which radioactive isotopes are used for tracing the disposition within the body of molecules is found in an investigation by Simpson and Young of the absorption of BAL through the skin. The BAL was labelled with radioactive sulphur in the thiol-groups and was then spread on the skin surface. The disappearance of radioactive sulphur from the skin was followed and was found to indicate a skin absorption of BAL of about 0.4 mg. per square centimeter per hour. Another example, is the use by Albright, Tabern, and Cordon of the amœbicide chiniofon, made with radioactive sulphur, to study absorption and excretion of the drug. They found that chiniofon is absorbed rapidly from the gastro-intestinal tract and that within 48 hours

after administration of the drug about 60 per cent of the dose appears in the urine unaltered.

The radioautograph method, whereby the radioactive isotope is made to mark its own location in a tissue, has been described by a number of authors (*e.g.*, Belanger and Leblond). This method is capable of yielding the most precise localization of isotopes, emitting particles but can be used with those yielding other types of radiation if absolute intracellular localization is not desired.

In the branch of pharmacology which deals with biological assays, pharmacological methods are used to detect and measure substances, such as vitamins, hormones, bacteriological and immunological products, which cannot, in the first instance, be detected or measured in any other way, since chemical methods either do not exist or are much less sensitive than the pharmacological methods. Such assays have been used to control the chemical work which has led to the isolation and synthesis of so many vitamins and hormones for which therapeutic uses are gradually being found. When the active substance has been isolated and when its chemical structure has been established, it is sometimes possible to replace the biological assay by a chemical method which is simpler and more accurate. This has occurred with Vitamin C, which was identified as ascorbic acid and is now estimated colorimetrically; but it is not likely that this will be possible in every case. (Caddum 1942).

The methods of biological assay used in connection with the isolation of active substances are generally crude, but more accurate and specific methods have been devised for special purposes. There is no immediate prospect of a chemical test for insulin, and the successful use of this hormone depends entirely on biological assays. A great deal of complicated work has been done to make these assays accurate. The same is true of many other hormones and bacteriological products.

Another branch of work in which biological assays are used, and in which accurate and specialised technique are very important, relates to substances like histamine and acetylcholine whose chemical structures are known, but which are commonly present in concentrations too small to be assayed by chemical methods. Our knowledge of the physiology of acetylcholine, which has thrown so much light on the mechanism of nerve endings, is based on biological assays, since the quantities of acetylcholine liberated are so small that their presence cannot be demonstrated in any other way.

The application of these methods to the study of disease may well lead to interesting results. It has been shown, for example, that histamine is normally present in human blood and biological methods of estimating the blood histamine have been developed.

Some information is available regarding the changes in blood histamine in various pathological states, but our information is still far from complete.

Anti-accelerator cardiac agents—In the survey of substances which block the effects of stimulation of various autonomic nerves upon their effectors, no agents had come to light during the past 100 years which were capable of exerting in the mammalian heart a selective blocking action on the cardio-accelerator effect of sympathetic stimulation. This action apparently rests upon a peculiar biochemical property of the automatic tissue of the mammalian heart which requires a chemical counterpart not hitherto met with among natural (or synthetic) compounds. The recent finding by C. Kraye *et al.* (1946-1951) that certain alkaloids of a steroid nature, or related to it, exhibit such highly selective blocking action on the cardio-accelerator mechanism bears out this assumption. Substances with this property were first found among the naturally occurring veratrum alkaloids, *e.g.* veratramine, veratrosine, jervine and pseudojervine. The recognition of these alkaloids as selective blocking agents of the cardio-accelerator mechanism of the mammalian heart closes an important gap in the general scheme of the pharmacology of the automatic system.

The use of anti accelerator cardiac agents.—Substances with a selective antagonistic effect upon the positive chronotropic action of the sympathomimetic amines would have therapeutic usefulness, provided their therapeutic range was adequate. We do not possess at present the requisite experimental evidence to assess the therapeutic range in man of any one of the anti-accelerator agents, except that the experiments in mammals suggest a very narrow range between effective anti-accelerator action and toxic action in the intact animal.

A similar anti-accelerator action of veratramine has been recently established on the auriculo-ventricular nodal rhythm. (Arora, Malman and Kraye, 1952). The effect wore off gradually similar to the action of veratramine on sino-auricular node (Kraye, 1951).

It has been established by me that the anti-veratrinic activity of some compounds (*e.g.* cardiac glycosides and aglycones) is based on the same stereochemical and chemical requirements as the cardiac activity and a decrease in anti-veratrinic property goes parallel to the decrease in cardiac activity—(Arora, 1953 and Arora and Kraye, 1952). It was also shown by Kraye (1950) that the cinchona alkaloids, quinine and quinidine have anti-accelerator cardiac activity. It is also known that the cinchona alkaloid quinine possesses an anti-veratrinic action and is useful in certain forms of myotonia (Wolf 1936).

It is quite possible that the finding of the chemical configuration of cinchona alkaloids responsible for its anti-veratrinic action

may lead us to compounds useful clinically not only in some skeletal muscle disorders but also in diseases of the cardiovascular system.

The interest in anti-accelerator cardiac agents is heightened by the importance of the site of their selective action. It is at least probable that such substances will be useful tools in the elucidation of the mechanism by which the sympathomimetic amines and accelerans stimulation, increase the rate of impulse generation in the automatic tissue of the heart.

Action of general anaesthetic agents on the automaticity of the atrioventricular node.—Invariable affection of the cardiovascular system to a greater or lesser extent during anaesthesia necessitates a detailed knowledge of the mechanism of action of general anaesthetics on the automaticity of the heart and the various potentiating and antagonistic factors in this respect, in order to avoid catastrophes. Any investigation done on the subject has been on the intact mammalian heart with S. A. node responsible for the rhythm. Practically no work has been done abroad or in India on this subject.

What is the cause of ectopic beats and abnormal cardiac rhythm like automatic heart? is it an escape phenomenon due totally to depression of pace-maker? or is it due to the excitation or increased irritability of the lower centres of rhythmicity? or is it that they are due to the escape of excited or irritated lower centres made possible by the coincident depression of the normal pace-maker? These can be answered with accuracy only after a study of general anaesthetics on a heart in which nodal rhythm has been produced experimentally (Arora, R. B., Meilman, E. and Kraye, O., 1952) when it will be devoid of all extra cardiac and S. A. nodal influences.

In addition, it would be good to know something about the blood concentration also as it is our purpose to apply the knowledge gained from these quantitative pharmacological studies on general anaesthetics, to clinical anaesthesia. Needless to say the safest and most efficient administration of anaesthesia depends upon a quantitative knowledge of the behaviour of a given anaesthetic agent. Such precise information may be obtained in the operation theatre. Investigation along these lines might explain unexplained cardiac arrhythmias during general anaesthesia and give us a clear conception of the action of general anaesthetic agents on cardiac automaticity.

Liliaceous plants all over the world are known to contain pharmacologically active principles. We are very familiar today with the veratrum alkaloids belonging to the sub-order Melanthaceae; investigations of which on modern scientific levels have clarified some of our basic concepts of physiology and pharmacology. To my knowledge Indian liliaceous plants have not been systematically studied, and it is very likely that we may find in them alkaloids of

various kinds with diverse pharmacological properties and it is very probable that some of these drugs have therapeutic potentialities. With the present day advances in chemistry it is possible to isolate the active principles in pure form. So far, research along these lines has been in the background due to the lack of trained pharmacologists in India. Also, adequate facilities for research have not been available except in a very few laboratories like that of Sir Ramnath Chopra.

Chemical pharmacology.—As chemistry is employed to probe into physiological processes and products, it becomes necessary to strengthen the background of basic information before practical results can be achieved. In this way, medical chemistry contributes both to fundamental problems and to the ultimate goal of producing more useful therapeutic agents. Some of the most important researches in hormones may not bear fruit for some time, to the extent of becoming available for production on a plant scale. Eventually however, the synthesis of cortisone, for example, may become a very important factor in the pharmaceutical industry. Announced almost simultaneously by several groups in this country, England and Mexico, the new methods which represent brilliant accomplishments in organic synthesis of the polypeptides and which were announced during the year will not probably be employed commercially in the immediate future. Ultimately, they too may prove to be of value in the synthesis of ACTH and other pituitary hormones. Early in the year, the synthesis of compound F, 17-hydroxycorticosterone, from cortisone was described.

Preliminary studies of the posterior pituitary hormones, oxytocin and vasopressin, indicated the possibility that they may be octapeptides of similar constitution. The former was reported to be composed of the following amino-acids: leucine, isoleucine, tyrosine, proline and isoleucine replaced by arginine and phenylalanine. An announcement of the order in which the 30 amino-acids comprise the B chain of insulin represented another landmark in the progress of polypeptide chemistry. Investigation on ACTH centred round the obtaining of purer preparations. The use of oxycellulose as an absorbing agent provided a very useful procedure for the concentration of the active principle.

Synthetic analogues of desoxycorticosterone acetate were described which slowed up to one third of the activity of the natural material in experimental animals. Of the various substances tested, 5-phenylindan-1-hydroxymethyl-ketone was among the most active.

In the vitamin field, a synthetic substance 5-formyl-5, 6, 7, 8-tetrahydropteroylglutamic acid, leucovorin or folic acid SF, with activity similar to the citrovorum factor was synthesized independently by two groups. It appears to be very similar to, but probably not identical with, the natural product. This substance represents a further step in the metabolism of folic acid and appears to be

involved in a single carbon atom requirement for the biosynthesis of purines and the methyl groups of choline, methionine, and thymine.

Further studies of the B₁₂ group led to the introduction of a combination of these agents with an extract of hog gastric mucosa for the oral treatment of pernicious anaemia. Progress on the structural studies of the complex cyano cobalamin, B₁₂, molecule has been slow, although the preparation of a number of coordination complexes with various ions replacing the cyanide ion was reported.

One of the *Lactobacillus bulgaricus* factors was identified by degradation and synthesis as N-(pantothenyl)-B-aminoethanethiol or the corresponding disulphide. The same moiety was also reported to be a part of the coenzyme. A molecule, together with adenosine and three molecules of phosphoric acid, one of which is present as a monophosphate ester. An interesting feature of the structural studies on this coenzyme was the extensive use of the enzyme in its degradation. α -Lipoic acid was isolated from liver in crystalline form. In catalytic amounts, it replaces acetate for *Streptococcus lactis* and it is required for oxidative decarboxylation of pyruvic acid by *Streptococcus faecalis*.

The use of enzymes for the debridement of wounds and localized infections received considerable attention during the past year. A combination of streptokinase and streptodornase was employed successfully. The latter may be a mixture of enzymes with hydrolysed nucleo-proteins, while the former is thought to stimulate a fibrinolytic factor in the blood serum. The enzymes appear to act only on dead tissues.

Interest in heparin was increased by the announcement of its possible value in acute rheumatic fever and atherosclerosis. Studies in Korea demonstrated its value also in the treatment of frostbite. A synthetic polysulphuric ester of polygalacturonic acid—methyl ester methyl glycoside sodium salt was reported to possess about one third of the anticoagulant activity and to be less toxic than heparin.

Summary.—The trends in pharmacological research during the last fifty years, have been reviewed. Modern developments in pharmacology have followed two main directions: (1) the investigation of mechanisms by which drugs produce their actions, and (2) the discovery of many drugs of therapeutic importance. Some of the more important concepts have been described in this article as these will largely influence future research. Researches relating to the measurement of subjective response, are also presented with stress on clinical pharmacology. The use of radioactive isotopes in medicine has also been described. Amongst the anti-accelerator cardiac agents the recognition of veratrum alkaloids closes an important gap in the general scheme of the pharmacology of the autonomic system. A case is presented for research into the Indian liliaceous plants which should be explored to isolate and study such alkaloids as are likely to exert selective blocking action on the cardiac accelerator mechanism of mammalian heart.

References:

1. Arora, R. B., Meilman, E. and Krayner, O., (1952)—Federation Proceedings, Vol. II, No. 1, March.
2. Arora, R. B., (1953)—Journ. Pharm. and Expt. Therap., 108: 1, May.
3. Arora, R. B., Krayner, O. (1952)—Journ. Pharm. and Expt. Therap., 106: 371.

References—(Contd.)

4. Avery, O. T., MacLeod, C. M., and McCarty, M., (1947)—*Jour. Biol. Chem.*, 169: 515.
5. Bancroft, and Richter, (1931)—*J. Physical Chem.*, 214.
6. Barron, E. S. G., Nelson, L. and Ardao, M. I., (1948)—*Jour. Gen. Physiol.*, 32: 179.
7. Beecher, H. K., (1946)—*Ann. Surg.*, 123: 96.
8. Beecher, H. K., (1952)—*Science*, Aug. 15, 116: 3007, pp. 157-162.
9. Beecher, H. K., et al., (1951)—*U. S. Med. Bull.*, 2: 1269.
10. Beecher, H. K. (1943)—*Ann. Surg.*, 117: 825.
11. Beecher, H. K. (1949)—*In the Hospital in Contemporary Life*, Cambridge, Harvard Univ. Press, 70-107.
12. Clarke, (1933)—*Action of Drugs on Cells*, p. 47.
13. Clarke, A. J., (1933)—*Mode of Action of Drugs on Cells*, London Arnold, p. 18.
14. Cohen, E. N. and Beecher, H. K., (1951)—*J.A.M.A.*, 147: 1664.
15. Cooper, P. D., Rowley, D. and Dawson, I. M., (1949)—*Nature*, 164: 842, Nov. 12.
16. Crum Brown and Fraser, (1869)—*Proc. Royl. Soc., Edinburgh* 560.
17. Ellinger, P. and Lambrechts, A., (1937)—*Jour. Physiol.*, 89: 30 P and 33 P.
18. Denton, J. E., and Beecher, H. K., (1949)—*J.A.M.A.*, 141: 1051.
19. *Ibid.*—1146.
20. *Ibid.*—1148.
21. Franklin, A. L., Li, C. H., and Dunn M.S., (1947)—*J. Biol. Chem.*, 169: 515.
22. Gale, E. F. (1947)—*Nature*, 160: 407, Sept. 20.
23. Gale, E. G., and Taylor, E. S., (1947)—*Jour. Gen. Microbiol.*, 1: 314, Sept.
24. Gaddum, (1942)—*Edin. Med. J.*, 49: 721.
25. Haeghe, L., Dean, R. B., Noonan, T. R., and Fenn, W. O., (1941)—*Jour. Gen. Physiol.*, 24: 353, Jan.
26. Handbuch, (1937)—*Exper. Pharmacologie*, Ban IV, A. J. Clark, p. 200.
27. *Ibid* (1937)—p. 205.
28. Hickman, K., (1949)—*Am. N. Y. Acad. Sc.*, 52: 200, Oct. 31.
29. Harry, Gold, M.D., (1952)—*Am. J. Med.*, 12: 6., 619-20.
30. Wills, J. H., (1950)—*The Scientific Monthly*, 71: 2, Aug.
31. Keats, A. S. and Beecher, H. K. J., (1950)—*Pharmacol. Exp. Therap.*, 100.
32. Keats, A. S., D'Alessandro, G. L., and Beecher, H. K., (1951)—*J. A. M. A.*, 147: 1761.
33. Krayner, O., (1949)—*Pharm. Exp. Therap.*, 96: 492.
34. *Ibid.* (1949)—*J. Pharmacol. and Exper. Therap.*, 97: 246.
35. Krayner, O., and Reiter, M., (1950)—*Arch. Internat. de Pharmacodyn. et de therap.*, 87: 409.
36. Krayner, O., and Acheson, G. H., (1946)—*Physiol. Rev.*, 26: 383.
37. Krayner, O., and Van Maanen, E. F., (1949)—*J. Pharm. Exp. Therap.*, 97: 301.
38. Krayner, O., (1950)—*J. Pharm. Exp. Therap.*, 98: 427.
39. Krayner O., Mandoki, J. J. and Mendez, C., (1951)—*J. Pharm. Exp. Therap.*, 103: 412.
40. Krayner, O., and Uhle, F. C., and Ourisson, P., (1951)—*J. Pharm. Exp. Therap.*, 102: 261.
41. Krayner, O., and Briggs, L. H., (1950)—*Brit. J. Pharm.*, 5: 118, 517.
42. Krayner, O., (1950)—*Arch. Exper. Path. U. Pharm.*, 209: 405.
43. Krayner, O., (1950)—*J. Pharm. Exp. Therap.*, 100: 146.
44. Krayner O., and Ourisson, P.—*Unpublished observations*.
45. Krantz, (1940)—*Arch. Int. Pharmacodynamie et de Therapie*, 64: 115.
46. Marsh, D. R., Herring, D. A. and Howard, A., (1951)—*J. Pharm. Exp. Therap.*, 103: 172.
47. Overton, (1901)—*Studien über die Narkose*, Jena.
48. Otto Loewi, (1951)—*Personal communication*.
49. Otto Loewi, (1950)—*Symposium Sterling Wintrop Research Institute*, May 17.
50. Pappenheimer, A. M., Jr. (1947)—*Federation Proc.*, 6: 479, June.
51. Price, W. H., Cori, C. F., and Colowick, S. P., (1946)—*Jour. Biol. Chem.*, 160: 633, Oct. (Colowick, S. P., Cori, G. T., and Slein, N. W., (1947)—*Jour. Biol. Chem.*, 168: 583, May.
52. Sdycoof, R. N., (1949)—*Ann. N. Y. Acad. Sc.*, 50: 419, Jan. 27.
53. Shapiro, B., (1947)—*Biochem. Jour.*, 41: 151, No. 2.
54. Stadie, W. C., Haugaard, N., Marsh, J. B., and Hills, A. G., (1949)—*Am. Jour. Med. Sc.*, 218: 265, Sept.
55. Stadie, W. C., Haugaard, N., Hills, A. G., and Marsh, J. B., (1949)—*Am. Jour. Med. Sc.*, 218: 275, Sept.
56. Stern, J. R., Eggleston, I. V., Hems, R. and Krebs, H. A., (1949)—*Biochem. Jour.*, 44: 410, No. 4.
57. Straub, (1907)—*Pflüger's Arch.*, 119: 127.
58. Thron, C. W., et al., (1949)—*New Engl. Jour. Med.*, 241: 529, Oct. 6.
59. Uhle, F. C., (1951)—*Am. Chem. Soc.*, 73: 883.
60. Verzar, G., (1935)—*Biochem. Ztschr.*, 276: 17, Douboffer, S., (1935)—*Arch. f. Exper. Path. u. Pharm.*, 177: 689.
61. Voegtlin, C., Rosenthal S. M., and Johnson, J. M., (1931)—*Public Health Rep.*, 46: 339, Feb. 13. Rosenthal, S. M., (1932)—*Public Health Rep.*, 47: 241, Jan. 29.
62. Wilbrandt, W., (1940)—*Arch. f. d. ges., Physiol.*, 243: 519.

ABDOMINAL TUBERCULOSIS *

MAJOR V. K. CHARI, M.B., B.S., T.D.D.,
Member of the American Academy of Tuberculosis Physicians,
Tuberculosis Department, Erskine Hospital, Mathurai

ABDOMINAL tuberculosis includes tuberculous peritonitis and tuberculous enterocolitis.

Tuberculous peritonitis.—It occurs at any age but more commonly between the ages of 20 and 40 and the incidence appears to be greater in women than in men, as seen in daily practice

It is doubtful whether there is primary tuberculosis of the peritoneum. It is nearly always secondary to tuberculous lesions elsewhere and is usually due to direct extension from a local lesion, caseating retroperitoneal lymph gland, tuberculous enterocolitis or tuberculous salpingitis. Occasionally, it may be the result of hæmatogenous infection as a part of generalised miliary tuberculosis. Rarely, it may be due to lymphogenous spread from the lungs and pleura through the diaphragm.

There are two main types of tuberculous peritonitis, namely the (1) exudative and (2) the non-exudative.

I. Exudative type.—This is otherwise called the ascitic type, and its onset may be acute or insidious.

The acute form may be part of a generalised miliary tuberculosis, possibly from a focus in the bronchus or lung. It may be associated with a considerable amount of effusion collecting in a short period of three days! The acute ascitic form may be characterised by sudden abdominal pain, vomiting and sometimes tenderness in the abdomen. Temperature may be of the high swinging type or continuous. In this acute form,—the ascitic type—the diagnosis is seldom made before exploration. The points in favour of the diagnosis are: (a) the absence of rigidity, (b) the presence of fluid in the abdomen, (c) associated tuberculous lesion elsewhere in the body and (d) exploratory puncture—The fluid is of the exudative type with a sp. gr. of 1016 or more and an albumin content of 3% or over. Lymphocytes may preponderate. Though it is difficult to detect tubercle bacilli in the exudate by microscopic examination, the culture and guinea pig inoculation are positive.

The chronic ascitic form with an insidious onset is a mild variety and is more common than the acute form. The toxæmic symptoms are often slight. There may be a mild evening rise of temperature. The patient loses weight and his appetite is often poor. Abdominal pain and tenderness are not well-marked. Constipation is a common symptom. Diarrhoea, if present, is an indication of intestinal involvement. The fluid takes time to collect and the abdomen slowly

* Specially contributed to the ANTISEPTIC,

increases in size and gets distended in course of time. The skin is often pigmented, stretched and shiny and the superficial veins are often enlarged. If the accumulation of fluid is large enough, it may compress the inferior vena cava and give rise to oedema of the legs. The chief feature of this type is the marked contrast between the distended abdomen and the emaciated body and the limbs. The abdomen may have a doughy feeling. The diagnosis is not so difficult as in the acute variety. Besides cirrhosis of the liver, in elderly people one has to keep in mind the possibility of malignancy. In addition to the points that are in favour of tuberculosis, an exploratory puncture often confirms the diagnosis.

Non-exudative or plastic type.—This variety may start as a dry type from the beginning or it may be a later development of the ascitic type after the fluid gets absorbed. In this variety there is little or no fluid but a dense plastic exudate is present which glues the coils of the intestine together, giving rise to adhesions as a result of which there may sometimes be a certain amount of chronic obstruction. Sometimes there may be a localised amount of chronic abscess may form, burst and give rise to a fistula-formation between the adherent loops of intestines or between the loop and the peritoneal pocket and this fistula may open at the umbilicus.

In this variety, the onset is insidious with gradual malaise, weakness and loss of weight. The temperature is variable, and may be of a low grade or a hectic type. Flatulence is a troublesome symptom. Diarrhoea may be present if there is intestinal ulceration. The stools may be offensive and bulky owing to deficient absorption of fat due to obstruction of the lacteals by caseous mesenteric glands. Pain and discomfort may be a marked feature. The pain may be colicky in nature. Sometimes there may be symptoms of partial intestinal obstruction.

The abdomen is moderately distended, and has a rubbery or doughy feel; and on deep palpation irregular masses or a transverse mass may be felt in it. There may be signs of inflammation around the umbilicus. The skin over the abdomen is dry and inelastic. The spleen and liver may be enlarged. It may sometimes be confused with malignancy in elderly people and rarely it may be mistaken for an ovarian cyst in women, if it happens to be an encysted form. The points in favour of tuberculosis are:—(a) associated tuberculous lesion elsewhere; (b) doughy feeling of the abdomen; (c) inflammation around the umbilicus, if present; (d) Mantoux test is strongly positive; (e) an X-ray of the abdomen may show calcified glands; and (f) the chronicity with a low grade or hectic type of temperature.

Prognosis:—The exudative type offers a better prognosis than the plastic type. Suppuration and fistula-formation make the prognosis worse.

TREATMENT:—The patient should be kept in bed in a well-ventilated room with an abundant supply of fresh air till the temperature completely settles down.

Diet:—A high-protein diet rich in vitamins with a low residue should be given. When there is fatty diarrhoea, avoid fats.

Medical:—The general condition of the patient should be improved; 10 cc. of 10% gluconate solution with vitamin C twice a week may do him some good. The lung condition when present should be treated by appropriate measures. Chemotherapy has changed the outlook and has helped in the majority of cases to arrest the progress of the disease. Streptomycin in combination with isoniazid seems to give better results than streptomycin with PAS. Various dosages have been recommended. I give 1 g. streptomycin intramuscularly every day in a single dose for 20 days; then 1 g. on alternate days for another 20 days. Isoniazid, 150 to 200 mg. a day, is continued throughout the course of streptomycin. After completing the course of streptomycin, I usually put the patient on 12 g. of PAS a day with 200 mg of isoniazid for a period of 2 to 3 months. The results have been quite satisfactory in the exudative and in the uncomplicated plastic types.

(U.V.) X-ray:—In the absence of a lung lesion, U.V. ray exposure may do good. Starting with a 2-minute exposure the treatment is gradually increased by one minute every day till an exposure time of 10 minutes is reached which is continued for a period of 20 days (at 10 minutes a day).

Surgical:—Surgery is not the method of choice. Paracentesis is a dangerous procedure, as there is a risk of puncturing the adherent gut. Laparotomy is of doubtful value. Formerly, exposure of the diseased peritoneum to the air was supposed to be beneficial but it is now considered doubtful. Occasionally improvement may result after laparotomy which may be due to the stimulation of antibodies and the promotion of hyperaemia. Surgery is indicated only, when there is intestinal obstruction. The mortality following such operation is usually high. It is rarely possible to do anything useful, owing to the extensive adhesions that may be present.

Tuberculous enterocolitis.—May be of the ulcerative or the hyperplastic types.

ULCERATIVE TYPE:—Ulcerative tuberculous enterocolitis is fairly common as a complication of far advanced or moderately advanced cases of pulmonary tuberculosis. A mild degree of tuberculous lesions probably exists in the vast majority of patients suffering from pulmonary tuberculosis and it is likely that spontaneous recovery commonly occurs in such minor lesions; hence these cases do not come to light.

The source of infection in almost all cases is the bacilli-laden putum which may be swallowed by a phthisical patient. When the

bacilli reach the intestines, they do not, necessarily give rise to lesions. Very often they do not so long as the intestinal mucosa is healthy. Usually the tendency is for the bacilli to be expelled. Even after penetrating into the submucous layer, the organisms may get destroyed by the phagocytes. But if the mucous membrane of the intestine is not healthy, if the resistance of the individual is low and if there is repeated and massive infection from the swallowed sputum, the organisms succeed in multiplying and producing tuberculous lesions in the gut.

The lower end of the ileum and the cæcum are the parts most frequently affected and from this site the disease spreads up and down. The reasons for this area of predilection are twofold: there is excessive lymphoid tissue in the lower part of the ileum and the contact of the contaminated residue with the mucous membrane is prolonged as the rapid passage of the contents gets slowed down at the ileo-caecal junction.

The earlier lesions are in the lymphoid tissue. They usually originate in the Peyer's patches and solitary lymph follicles and spread along the lymphatics encircling the gut. There is round-cell infiltration followed by necrosis and caseation. The caseated mass may be shed off leaving an ulcer. The ulcers may be superficial or deep. The superficial ulcers heal and the mucous membrane apparently regenerates whereas the deep ulcers which heal are replaced by fibrous tissue which may give rise to multiple strictures. If the destruction of tissue is extensive, cicatrization is great and if the ulcer is of the girdle type, stenosis results. These lesions may reach the peritoneal coat and give rise to adhesions with various loops of the intestines. A certain amount of peritonitis may sometimes occur.

The initial symptoms are indefinite. The patient is usually thin and emaciated, with loss of appetite and dyspepsia. A short attack of diarrhoea may be followed by constipation. After some time, the attacks of diarrhoea become frequent and obstinate. There may be abdominal pain, which has no relation to food but may be aggravated by food. The pain may sometimes be colicky in nature. There is no tenderness. Bleeding is very uncommon because of the arterio-sclerotic changes. Similarly perforation of the ulcers is rare owing to adhesions among the coils of the intestines. Later on with stricture formation there is a tendency to chronic obstruction; as a result of the extensive adhesions and bands, acute obstruction may also be caused. The temperature is usually of the high swinging type.

DIAGNOSIS:—Laboratory tests are of little value in diagnosis, because the discovery of the tubercle bacilli in the faeces in the presence of a lung lesion does not necessarily indicate ulceration of the intestine. But when there are symptoms referable to the alimentary tract, the presence of pulmonary lesion is presumptive

evidence of the intestinal lesion being tuberculous. Radiological investigation sometimes enables an early diagnosis to be made. X-ray examination after a barium meal may show a rapid emptying of the affected portion of the gut with a characteristic spastic filling defect. The conditions to be considered in the differential diagnosis are mucous colitis, amœbic dysentery, non-tuberculous enterocolitis and chronic appendicitis.

PROGNOSIS:—If recognised early and treated properly, intestinal tuberculosis heals in the majority of cases. If signs of obstruction are present, the prognosis is bad.

TREATMENT:—Absolute rest in bed is essential for the ulcers to heal up. The diet must be a high caloric and high vitamin diet without over-feeding. It must be easily digestible and one which leaves little residue. Excess of milk should be avoided.

Medical:—Appropriate symptomatic treatment for diarrhoea etc., should be given. Calcium gluconate (10 % solution) 10 cc. with vitamin C once every three days, may help to relieve the pain. Vitamin C appears to increase the healing power. Chemotherapy is extremely useful in these cases. A combination of streptomycin with isoniazid is to be preferred. The primary lung lesion must be treated by appropriate measures so as to make the sputum negative.

Collapse therapy:—Should be used in suitable cases. Pneumoperitoneum is sometimes useful in relieving abdominal pain and may exert a favourable influence upon the lung lesion.

Surgical:—Surgery is not indicated except for dealing with obstruction consequent upon cicatrization. But if the pulmonary lesion is far advanced, the patient may not be able to stand the operation.

HYPERPLASTIC TYPE:—It is relatively infrequent, and is not usually associated with a pulmonary lesion; it often seems to be primary, and is more common in females than in males, particularly in adults between the ages of 20 and 40. The disease generally starts in the cæcum and often remains confined to that part of the bowel but it may extend proximally towards the ileum and distally towards the colon. Occasionally the disease may start in the sigmoid colon.

When the bacilli enter the submucous layer, they produce proliferative lesions. There is more of fibrous tissue formation. All the coats are involved. The mucous membrane becomes hypertrophied and thrown into polypoidal folds which project into the lumen causing a marked narrowing of the lumen. The submucosa and the muscular coats are hypertrophied, fibro-fatty deposits are increased and the walls of the affected portion of the gut become greatly thickened and hardened. Caseation is usually absent. The neighbouring lymph glands are enlarged.

The symptoms are mainly those of chronic obstruction due to narrowing of the lumen of the gut. There may be vague pain in

the right iliac fossa. Diarrhoea may alternate with constipation. An intermittent type of temperature is usually present and the patient is thin and emaciated. A palpable tumour makes its appearance in the caecal region and it can be rolled in the early stages but gets fixed in the advanced stages. There may be a certain amount of tenderness. A gurgling sound may be elicited on palpation.

Clinical diagnosis of ileo caecal tuberculosis is difficult on account of its close resemblance to cancer. Chronicity of symptoms often with long periods of intermission may help to suggest the diagnosis. X-ray shows a filling defect.

TREATMENT:—It is a definite indication for surgery. The earlier it is done the better the result. Radical resection is to be preferred.

References :

- | | |
|--|---|
| 1. Boyd, (1913)—Text Book of Pathology, 4th Ed. | 4. Hingworth, (1917)—Text Book of Surgical Pathology, 5th Ed. |
| 2. Goldberg, (1917)—Clinical Tuberculosis, 5th Ed. | 5. Kayne <i>et al.</i> , (1918)—Pulmonary Tuberculosis, 2nd Ed. |
| 3. Heat, (1918)—Recent Advances in Respiratory Tuberculosis, 4th Ed. | 6. Price, (1956)—Text Book of the Practice of Medicine, 8th Ed. |

MANAGEMENT OF EXTRA-SYSTOLES

Extra-systoles or premature beats are the commonest and least important of the cardiac arrhythmias. Nevertheless they are the commonest cause of cardiac neurosis and may occur in four general situations:—

(1) When the patient is on digitalis therapy—the appearance of premature beats suggests the possibility of digitalis overdose. (2) Following myocardial infarction—the appearance of frequent extra-systoles demands prophylactic quinidine or pronestyl therapy to prevent other more important or even serious arrhythmias. (3) In other types of heart disease and in the absence of digitalis therapy, premature beats are of little importance although they may cause anxiety to the patient. (4) In the absence of organic heart-disease, premature beats are frequently the reason a patient seeks medical advice. The diagnosis that premature beats are the cause of the patient's symptoms may be very easy or very difficult. The symptom may be described by the patient in the following terms—"my heart goes up in my throat." This sensation may be followed by jumping up in bed, hyperventilation which may be readily confused with cardiac asthma, tachycardia and a state of near panic. The diagnosis is therefore, important and often must be made on the history alone.

Premature beats may be handled along the following lines: (a) Exclude organic heart disease; (b) reassure the patient—this may have to be repeated frequently and forcefully; (c) eliminate if possible any psychogenic precipitating factors—or explain their relation to the occurrence of extra systoles. Remember that the commonest cause of systoles is tension; (d) stop tea, coffee, tobacco and alcohol; (e) mild sedation; (f) specific drug therapy is 250 to 500 mg. *b.i.d.* to *q.i.d.*, in the case of ventricular extra-systoles. If these fail, digitalis may be beneficial.

Finally, do not tell patients of premature beats if they are not aware of them—iatrogenic heart "disease" is hard to cure.—(*Bull. Vanc. Med. Assoc.*, December 1954).

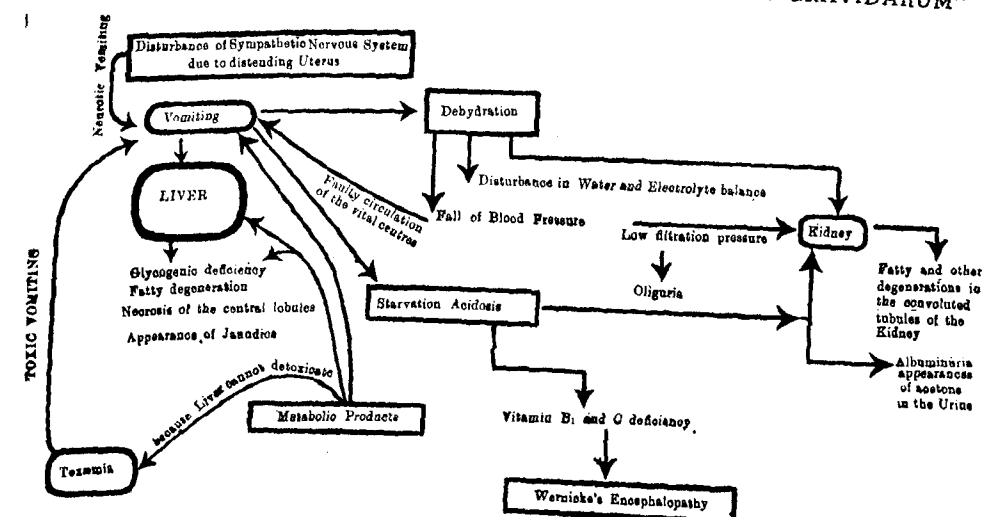
HYPEREMESIS GRAVIDARUM AND ITS MANAGEMENT*

ARUN KUMAR BAGCHI, B.Sc., M.B., B.S., D.G.O.,
Registrar, Obstetrical and Gynaecological Department,
Chittaranjan Hospital, Calcutta National Medical College, Calcutta

Varieties.—It was customary to describe two varieties:—(a) neurotic and (b) toxæmic. But it is now believed that elements of both neurosis and toxæmia are present in every case and the variety is named according to the predominant element.

Pathogenesis.—The most plausible sequence is as follows:—
(1) The mischief starts possibly as an irritation of the sympathetic nervous system caused by the distending uterus, as a result of which vomiting begins; (2) the vomiting causes a deficiency of the glycogenic function of the liver which leads to fatty degeneration. According to Sheehan, fatty changes may affect the whole lobule or be confined to the area in the centre of a lobule of the liver; (3) a toxæmia, is thus set up because the liver cannot now detoxicate metabolic products as it should normally do; (4) the toxæmia is aggravated by (a) dehydration and (b) starvation acidosis; and (5) vitamin B₁ deficiency may cause Wernicke's encephalopathy.

SCHEMATIC DESCRIPTION OF CHANGES IN "HYPEREMESIS GRAVIDARUM"



Three stages may be distinguished:—(1) the wasting stage, characterised by increased vomiting, later on, coffee-ground vomits, scanty urine and appearance of albumin and a rapid pulse:—(2) the pyrexial stage characterised by fever, jaundice and eye disturbances and (3) the stage of coma.

Management.—I. The treatment should be based on the sequence of events already indicated as the working hypotheses.

II. The essential points in treatment are to combat:—(1) the neurotic element by (a) isolation; (b) suggestion; and (c) administration of bromides; (2) the glycogenic deficiency of the liver by administering glucose; (3) dehydration by the liberal administration of fluids; (4) acidosis by giving glucose and sod. bicarb; (5) degeneration of the liver by administering glucose and calcium gluconate; and (6) Wernicke's encephalopathy by the administration of Vitamin B.

III. The details of treatment for moderately severe cases consist of:—(i) complete rest in bed, physical and mental and isolation from relatives; (ii) withdrawing all oral feeds (food and medicine) except ice-cracks, when necessary; (iii) rectal administration of 4 to 5 pints of 5% glucose in normal saline every day; or in emergencies intravenous 5% glucose saline by the drip method; (iv) bromides (40 gr.) given with the evening rectal saline; (v) Vitamin B (aneurin hydrochlor) 50 mg. every day injected subcutaneously; (vi) 5 cc. of a 10% solution of calcium gluconate injected every other day; and (vii) in very severe cases, cortin to be injected in order to raise the blood-pressure. (It is however, doubtful whether this has any specific effect on the hyperemesis).

IV. Points to observe and record.—Daily observations should be made and recorded of (a) the total fluid-intake; (b) the total fluid-output; (c) the number and quantity of vomits; (d) the results of examination of urine for acetone, bile and albumin; (e) the pulse, temperature and blood-pressure; and (f) any eye disturbances, by ophthalmoscopic examinations from time to time.

V. Favourable signs include (1) cessation of vomiting; (2) increased output of urine with a low specific gravity; (3) a clean moist tongue; (4) a slow but regular pulse of good volume; (5) normal temperature and blood pressure; (6) absence of bile and albumin in the urine; (7) absence of jaundice; and (8) absence of any dimness of vision.

VI. The indications for termination of pregnancy are:—(a) failure to show improvement under medical treatment in the course of a week or so; (b) the occurrence of jaundice, or bile in the urine; (c) the persistence of albumin in the urine; (d) a persistent pulse-rate of over 100, per minute; (e) a persistent temperature of over 100°F.; (f) a persistently low blood-pressure; and (g) optic neuritis, retinal hæmorrhage, dimness of vision, nystagmus, squint, nasal regurgitation of fluids, hoarseness of voice (symptoms of Wernicke's encephalopathy).

SOME ASPECTS OF IMPOTENCE IN THE MALE*

B. KRISHNA RAO, M.B., B.S. (Post-graduate in Sexology of the Karlov University, Prague),
New Delhi

Introduction.—Impotence in the male is far more common than is generally believed. The general practitioner meets with a fair number of patients who complain of "weakness" by which the patient wants to convey that he has some sexual problem. 'Impotence' is the commonest complaint for which advice is usually sought. In a series of 140 persons, who sought advice from me for sexual problems, 100 were for 'impotence,' as shown by a total lack of erection, partial erection, and premature ejaculation.

Definition.—Potency or *Potentia Coeundi* is defined as "the ability to perform the physio-psychic act known as coitus (Levie). Conditions unfavourable to the act of coitus would cause disturbances in potency, either quantitative or qualitative. The term impotence, however, indicates that the physiological act cannot or can only partially be performed due to incomplete erection or total lack of erection or due to premature ejaculation. Impotence, therefore, may be defined as the "inability to perform the act of coition due to a partial or total failure of erection."

Premature ejaculation is also considered here due to its close association with the problem of impotence. Premature ejaculation is really impotence in its mildest form while total lack of erection is the severest form of impotence. Very commonly *ejaculatio-præcox* is the precursor of impotence and is often accompanied by weak erections.

A full and sustained erection of the penis is the first requisite for successful coitus. If erection fails at the moment of intromission, or if it is not sufficiently powerful, intercourse will not be possible, even though libido, orgasm and ejaculation are normal.

In cases of impotence, the first question to tackle is whether it is organic or psychic in origin. Sexologists are generally agreed that most cases of impotence are psychologically determined. Levie found that only 9 out of 1200 cases were due to organic causes. Pillay in his report on 300 cases found 271 to be of psychic origin while 19 showed signs of hypogonadism and 10 were caused by organic defects. In my own series of 100 cases, not one was due to any organic trouble. Levie estimates that 99% of cases are psychogenic in origin. I am inclined to agree with Pillay that the term "psychogenic" should be broadly interpreted so as to include factors such as ignorance of biological facts, feelings of inadequacy, lack of experience etc.

Organic and hormonal causes should first be eliminated by thorough physical, neurological and anthropometric investigations.

* Specially contributed to the Golden Jubilee Issue of the ANTISEPTIC

I would like to stress the importance of careful history taking as far as possible in the patient's own words. It often happens that a patient believes he is impotent while he is really not. A patient came to me with the complaint of premature ejaculation. His premarital and post-marital coital time was, according to him, 10 to 15 minutes. Now it was only 6 to 8 minutes which he felt was too short! The above case clearly illustrates that the patient was woefully ignorant of cardinal biological principles and was labouring under a serious misconception about premature ejaculation.

The mechanism of erection and ejaculation are under the dual control of the brain and the spinal cord—the higher and lower sexual centres. A thorough physical examination will alone reveal the anatomical integrity of the entire nervous system. It may be emphasised here that in organic lesions impotence is absolute, while in impotence of psychic origin the failure of erection occurs only on certain occasions; in such cases it can be elicited that the patient does experience erections at certain times, e.g., in the mornings or while reading erotic literature or when in contact with an attractive partner. Even in cases where, at the time of examination, he does not experience *even* morning-erections it can always be elicited that at some earlier stage, the patient had experienced erections, perhaps only short and feeble. But it must be remembered that erection in the adult male is a specific response to a specific stimulus erotic in nature, and subject to psychic influence, both favourable and unfavourable. Factors such as disgust, fear, or impotence, lack of confidence, moral restraints, feelings of inferiority, ignorance of biological facts and lack of knowledge of the technique of the art of love are amongst the commonest causes of impotence. I should mention separately an ætiological factor which is by far the commonest—the culturally conditioned masturbation-complex. I do not propose to consider in this article the deeper psychological causes which are genetic in origin and require deep psychotherapy.

"Basically speaking every person is only relatively potent and thus at the same time also relatively impotent; for an absolute potency towards all persons, whether male or female, young or old, does not exist. It more often happens that the more the potency is limited, the more highly differentiated are the person and his love" (Hirschfeld). Thus the love requirements of the sophisticated persons are far too exacting and it is little wonder that impotence is so common amongst the intellectuals.

Impotence is not therefore, a disease *per se* but only the sign of a disorder and must therefore, vary widely with individuals depending on the age, education, profession, whether married or single, and how long married.

Analysis of case histories.—Although the number of cases reviewed in this paper is small and not adequate to warrant definite

conclusions of value to be drawn, they present certain interesting features which deserve to be recorded. The 100 cases examined have been classified according to the age-groups noted below.

TABLE 1

Showing number of cases of impotence in relation to age

Age in years	Total No. of cases 100
Below 20	...
21 to 30	...
31 to 40	...
41 to 50	...
Above 50	...

Impotence appears therefore to be most common in the age group 21 to 30 which is the age period at which sexual vigour is expected to be at its maximum; thereafter there is usually a gradual decline.

CHART I

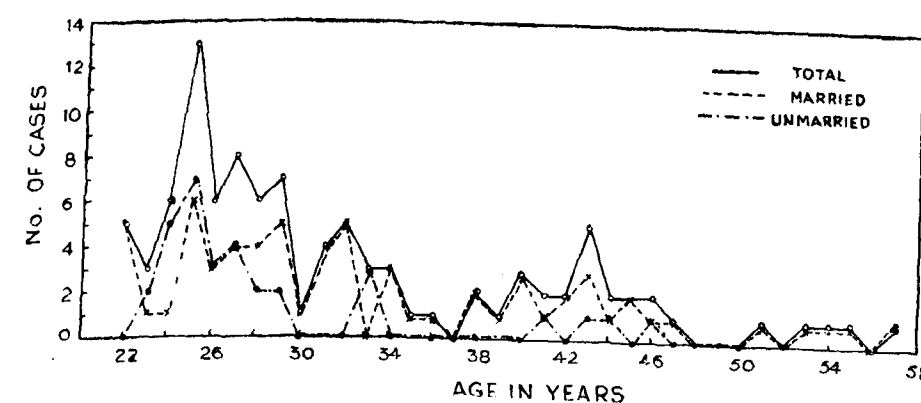


Chart I showing the detailed age incidence reveals certain interesting facts:—

The incidence of impotence occurs in three distinctly divided phases:—(i) young adults between 22 and 35 with the peak between 24 and 30 years; (ii) the middle-aged between 38 and 48 with the peak between 40 and 46 years; and (iii) the old people of over 50 years of age.

It is interesting to note that both in the married and in the unmarried in (i) and (ii) the same grouping holds good and there were no unmarried individuals in the third group.

In the first group the problem centred round inexperience, lack of proper knowledge of biological facts and the feeling of an inferiority resulting mostly in impotence and/or premature ejaculation.

In the second group the problem centred round blunting of the *libido sexualis* known also as satiety impotence (Pillay). The

female partner no longer elicits response with the same avidity or intensity.

Further, the patient's sexual libido is weakened by the individual's "will-to-power" and other ambitions in life about which Stekel observes: "Mercantilism which is an important form of 'will-to-power' through monetary acquisition, leaves scant room for love, for time is money and money then becomes more important than love." This group mostly has weak erections and/or premature ejaculation.

In the third group, those over 50 years, the main problem is one of fear of losing potency. Sexual vigour like acuity of any other faculty, will naturally suffer diminution with age, and fear of impotence dominates these individuals resulting in lack of erection or only weak erection.

Sixty-seven out of the 100 were married. Of these 28 complained of total lack of erection, failure of erection with or without ejaculation at attempting intromission; 31 complained of premature ejaculation and 18 of weak erections with or without ejaculation.

TABLE 2

Showing the number of cases of impotence in relation to duration of marriage		
Duration of marriage in years	Total number of cases	Failure of erection in
1. Less than 1 year ...	22	34
2. 1 to 5 years ...	13	
3. 6 to 10 " ...	9	
4. 11 to 15 " ...	5	
5. 16 to 20 " ...	7	
6. Above 20 " ...	11	
		7

The married group.—Failure of erection was highest in those who were married within one year. Of the 22 in this group 13 had no premarital experience; and 18 had premarital experience. 17 attributed their impotence to this practice. Only one patient professed to have had some knowledge of sex gathered from haphazard reading. The rest were either totally ignorant of all biological facts or had picked up notions from hearsay or from unauthentic information gathered from questionable pamphlets.

Of the 13 who had been married for 1 to 5 years, 7 had impotence or premature ejaculation before or since marriage. Of these 5 had no premarital experience. In the remaining 6 premature ejaculation set in, from 3 months to 2 years after marriage. In one case the patient got suspicious of the wife's premarital chastity resulting largely in premature ejaculation and at times total lack of erection. In the rest, fear of pregnancy, a feeling of guilt due to extramarital relations were the probable precipitating causes. 9 had been married for 5 to 10 years. Of these two had premature ejaculation

since marriage. One who had satisfactory coitus for 3 years then developed premature ejaculation which lasted for five years and finally landed in total impotence. 3 developed premature ejaculation and 3 became impotent after varying periods of potency.

Of the 12 who had been married for 10 to 20 years, only 2 had premature ejaculation on or before marriage and gradually their potency diminished. In the remainder impotence or weak erections set in, at different periods of married life. Two were due to fear of pregnancy. Three experienced impotence on attempting extramarital relations for the first time. One had premature ejaculation resulting from intercrural or vulval intercourse for three years as a method of contraception which gradually developed into total impotence.

Case reports.—CASE 1.—L., aged 38, married 18 years; wife 36; no children; complete lack of erection since 2 years; only son of his parents. Father had deserted the mother when the patient was a child who was brought up by the grandfather. He had education only up to the matriculation standard. He was masturbating from the age of 13 to 20 years and used to have heterosexual experiences with acquaintances and maid-servants. He was fully potent; and contracted gonorrhoea when he was about 17 years, complicated with orchitis and stricture. He married when he was 20; on the first night he had no erection at all, on the 2nd night ejaculation occurred without erection and on the 4th night erection with detumescence occurred on attempting intromission but on the second attempt the same night he had a satisfactory coitus. From then onwards he was quite potent with his wife having as many as 4 coitions, on some days. At the same time he became completely impotent extramaritally, detumescence occurring on attempting coitus. He attempted extramarital relations for 13 years without success and ultimately gave up "to keep up his dignity and not to be disgraced." A year later he had to live away from his wife for 2 years when he took to masturbation, ejaculating without erection. On his return he could not cohabit with his wife, due to total lack of erection. On taking some "medicine" he could cohabit for about three months with his wife *only* but soon relapsed into impotence. He has since been masturbating twice a week without erection. If he does not do so, he has 'night pollutions' three or four times a week, also without erection. Soon after "a discharge" he felt exhausted and 'blank' for about 2 days. This case needs no comment or elaboration and is very illuminating as regards the causes of impotence in that age group.

In the group married over 20 years, all were fairly potent at the outset but "weakness" set in gradually in the last few years. 7 had no or only weak erections while 4 developed premature ejaculation. All attributed it to advancing age and expressed fear of losing potency. One got erections while alone in bed or when reading erotic literature but was impotent on meeting the wife in bed.

The unmarried group.—Thirty-three out of the 100 cases comprising this study were from the unmarried. Of these 26 had heterosexual experience and 7 had none.

Those without any heterosexual experience felt themselves to be impotent. 5 of them had consultations before marriage, in order to assure themselves of their potency. The youngest was about 19 and the oldest 27. All of them believed that masturbation should

have impaired their potency. Two thought their sexual vigour was not adequate as they did not get erection on "excitement." Two did not experience erections while 'necking and petting'. One had feeble erection on masturbation and ejaculated quickly; the same person said that the erections were strong and it took longer to ejaculate when erection was 'spontaneous.' One thought his nocturnal emissions were a sign of his impotence. All were uniformly ignorant of biological facts and were emphatic on the "evil effects" of masturbation!

26 among the unmarried had had hetero-sexual experience. The youngest was 24 and the oldest 46. 18 were under 30 years and 4 above 40. Eighteen had masturbated at some time or other and 10 of them attributed their trouble to the "evil habit." 17 had premature ejaculation, 2 of whom ejaculated even on mere embrace. 6 had poor or no erections at all. 3 of these who were over 40 were resistant to treatment.

Two were under 30 years of age, and had severe traumatic experiences during adolescence requiring deep psychotherapy. 3 ejaculated prematurely on the first coitus but the second one which followed soon after at the same meeting was normal. 18 had no knowledge of biological facts while only 2 had done some healthy scientific reading. 13 had visited prostitutes; 9 had experiences with acquaintances; 10 attempted intercourse with friends or relatives. One of these with extreme premature ejaculation, got married subsequently and was able to have satisfactory coitus within a month and a half of treatment. The conditions for coitus were far from conducive in most cases. Fear of detection, fear of venereal disease, moral restraint, lack of privacy were all superimposed over the anxiety about potency and a desire to verify potency.

Discussion.—A study of the problem of impotence in the male which is fairly wide-spread should take into account the age and the marital status (married or not married and how long married) of the patient.

In this series, (see Table I) the largest number of cases (57%) occurred in the age-group of 21 to 30 years. Only 22% occurred in the next age-group of 31 to 40 and there was further decline in the subsequent age-groups. Sexual interests and desires are usually at their height between the ages of 21 and 30, but the opportunities for their expression and realization are limited being often subject to inhibitions and frustrations. Many young ones in this group lack experience and so approach sexual life with a certain amount of fear and ignorance. It is really a wonder that with all such inhibitions and frustrations, a considerably larger number do not suffer from impotence! This is perhaps due to the fact that human instinct scores very often over inhibitions.

As stated already, impotence is most common in the third decade of life, and there is a definite fluctuation corresponding to the three phases of life, *viz.*, of the young adult (21 to 35) of the middle aged (35 to 50) and of the older group (over 50). It is also interesting to note that in the first phase the condition is a little more pronounced in the unmarried than in the married, while in the second phase it is more marked in the married than in the unmarried.

Inexperience and fear of failure dominate sex-meetings and also as a result of great excitement premature ejaculation frequently results. A very large number of people, have premature ejaculation at the first attempt but many make a spontaneous recovery depending on the inhibitions. In this group, premature ejaculation is usually associated with strong erections and so they rapidly recover with re-assurance and re-education. A fair percentage either have only feeble erections in spite of strong libido and some have strong erections with detumescence with or without ejaculation on attempting coitus. These individuals require a closer study as they are often found to be subject to strong inhibitions or frustrations, requiring a psychotherapeutic approach, besides other remedial measures. The married respond better to treatment since the conditions for coitus are not restrictive, nor subject to inhibitions like moral restraint, fear of detection, and fear of venereal disease. Further they can have intercourse when the desire is strongest without waiting for opportunities.

In the second phase *viz.*, that of the middle-aged, the problem is more intense among the married persons. One of the commonest types of impotence met with is, what is known as 'satiety-impotence' (Pillay). The sexual partner who formerly induced quick erection, by mere contact is no longer able to stimulate him to the same extent. Extra-marital relations often prove satisfactory but in some, they actually cause impotence.

CASE 2.—E. A., aged 42, married 16 years, had no extra marital relations except "necking and petting"; marital potency was good; one day he was alone with a friend but could not get an erection despite several attempts; next day he consulted me and a simple explanation resulted in restoration of his vigour.

Attempt at extra-marital relations often gives rise to feelings of guilt resulting in lack of erection on meeting the wife next.

CASE 3.—K. B., aged 38, married 10 years, enjoyed fair marital coitus but was subject to premature ejaculations. One or two extra-marital relations early in marriage proved to be failures; he picked up an acquaintance during the long absence of his wife and at his first attempt he could have no erection at all but subsequently succeeded in having normal intercourse on several occasions; after the return of the wife the patient could not get erections at several attempts. Explanation together with small doses of testosterone helped him to regain his usual potency with the wife.

Another important cause for the lack of erection is the fear of pregnancy and the consequent indifference of the wife to sex

meetings. Often mutual masturbation, intercrural or vulval intercourse is resorted to, which no doubt relieve the sexual tension but are generally unsatisfactory and may gradually lead to impotence. Case No. 1, illustrates both impotence at attempting extra-marital relations and the effect of masturbation which was resorted to, during the absence of the wife.

Mention must also be made of the effect on potency of business preoccupations and worries, and ambitions of the middle-aged, which Stekel calls the "will-to-power."

CASE 4.—A.R., aged 38, married 6 years has 4 children, he had quite satisfactory sexual relations for four years; he had coitus 2 to 3 times a week. He became later involved in a heavy business loss and was also in difficulties during certain political upheavals; this caused a total loss of libido and sexual interest; he experienced even disgust, for over a year. Following improvement in his business affairs his sexual interest returned. He attempted to have intercourse at infrequent intervals since two months and had premature ejaculation but with good erections.

The case of the old (aged) is illustrated by the following case:

CASE 5.—L.B.N., aged 57, was married for 41 years; first when he was 16 and again when he was 35 years of age; he complained of premature ejaculation but the libido was good as also intercourse every 3 or 4 days until the age of 52. Now, although the desire is strong he has intercourse only once in one or two months so as "not to waste his health."

Although the libido is usually good, the thought of injury to health and fear of losing potency are very prominent. Senile changes cause a weakening of the perineal and other muscles which is reflected in weak erections. Total lack of erection is also seen prominently during this phase which is mainly due to a fear of the debilitating effect of coitus!

From the comments already made on the figures set out in Table 2 on page 362, it will be seen that those married less than a year form nearly a third of the total of 67 comprising the married group. Thirteen of the 22 had poor or no erection making intercourse impossible, whereas of the 34 married 1 to 20 years, only 8 had poor or no erections. Again in the 11 married for more than 20 years, 7 had poor or no erection.

The problems of the unmarried require special mention. Of the 33 in the unmarried group, 7 had no hetero-sexual experience but nevertheless thought they were impotent and came for advice. These often judge their potency on the absence of or on poor erections with erotic thoughts or during masturbation. Quite a few consider nocturnal erections as evidence of their impotence. There can be no doubt that this is entirely due to ignorance and to erroneous conceptions of sexuality. The unmarried with hetero-sexual experience present a different problem, not unlike that of the young adults. Conditions for coitus are far from favourable and inhibiting influences are many. They approach coitus as a test situation with consequent anxiety and fear of failure. They wish

to be assured of their potency and seek advice for marriage. When erections are strong and the patient is under 25, the chances are that, with reassurance and a little assistance from sedatives, he will be able to have a satisfactory coitus in marriage but the older the individual the firmer does the premature ejaculation get established as a conditioned reflex. When erections do not occur it would be risky to advise the patient to marry; for the condition is likely to be the result of psychological causes requiring deep psychotherapy. The older the patient, the poorer is the prognosis.

Summary.—A study of 100 cases of impotence in 67 married and 33 unmarried males, is presented with particular reference to its incidence according to their ages and marital states. The reasons for the failure of erection in the various age-groups are discussed at length and some of the psychogenic factors involved are indicated.

References:

1. Levis, L. H., (1953)—Sex Society and the Individual.
2. Hirschfeld, (1915)—Sexual Pathology, Emerson, Books, Inc., New York.
3. Pillay, A. P., (1948)—Disorders of Sex and Reproduction, Lewis, H. K., London.
4. Idem, (1950)—Int. J. Sexol., 3: 4, 224.
5. Idem, (1952)—Int. J. Sexol., 6: 1, p. 15-16.
6. Idem.—Sex and the General Practitioner, paper read at the XXX All India Medical Conference.
7. Stekel, (1927)—Impotence in the Male, Liveright Publishing Corporation, New York.

THE EFFECT OF ANTIBIOTICS ON SPERMATOZOA *in vitro*, SPERMATOGENESIS AND THEIR CONCENTRATION IN TESTICULAR TISSUES

Sonoca and Ides, have studied the effect of antibiotics on spermatozoa *in vitro*, spermatogenesis, and their concentration in testicular tissues. The antibiotics used in treatment of various diseases, *i.e.*, penicillin, streptomycin, terramycin, aureomycin, magnamycin, polymyxin, neomycin, and bacitracin, were used in the experiments. It was apparent from these studies that in the bacterial and spirochætal infections of the testes, adequate concentrations of the antibiotics were present in the testicular tissues to eradicate the infection.

The antibiotic most effective in increasing spermatogenesis is terramycin which stimulates the testes to produce two to three times the normal output of spermatozoa. Polymyxin was also very effective but somewhat inferior to terramycin, penicillin, and bacitracin, in producing this effect. Streptomycin had very little effect. In therapeutic concentrations the antibiotics which are currently used in the treatment of disease, *i.e.*, terramycin, aureomycin, penicillin, streptomycin and viomycin, have no effect on the motility of spermatozoa.

Polymyxin stimulates the motility of the spermatozoa. Isonicotinic acid hydrazide is nontoxic. A single dose of penicillin, terramycin, streptomycin, polymyxin, bacitracin, or magnamycin produces satisfactory therapeutic levels in the testes of rats.

With repeated injections the concentration of the antibiotic in the testes definitely increases itself in the case of polymyxin in which significant change is not observed.

Bacitracin apparently has a cumulative effect because appreciable concentration is detected in the testes a week following the last dose. —(Mod. Med., 1-10-'54 from Jour. Urol. Baltimore, 70: 947, 1953).

EARLY POST-SURGICAL AMBULATION

Though, since the second World War, the practice of early ambulation following major surgery has become widespread, its important beneficial effects apparently are not fully recognized or universally appreciated all over the world. It deserves to be employed on a greater scale. This method of management was reported by Ries in 1899, and some credit for its adoption in U.S.A. should be given to the work and reports of Leithauser.—(*J. Inter. Coll. Surg.*, 12 : 368-374, 1949).

Hesitancy on the part of the physician and surgeon in permitting early rising following surgery is due, in most instances, to their unfounded idea that it may result in interference with wound healing, in a greater chance of wound disruption and evisceration, and in unfavourable physiological disturbances and psychosomatic reactions. Actually it is prolonged bed-rest that causes additional expense for the patient and results in some undesirable physiological changes.

Through disturbances in metabolism, prolonged bed-rest produces weakness and loss of tone of both smooth and skeletal muscles, loss of calcium and nitrogen from the body, reduced vital capacity, decreased cardiac output, slowing of circulation, and a delay in wound healing. These changes may result in an increased incidence of complications of the gastro-intestinal tract, as evidenced by ileus, constipation, nausea, vomiting, and/or decrease or loss of appetite. Pulmonary complications such as pneumonia and atelectasis may develop as a result of prolonged recumbency and lack of breathing exercises. These difficulties include poor pulmonary ventilation, decreased pulmonary circulation, retention of broncho-alveolar secretions secondary to depression of the cough reflex, and inhibition of the thoracic and abdominal muscles on account of pain. The slowing of the peripheral circulation predisposes to thrombophlebitis and phlebothrombosis, which may result in pulmonary embolism or infarction.

On the other hand, early ambulation enhances wound-healing and reduces other gastro-intestinal, cardio-pulmonary and peripheral-vascular complications. It is also a great morale-booster, brings about a more rapid rehabilitation of the patient, shortens his hospital stay, and facilitates a better utilization of existing hospital beds.

The patient should be encouraged to get out of bed before the end of the day on which he had his operation, or on the first day thereafter, and he should be permitted to stand, walk and sit. Deep-breathing and leg exercises should be instituted immediately after the patient recovers from the anaesthetic, and should be continued, along with the other activities, increased in duration, during the succeeding days of his post-operative hospitalization.

Dr. Palumbo and his coworkers at the Des Moines Veterans Administration Hospital made a carefully conducted survey of the results in about 4,000 major surgical cases in 1953. According to that study, all types of complications—vascular and urinary system—occurred twice as frequently in the group of patients who were ambulated late. Getting patients out of bed early did not increase the incidence of post-operative hernia. Even in cases of inguinal hernia, a recent study of 1,300 cases revealed no substantial difference in the rate of recurrence between the early and the late ambulatory groups.

It is apparent that early ambulation has many beneficial effects upon the post-surgical patient. The complication rates in all categories can be markedly reduced without any undesirable effects upon the patient in general or upon his wound, and without significantly increasing the chances of mortality. Such a programme, when properly conducted and supervised, is a great factor in the rapid rehabilitation of the patient, results in a great monetary saving to him, to the hospital and to industry, and permits a greater utilization of existing hospital beds. A more widespread adoption of an early ambulatory programme in the care of the surgical patient appears warranted, since it is both anatomically and physiologically a sound policy.—(*J. Iowa State Med. Soc.*, Jan. 1955).

A GLIMPSE INTO AYURVEDA*

P. L. DESHMUKH, M.D. (Bom.), D.T.M.H. (Lond.), F.C.P.S. (Bom.),
F.A.C.C. (U.S.A.), F.C.C.P. (U.S.A.),
Hon. Physician, Sassoon Hospitals, Poona

THE study of Ayurveda, has received considerable impetus, since India achieved her independence. Ayurveda is a science which India can proudly call her own, and it is indeed, a most ancient, comprehensive and organized system of medicine. It has therefore, rightly come to lay claim to nationalism in medicine in India.

The four Vedas form the foundation of Indian culture. They discuss the philosophy of life and death, and help a man to achieve the four important objectives in life (पुरुषार्थ) viz. religion (धर्म), wealth (अर्थ), progeny (कर्म), and absolution (मोक्ष). Ayurveda gives us the secret of health which is most essential for achieving success in everything in this world. For it is said that 'Health is the primary means for achieving religion' (शरीरमायं खलु धर्मसाधनम्). Hence Ayurveda is sometimes called the Fifth Veda.

Available references date the origin of Ayurveda to prehistoric times. In the age of the Puranas (पुराणकाल) Indra (इन्द्र) learnt the principles from Bramhadev (ब्रह्मदेव) and taught to Bharadwaja (भरद्वाज) who enjoyed a long and happy life as a result of the knowledge. Bharadwaja (भरद्वाज) imparted the knowledge of Ayurveda to other sages. One of them named Atreya Punarvasu (अत्रेय पुनर्वसु) developed it and taught it to six distinguished pupils named Agnivesha (अग्निवेश), Bheda (भेद), Jatukarna (जातुकर्ण), Parasara (पराशर), Harita (हारित), and Ksharapani (क्षरपाणि). Of these—Agnivesha (अग्निवेश) was the first to write a treatise on it and was thus the author of the first known work on—Ayurveda, Agnivesha Tantra (अग्निवेश तन्त्र). Later the other five disciples of Punarvasu (पुनर्वसु) also wrote on Ayurveda and the six works together are known as Shad-bhishag-samhita (षड्भिशगसंहिता). There might probably be other treatises prior even to Agnivesha Tantra (अग्निवेश तन्त्र), as descriptions about some herbs with their medicinal properties and some diseases appear in the Rig-Veda (ऋग्वेद) and Atharva-Veda (अथर्व वेद) whose dates of origin in the prehistoric times, is still a matter of conjecture.

Since ancient times the Indian system of medicine has been divided into two branches viz. Medicine (कायचिकित्सा) and Surgery (शल्यतन्त्र). Punarvasu, who taught Agnivesha, is considered to be the father of Indian medicine, and Dhanvantari Devidas (धन्वंतरि देविदास), a king of Kashi, to be the father of Indian surgery.

Charaka (चारक) is the first important comprehensive treatise on medicine written by Charaka (चारक). It is mainly adapted from

* Specially contributed to the ANTISEPTIC.

Agnivesha-tantra of Agnivesha. Later it was modified and supplemented by Dridhabala (दृढबल), son of Kapibala. The date of origin of Charaka is not defined but is roughly thought to be more than 500 years B.C. Thus Charaka, as is available to-day, is the composite work of three authors Agnivesha (अग्निवेश), Charaka (चारक) and Dridhabala (दृढबल). There are eight chapters in Charaka, dealing with different subjects of medicine. Chapter 1 known as Sutra-sthana (अग्निवेश) gives introductory information about health and long life, and describes technical terminology. Chapter 2 Nidana-sthana (निदानस्थान) deals with diagnosis of disease. Chapter 3 Vimana-sthana (विमानस्थान) discusses place, time, nourishment, mental condition of the patient and Tri-dosha (त्रिदोष) in relation to disease. Chapter 4 Sharir-sthana (शरीरस्थान), describes the body and its birth. Chapter 5 Indriya-sthana (इन्द्रियस्थान) describes bodily changes during health and disease. Chapter 6 Chikitsa-sthana (चिकित्सास्थान), discusses the treatment of diseases. Chapter 7 Kalpa-sthana (कल्पस्थान) describes medicaments and their effect on the body and Chapter 8 Siddhi-sthana (सिद्धिस्थान), describes different procedures in disease.

There are four works on Surgery, *viz.*, Aupdhena (औपधेनव), Aurabhra (औरभ्र), Paushkalavata (पौषकलवत), and Sushruta (सुश्रुत). Of these only the last work is now available. It is written by Sushruta (सुश्रुत) as taught by Dhanvantari Devidasa (धन्वंतरि देविदास) and is a comparatively more recent work than Charaka; it is believed that Sushruta, as available to day, is the one modified by a Buddhist author Nagarjuna (नागार्जुन) about the 1st century A.D. The structure of the book is on the lines of Charaka, described above.

About this time, Ayurveda was supplemented by another important branch of therapy, the Rasa-vaidyaka (रसवैद्यक). More minerals and elements came to be known by now and owing to the expanding means of communication between neighbouring countries, through warfare and trade, new medicines and methods were introduced into India. Mercury and alchemy are the more important among them. Greeks and Arabs picked up the Indian system of medicine which later proved to be the source of all modern medicine. About this time, Charaka and Sushruta were translated into Arabic by order of the Khalifa of Baghdad.

Mercury and other substances introduced from foreign countries formed the nucleus for Rasa-vaidyaka (रसवैद्यक), which form an important part of Ayurvedic treatment.

It will be interesting to note that Nadi-pariksha (नाडी परीक्षा) *i.e.* examination of the pulse was first introduced in Ayurvedic medicine, perhaps, from Greece where Galen had introduced it.

Mercury of Parada (परद), when triturated with sulphur produces a black powder called Kajjali (कज्जलि). When this is heated, it forms a red powder Hingul (हिंगुल) or Darada (दरद) *i.e.* red sulphide of mercury. Parada, Darada and other poisonous

substances like arsenic and aconite form important constituents of many Rasa medicaments (रसौषधि). Though mercurial reactions in relation to alchemy were introduced in India at the beginning of the Christian era, the Rasa therapy (रसवैद्यक) became generally accepted and came into common vogue only after about the 5th century A.D. It is interesting to remember that this knowledge was used first in India in the treatment of disease. At that time, the Rasa therapy was hailed as the best and as a heavenly therapy; treatment by decoctions was described as mediocre therapy, and the treatment by surgery and acids was considered to be very inferior therapy. The Rasa-therapy was particularly favoured by Shaktas (शक्त) who believed more in mantras (मंत्र), miracles, ghosts and demons. The therapy was greatly supported by the Buddhist population whose principle of (Ahimsa) non-violence set them against surgery and organotherapy which involved the killing of animals and the use of their flesh and some of their organs in the treatment of disease. Thus the emergence of Rasa-therapy gave a set-back to surgery and arrested its development.

The important works on Rasa-therapy are Rasa-tantra (रसतंत्र), Rasa-Shastra (रसशास्त्र), Rasa-kriya (रसक्रिया), Rasa-vaidyaka (रसवैद्यक), Rasa-sindhu rasarnava (रससिन्धुरसार्णव), Rasa-hridaya (रसहृदय), Raseshwar-siddhanta (रसेश्वरसिद्धान्त), and Rasa-ratna-samuchhaya (रसरत्नसमुच्चय). They were probably written a century or two before or after Christ.

Vagbhata (वाग्भट), an important work on Ayurveda, appeared about the 4th century A.D. The author Vagbhata (वाग्भट) was a Buddhist, resident in North India. Only passing references are found in this book to mercurial and other preparations included in Rasa-therapy. Vagbhata (वाग्भट), wrote two well-known books, *viz.*, Ashtanga-sangraha (अष्टांगसंग्रह) or Vriddha-vagbhata (वृद्धवाग्भट) and Ashtanga-hridaya (अष्टांग हृदय) better known as Vagbhata (वाग्भट). Ashtanga-hridaya (अष्टांग हृदय) proved to be a very popular book in India and abroad. The book owed its popularity to its concise and systematic rearrangement of the subject matter and to the lucidity of the description. Medical treatises after Vagbhata often incorporated Rasa therapy in Ayurveda. Some of the books are Vrinda-madhava (वृन्दमाधव) Vaidya-rahasya (वैद्यरहस्य), Chikitsa-sara (चिकित्सासार), Nighanta (निघंट), Madhava-nidana (माधव निघान) etc. In a work by name Veersinhavaloka (वीरसिंहवलोक) written about the 14th century, the use of astrology in medicine is discussed.

The firm rock on which Ayurveda is founded is the Tri-dosha (त्रिदोष) theory. The three doshas (त्रिदोष) *viz.*, Kapha (कफ), Vata (वात) and Pitta (पित्त) form the tripod on which Ayurveda rests. The theory holds that bodily health depends upon a proper balance of the three doshas (त्रिदोष) which constitute the three prime and vital principles of the living body, and disease is the result of a disturbance in their balance. The exact interpretation of the three

doshas has been lost through oblivion, due to a lapse in the time-honoured method of individual coaching, for many centuries past. Some eminent modern scholars believe that the Tridosha theory of Ayurveda begins where the knowledge of modern physiology ends. The theory attempts to explain the vital processes involved in the functioning of the living organism. The terms Kapha (कफ), Vata (वात) and Pitta (पित्त) do not simply mean phlegm, wind and bile but the terms appear to be symbolic of a much deeper meaning not wholly comprehensible to us at present. A correct appreciation of the Tridosha theory will greatly assist in the proper understanding of the disease processes and in guiding the treatment.

Ayurveda, the Indian system of medicine has thus a glorious past with a philosophy of its own. It is a science complete in itself and has adequately served the Indian population for hundreds of years. The Indian pharmacopœia is large and contains numerous potent herbs and drugs. All the herbs grow on Indian soil and need not be imported. Unfortunately the knowledge about the identification of some of the herbs has been lost to us with the lapse of time. Anatomy and surgery were quite exhaustive for the age, during which Ayurveda flourished and when dissections were forbidden. Clinical observations on a number of diseases including Panduroga' (पाण्डुरोग), jaundice, hemiplegia, epilepsy, and ascites are very accurate. Surgery included abdominal surgery, eye surgery and plastic surgery. The observations in the section on obstetrics appear astonishingly modern in some respects². Several references to operations like cesarean section and version are found therein. It was not the practice in those days to write detailed descriptions about diseases and their treatment. Most of the references are therefore, very brief and abridged in the form of Sutras (सूत्र), the explanations of which were learnt from the Guru or teacher. Thus, the spoken and not the written word was the chief medium of instruction.

It is indeed a matter for great regret that owing to the absence of this kind of teacher-pupil relationship in the periods of continuous unrest in India during the last many centuries, no progress has been made in this remarkable science, and what is worse, the proper interpretation of many Sutras has been lost to us. The loss of the correct interpretation of the Tridosha theory is a major and a vital loss to Ayurveda. Prolonged intensive research alone will enable Ayurveda to recover its place of pride in the realm of modern medicine.

References:

1. Deshmukh, P. L., (1930)—The Antiseptic, May.
2. Deshmukh, P. L., (1932)—The Antiseptic, July.

Jayashree,
Deshmukhwadi,
Poona City.

Choose the Glucose Powder that best suits your patient's needs

When a patient needs a Glucose preparation, you may feel that he needs one containing Vitamins. Or you may prefer to give him pure Glucose and prescribe a separate preparation for Vitamins, should they be indicated. In either case, there is a preparation made by Corn Products Company — who have been manufacturing Glucose powders longer than anyone else.

GLUCOVITA and DEXTROSOL are Glucose preparations that have been tried and proven by doctors all over the world.



It is not enough to prescribe 'Glucose-D'. Prescribe GLUCOVITA — Corn Products Company's brand name for Glucose with Vitamin D and Calcium Glycerophosphate



DEXTROSOL, 99.8 per cent pure, is Glucose in the purest form available anywhere. It is anhydrous — it does not even contain water of crystallisation

CORN PRODUCTS COMPANY
(INDIA) LIMITED

BOMBAY 1

CALCUTTA 1

Every tin of genuine DEXTROSOL and GLUCOVITA bears this COPROCO symbol





Nocturnal Excursions

are frequently the occasion of falls in elderly patients suffering from increased frequency of micturition.* The local analgesic action of 'Pyridium' on the urinary tract, and its relaxing effect on the sphincter of the bladder, will often help to ensure an undisturbed night. There is no general sedation or blunting of the faculties with

PYRIDIDIUM

*Practitioner (1954) 172, 643-4

MENLEY & JAMES, LIMITED (Incorporated with limited liability in England)
141 Fort Street, Bombay

Sole Distributors in India: PHARMED LIMITED, P.O.B. 1185, Bombay

'Pyridium' is the trade mark of Nepera Chemical Co., Inc.

UAP94Ind

CYST(E)INE IN HEALTH AND DISEASE *

V. MAHADEVAN, M.A., D.Sc., F.R.I.C.,

Professor of Animal Nutrition, Madras Veterinary College, Madras-7

THOUGH cystine was the first amino-acid to be discovered in urinary calculus as early as 1810, by the British physician Wollaston, who called it cystic oxide, it was only recognised nearly 90 years after its discovery, as a constituent of protein, when Morner announced in 1899 to the Swedish academy the isolation of cystine from the acid hydrolysate of horn. The name Cystine was given to cystic oxide by Berzelius in 1832 and the presence of sulphur in it, was shown by the French scientists, Baudrimont and Malaguti in 1837. In the beginning of this century, between 1902 and 1905, the brilliant investigations of several chemists like E. Fisher, E. Erlenmeyer, E. Friedmann and others in Germany, established its structure synthesis and identity. Thus it took 95 years to determine definitely the origin and constitution of cystine.

Osborne and Mendel in the United States, showed first in 1915 the 'nutritional importance of cystine as influencing growth in albino rats on a diet of casein or milk protein, poor in sulphur containing protein and l cystine, the natural amino-acid, was recognised to be an indispensable or essential amino-acid. The d-cystine and d-cysteine were incapable of accelerating growth. But Jackson and Block, in 1932, discovered that methionine was as effective as cystine in promoting growth and methionine could produce cystine required for the metabolic processes in the animal body. The mechanism of the formation of cystine from methionine in the body in main steps through homocysteine and serine and the intermediate compound cystathionine, was soon established by other workers. By these studies, methionine was recognised to be the essential amino-acid and cystine was a dispensable amino acid. However, cystine, has been shown even in earlier studies, to influence nitrogen and energy retention in animals and men. It increases appetite. Whipple has long regarded cystine as the "key" amino-acid in plasma-protein synthesis. Recent studies also show how cystine plays a fundamental part in normal health and in disease conditions. Thus our conception of the dispensable or non-essential nature of amino acids must be revised or understood differently as they are involved normally in the fabrication of tissue proteins. Though their lack can usually be overcome by synthesis, the necessary raw materials and the many steps and mechanisms involved in their synthesis, should not be interfered with either wholly or partly, in which case the normal metabolism and health may be affected. Cystine illustrates the importance of the so called non-essential amino-acid in many of the physiological functions.

* Specially contributed to the ANTISEPTIC

[373]

51—vi

Occurrence of cystine in the body.—Cystine is present in widely varying amounts along with the essential amino-acid methionine in all animal and plant proteins. In some of the essential components of body proteins, it is present in very high concentrations even to the complete exclusion of methionine; thus keratins, like hair, wool, horn, hoof, feathers, contain 11 to 16%; egg-proteins 1 to 3%; serum proteins 3.6%; glutathione (?); insulin 13%; pressor and oxytocic hormones 18 to 19%; thyroglobulin 2 to 4%; pituitary lactogenic hormone 3%; and enzymes like cytochromes, pepsin, trypsin, thrombin, etc. also contain it. Insulin contains its entire sulphur as cystine, which is 13% as rich as hair or wool. Pituitary oxytocic and pressor hormones contain 18 to 19% cystine with almost nil or very little methionine. In crotoxin, the active neurotoxic and haemolytic principle in rattle-snake venom, the sulphur content is about 4% and about 88% of the sulphur is present as cystine and approximately 7% as methionine.

Animal foods, leguminous seeds and leaf proteins are generally deficient in sulphur amino-acids. Crystalline wheat-peptide contains 15% cystine with very little methionine. Milk-protein is very poor in cystine.

The role of cystine in metabolism.—The functions of cystine, like those of other amino-acids in general are:—(i) the formation of structural units in tissue proteins, (ii) detoxication, (iii) production of enzymes, (iv) synthesis of hormones, (v) formation of peptides of tissue extracts, having important functions, as glutathione, (vi) formation of nucleoproteins and certain body-lipids, and (vii) the formation of antibodies.

Recent isotopic tracer techniques have shown the dynamic state of these units in proteins of the body as opposed to the classical conception of static structures, in dynamic or constantly exchanging equilibrium with food amino-acids, indistinguishable from the tissue protein units.

Cystine as a structural unit in hair and wool.—(1) Cystine in the diet specifically influences the growth, quality and quantity of cystine in the fur of laboratory animals and in the wool of sheep. Kempy wool or defective hair is the result of nutritional deficiency in cystine or methionine and can be corrected by supplements of cystine or methionine to the diet.

(2) Cystine or methionine is beneficial under certain conditions only for the purpose of keratinization. Cystine with a non-protein diet influences the growth of hair by more than 20%, drawing all the other amino-acids from the body reserves. But cystine with all the other amino-acids except tryptophane, has no effect on hair growth.

(3) In the absence of tryptophane, cystine has no effect on fur or wool growth.

(4) Lysine and methionine concentrations in fur or wool are constant, while the cystine concentration may vary according to the alterations in the levels of cystine or methionine in the diet, within biological optimum levels.

Cystine in glutathione.—Glutathione (γ-glutamyl-cysteinyl-glycine) is a tripeptide of glutamic acid, cysteine and glycine. It takes part along with Vitamin C in the oxidation and reduction mechanisms in the body. It contains cysteine in its reduced form. On oxidation, the cysteine is converted to cystine and two molecules of the tripeptide are joined in the disulphide linkage. It is also an activator for certain proteolytic enzymes like papain, cathepsin, urease, etc. It is also a coenzyme for methyl-glyoxalase, which transforms methylglyoxal to lactic acid. It is present in the protein or carrier part of many enzymes such as succinic dehydrogenase, phosphoglyceraldehyde oxidase, pyruvic acid oxidase, malic acid oxidase, phosphoglucomutase, etc. Thus the function of glutathione is connected with many reactions in the body in a more general way. It revives cell-growth or cell-division, which is arrested by mercury salts. It acts as a detoxicant of cyanides and arsenic poisons. The SH-group of proteins takes part in the cell-divisions. It also intervenes in the fixation of carbon dioxide on the pyruvic acid molecule. Its importance in liver damage will be discussed later.

Cystine in detoxication mechanisms.—Cystine plays an important role in detoxicating mechanisms in the body involving aromatic hydrocarbons and their derivatives, as bromobenzene, naphthalene, and anthracenes, which are of particular interest from the medical point of view. Benzene, a well-recognised industrial hazard, damages the bone marrow and causes aplastic anaemia, leucopenia and thrombocytopenia purpura. Naphthalene, fed to rabbits, causes cataract similar to the senile type occurring in men. Other hydrocarbons of a more complex type possess carcinogenic properties.

Cystine is used for the formation of mercapturic acid by the oxidation of sulphur which becomes attached to the ring or side-chain aliphatic group and subsequently the amino-group of cysteine radical is acetylated. Thus bromobenzene, though harmless by itself, deflects cysteine from its normal metabolic path to the mercapturic acid conjugation, thereby robbing the body of an adequate supply of this amino-acid. Mercapturic acid is thus used to conjugate and excrete the unsubstituted aromatic ring.

Other substances like iodoacetic acid, and cholic acid are also detoxicated by cystine. Cystine is also used for the formation of taurine, which produces the taurocholic acid present in the bile.

Cystine in cobalt and nickel toxicity.—Cystine, cysteine or methionine, largely prevented the marked inhibition of growth in

young rats on an 18% casein diet containing 0.12% cobalt sulphate. The high mortality due to the oral or intraperitoneal administration of toxic levels of cobalt or nickel, was prevented by the simultaneous or separate administration of cysteine. The complex formed *in vitro* between cobalt and cysteine, was relatively non-toxic. This explains cobalt-poisoning as due to the fixation and loss of SH- (sulphydryl) compounds in the tissue which interfere with the oxidation mechanism.

Cystine and crotoxin.—Eighty eight per cent of the sulphur present in crotoxin is in the form of cystine, having the disulphide linkage. When crotoxin is treated with cystine, it splits the disulphide linkage and the toxic activity of the venom is lost. Thus cystine acts as an antitoxic agent to this active neurotoxic substance, whose specificity seems to be in the preservation of its specific in-tact-disulphide structure.

Similar specificity of disulphide-linkage in the hormone, insulin molecule for its physiological activity, is necessary and the reduction of its disulphide group to sulphydryl groups results in loss of activity.

Excretion of cystine in normal health.—On a low protein diet containing 0.7 g. of protein per kg. of body-weight, which would maintain the subjects in nitrogen equilibrium an average of 66 mg. per 70 kg., of body weight, per 24 hours was excreted in the unhydrolysed urine and 236 mg., cystine, four times more on a high protein diet containing 1.36 g of protein per kg., whereas the other amino-acid excretion varied only from 10 to 25 per cent. The fourfold increase in cystine excretion by normal subjects on the high protein diet suggests that dietary control is essential in all clinical studies on the excretion of this amino-acid.

Cystine in cystinuria.—Cystinuria, like all other inherent errors of metabolism, is hereditary. It is characterised by the excretion of abnormally large amounts of cystine in the urine as well as lysine and arginine. Even during fasting, the excretion of cystine continues and cystine forms calculi, or concretions due to its insolubility. Cysteine, di-methionine and leucine, when given orally, increase the cystine excretion in cystinuric individuals. But administered cystine does not increase the excretion of cystine, showing that cystine in food is completely metabolized in this condition. It is shown further that the increased excretion of cystine by di-methionine orally, is less in the cystinuric individual on a high protein diet than on a low protein. The plasma levels of these amino-acids are however normal in cystinuria and there must therefore, be a low renal threshold to explain their excretion.

In contrast, during the damaged condition of the liver known as "hepatic cystinuria" in mild liver disease, when a high or plasma level of cystine prevails, cystine is excreted in less concentration than in cystinuria without any lysine or arginine.

Cystine in liver disease.—Acute liver necrosis is produced in rats by a diet deficient in sulphur amino-acids and tocopherol or vitamin E. The lesions are prevented by cystine and methionine or vitamin E supplement, showing that sulphur amino-acids deficiency is one of the contributory factors to liver necrosis. There is wide variation in the glutathione content of the liver in protein-starvation and cystine deficiency. Normal rat-liver contains about 230 mg., per cent glutathione, 92% of which is in a reduced form. On a necrogenic diet, the level falls to 84 mg. per cent within nine days, and the reduced form is only 70% of the total. Vitamin E supplement does not change the glutathione content, but makes the rats live in a normal condition with this subnormal glutathione level. In the continued absence of vitamin E, the rats become suddenly ill and necrotic, when the glutathione level falls down to 20% of its normal value, of which only half is in the reduced form. The final fall of glutathione in necrotic livers is accompanied by a sudden fall of non protein nitrogen from about 200 mg. % to about 100 mg. %. The Vitamin C level of the liver fell from 38 mg. to 26 mg.% in 12 days and remained so until necrosis occurred. Necrotic liver contained practically no Vitamin C. A 0.6% cystine supplement prevented liver necrosis and maintained the normal liver glutathione level. At the necrotic stage, when the non protein nitrogen and the glutathione levels in the liver are the lowest, amino acids and cystine are excessively excreted in the urine. These changes are similar to those observed in human cases of acute liver damage. The sudden death of the liver cells stops the de-aminating action of the liver and releases in the blood large amounts of glutathione and amino acids leading to a rise in plasma amino acids and to a consequent amino-aciduria.

The histological changes brought about in the liver by a cystine-deficient diet are a spotted and enlarged appearance with dark red coloured spots and pale gray yellow sectors of varying size. The organ is friable. A marked fatty degeneration of the capillary endothelium takes place. This is also found to some extent within the liver cells. There is often necrosis without preceding fatty degeneration. Simultaneously expanded haemorrhages are seen in several lobes. In some cases, in which liver degeneration had apparently taken place more slowly, an early cirrhosis was seen, as also regenerative phenomena in the still-surviving liver cells. In some cases the spleen shows strongly marked haemorrhagic tumour. The kidneys show a striking pallor. In the kidneys degenerative changes in the endothelium are observed as well as symptoms of glomerulitis; the changes observed are nearly the same as those observed by others in animals which are given excessive quantities of cystine. The other organs do not show any difference. These changes resemble those observed in human eclampsia, whose cause is not yet definitely known—whether it is due to a cystine

deficiency or is caused by accepted toxins. At any rate, it is a striking fact that pregnant rats also cannot stand a diet deficient in cystine. The eclampsia of rats can be prevented by the addition of small quantities of tocopherol to their diet.

Antibiotics like aureomycin, terramycin and streptomycin and the chemotherapeutic sulphaguanidine have a beneficial effect in significantly delaying the production of massive necrosis. The antibiotics have antioxidant effects and sulphonamides exhibit antithyroid effects. Like vitamin E, they may have somewhat similar action in preventing massive necrosis.

TABLE I: Showing the Dietary Factors in Liver Injury

SUBSTANCE	CIRRHOSIS	NECROSIS
Protein	Beneficial	Beneficial
Methionine	Beneficial	Beneficial
Cystine	Injurious	Beneficial
Choline	Beneficial	Beneficial
Vitamin E	No effect	No effect or injurious
Dietary fat	Injurious	Beneficial
Vitamin B12	Beneficial	No effect or injurious
Antibiotics	?	No effect
		Beneficial

The rise in cystine levels in the urine may be a very sensitive indication of liver-damage.

Cystine and antibody formation.—As plasma-proteins are rich in cystine, cystine has long been regarded as the key amino-acid in plasma-protein synthesis. The antibodies are modified plasma-globulins, which are formed more slowly in hypoproteinaemic animals than in normal ones. The albumin and globulin contain 5.58 and 2.37% half-cystine as compared with 1% methionine. The elevated globulin levels in chronic hepatitis may be due to the increase of antibodies. The suprarenal cortical hormones, ACTH and cortisone inhibit the formation of antibody globulin.

Cystine in tuberculosis.—Cystine excretion in the urine rises above 400 mg. per day in this disease as compared with the normal level of about 80 mg.; this may be even used as a clinical test for early diagnosis.

Cystine in selenium-poisoning.—Seleniferous soils concentrate selenium in plant-leaf-proteins (more than 300 p.p.m.) in the form of selenium-cystine units in which S is replaced by Se. Selenium up to 16 p.p.m. in food is not poisonous. At more than this level, by eating Se vegetations, the animals suffer Se poisoning or alkali disease or blind staggers, with loss of hair, emaciation and hoof-abnormalities. Necrosis, regeneration of hepatic parenchyma with periportal fibrosis and resulting cirrhosis occur. Selenium poisoning in human subjects also show similar symptoms besides skin affections. The affected animals and men exhibit a garlic-like odour or an arsenic-like odour in their mouth and breath.

Selenium poisoning can be cured by sulphur-bearing green vegetables or a sulphur-rich diet, containing cystine or methionine, to replace the selenium by sulphur in the selenium-cystine units in the proteins of the body. Apparently selenium instead of sulphur concentrates in plant proteins due to drought conditions.

Cystine and cancer.—“The abnormal behaviour of cancer cells is an expression of abnormalities in their chemical make-up.” (Toennies: 1947). Voegtlin and his associates have found that certain amino-acids such as cystine, methionine and lysine, which are necessary for normal growth are necessary also for the growth of mammary-gland-carcinoma. Cystine content is decreased in tumour tissue as compared to homologous normal tissue.

In 1939, Kogl and Erxleben, in Germany, found in protein hydrolysates of malignant tumours, a considerable amount of glutamic acid and a smaller percentage of certain other amino-acids in dextro rotatory form or as unnatural isomer, while in normal tissues only the laevo-rotatory stereo-isomers occurred. Other investigators were however unable to confirm these observations. But recent studies carried out by me in France on a pure nucleoprotein isolated from tumour tissues in experimental rats, using microbiological and chromatographic methods of amino-acid assay in the protein hydrolysate, showed the presence of the entire cystine in dextro-form, the unnatural stereo-isomer. This confirms the observation of German workers cited above. It brings out clearly the advantages of employing simultaneously chromatographic and microbiological assays for the amino acid mixtures in biological materials.

Cystine added along with vitamin B complex and choline to the rice diet of rats to which, butter-yellow (dimethyl-amino-azobenzene) the carcinogenic substance was administered, prevented the development of carcinoma of the liver.

Though selenium oxides and compounds are toxic, the oxides of selenium if taken orally in small quantities seem to contribute to the oxidation of body sulphur or cystine sulphur and it is used for this reason in the treatment of cancer. This illustrates another important aspect of sulphur and selenium inter-relationship in sulphur-containing protein-units. Here the substance Se usually detoxified by cystine sulphur, actually functions as the detoxifying agent for the cystine present in the abnormal form in cancer tissue. This fact seems to be more common with respect to cystine-metabolism. For, by feeding bromobenzene which is usually detoxicated by cysteine (selenium cysteine in selenium poisoning), it is conjugated with it and thereby eliminated from the body.

The optical specificity of cystine.—*d*-cystine is inactive, whereas *l*-cystine or its precursors *dl*-homo cysteine or *dl*-methionine, is only active. This high specificity of *l*-cystine seems to be important in normal biological functions. Glutathione, itself,

fixes the asymmetry, keeping the reactive SH group. The enzyme cysteine sulphurase, which is involved in the oxidation mechanism of cysteine, liberating H_2S and thiosulphates, does not act upon *d*-cysteine; whereas homocysteine sulphurase acts on both *d* and *l* homocysteine. Meso-cystine has growth-promoting properties, showing that the body can reduce this molecule to *d* and *l* cysteines. *l*-cystathionine formed from *l*-homocysteine and *l*-serine, the intermediate compound in the synthesis of cystine from methionine and serine, has *l*-configuration on both asymmetric centres and is split in such a way as to yield only *l*-cysteine, but not *l*-homocysteine.

It, therefore, replaces cystine, but not methionine in the diet. *d*-cystathionine, which has *d*-configuration on both centres, is not available for growth. *l*-allo cystathionine, which is S (1-B-amino-B-carboxyethyl) *d*-homocysteine, is split to yield *d*-homocysteine and possibly *l*-serine; the homocysteine replaces the *l*-isomeride and since homocystine can be converted in the presence of choline into methionine and cystine, the unnatural allo-compound supports growth and is biologically active. *d*-allo-cystathionine, which potentially yields either *d*-cysteine or *l*-homocysteine, is not available for growth.

The excretion of *d*-cysteine derivatives.—If the cysteine derivative fed, has *d*-configuration, inversion occurs in many cases and the excreted mercapturic acid, is related to *l*-cysteine in configuration. Sometimes, racemic compounds are isolated showing *d*-cysteine can be acetylated, conjugated and excreted. This shows under special conditions *d*-cysteine can take part in synthetic reactions.

Both *d*- and *l*-cysteines are attacked anaerobically by propionibacterium pentosaceum at equal rates with the H_2S and ammonia; by contrast, *d*-cystine is attacked to a comparatively slight extent only in the presence of *l*-cystine and it is suggested that this is due to some reduction of *d* cystine under the conditions of the experiment. *d*- and *l*-cystines are attacked equally readily by a mixed culture of the intestinal microflora in the dog.

d-cystine in antibiotic.—*d*-amino-acids are present in antibiotics, some ergot alkaloids and B-anthraxis capsules and confer resistance towards enzyme attack. *d*-amino acids favour cyclopeptide formation present in the antibiotics. The universal presence of *d*-acid suggests that this configuration has special significance in relation to antibiotic action.

Du Vignaud *et al.*, (1946), have shown that penicillin may be synthesized from *d*-cysteine or *d*-penicilline, whereas the isomer from *l*-penicillamine is biologically inactive. Peptides containing *d*-amino-acids have specific enzyme-inhibiting and chemotherapeutic properties.

Pharmacological properties of *D*-isomers.—All the natural amino-acids belonging to the natural series, whether *l*- or *d*-

rotatory, have an insipid or bitter taste, whereas the *d*-series have a sweet taste. Pituitti, in 1886 first noted the difference in the physiological properties of optical antipodes, *viz.*, *d*-asparagine sweeter than *l*-asparagine. Pasteur's remarks on Pituitti's discovery, "*La matiere nerveuse est une matiere dissymetrique comme toutes les substances primordiales de la vie*," show that even before the time of Ehrlich, Clark and Cushny, Pasteur was a strong believer in physiological receptors, asymmetrically built. Meaty taste, not being sweet, bitter, sour or salt, is due to sodium *l*-glutamate, whereas the racemic salt has a sweet taste. *d* isomers of some amino-acids have even toxic properties. *e.g.* serine *l*-cysteine has histaminolytic effect. *l*-carnosine has a pharmacological action, while the *d*-isomer has none.

ANTICOAGULANTS IN CORONARY DISEASE

In the past ten years anticoagulant therapy in diseases of the coronary arteries has become an important feature of cardiological practice. Many physicians have now gained practical experience of it, but there has been much difficulty in determining its true value and indications. Anticoagulant therapy is laborious, uncomfortable, expensive, and potentially dangerous. It is therefore, hardly surprising that it is an unpopular form of treatment which would have been abandoned with joy, if it had proved of little worth. Indeed, there are some who plead with vigour that there is no justification for its use in any form of coronary arterial disease (*Proc. Roy. Soc. Med.*, 47: 1954). Others share the more moderate view of Schnur (*Circulation*, 7: 1953) that anticoagulants should be used only in severely ill, "poor risk" cases of myocardial infarction. Schnur has recently published his views (*J.A.M.A.*, 156: 1127, 1954) in the form of an interesting catechism, in which he suggests that only about 10 per cent of cases of acute myocardial infarction are likely to benefit from anticoagulant therapy. This is the group of patients who are liable to develop thromboembolic complications, and Schnur appeals for research into the methods by which such patients may be recognized.

A paper from Gilchrist and Tulloch published recently in the *B.M.J.*, (1954: 2, 720) gives a valuable aid to readers who have been confused by the subject. These authors summarize the pathology of coronary arterial disease, include a reminder of the confusion which arises from slipshod nomenclature, and present a concise account of their experience. They reaffirm their faith in the value of anticoagulant therapy in all cases of acute myocardial infarction, except for patients who suffer from complications such as anaemia, peptic ulcer, and gross hepatic or renal disease. They add to the increasing body of evidence that such treatment reduces both the mortality and the complication rates in the first six weeks after an acute infarction, and they stress the danger of coming to a decision early in the course of treatment that any particular case is a "good risk." On the other hand Russek and Zohman (*J.A.M.A.*, 156: 1130, 1954) consider that deterioration of the condition of a good-risk case is relatively uncommon, though they agree that such a deterioration is an indication for the immediate use of anticoagulants. These authors give their criteria for the selection of good risk cases and record a series of 489 treated without anticoagulants with a mortality rate of 3.1 per cent. They estimate that about 30 per cent of all cases of acute myocardial infarction require anticoagulant therapy and stress its value in the poor-risk case. Hill (*Practr.*, 173: 379, 1954) expresses a widely held view that it is not justifiable to withhold anticoagulant treatment from any patient with an acute myocardial infarct unless specific contraindications exist. Indeed, if it is true that anti-

coagulants are capable of preventing thrombosis in the coronary vessels, there is an excellent argument for their use in the milder cases. The less the initial damage, the greater is the scope for the prevention of further infarction. More work is required to determine the effect on prognosis of anticoagulant therapy for about four weeks after an acute myocardial infarction. It might well prove difficult to justify the expense, labour, danger, and discomfort of the treatment if it should be shown that the patients are spared only to fall victim to recurrent infarcts when their treatment is withheld.

Long-term anticoagulant therapy as a preventive measure in patients who have previously had an acute infarct or are suffering from increasing angina raises interesting problems. Its value is not yet established, but there have been some encouraging reports. Nichol *et al.* (*Med. Clin. N. A.*, 38: 399) have treated 177 patients with "impending myocardial infarction" or acute coronary insufficiency. Nine (5%) suffered from myocardial infarction while under treatment and 10 out of 27 patients who stopped treatment had an "acute coronary attack" within one month, and 8 of them died.

Gilechrist and Tulloch (*loc. cit.*) have clearly detailed the practical difficulties and the dangers of anticoagulant therapy; such treatment should never be instituted therefore, unless it is possible to control it with daily estimations of the prothrombin activity by a competent technician and daily examination of the patient for signs of hæmorrhage, including microscopical hæmaturia. Opportunities for the use of anticoagulants in general practice are necessarily limited by these inescapable requirements. With the increasing, though still experimental, use of anticoagulants for long-term preventive therapy, many patients will be taking these drugs at home. In such cases it is likely that the doses will be adjusted at the out-patient clinic, but the danger of hæmorrhage is always present and the circumstances the administration of 25 to 50 mg. of Vitamin K, is the most appropriate counter-measure in addition to the necessary local treatment. The use of anticoagulants in no way removes the need for applying all the more established and traditional methods of treatment which have proved of value in the past. This point should always be kept in mind while anticoagulant therapy is considered.—(Annotation in *Br. Med. Jour.* of 5th Feb. 1955).

IS BLOOD PRESSURE BEING READ PROPERLY?

Conventional techniques do not give true blood pressure readings, Dr. Howard P. Lewis told a conference group, on June 24, 1954 at the annual meeting of the A.M.A., San Francisco. According to Dr. Lewis, the blood pressure cuff should be inflated more slowly than is the usual practice and the column should fall at the rate of no more than 2 to 4 mm. Hg. per heart beat. Too fast a fall, he cautioned, will give a false reading.

At this same conference, Dr. Charles F. Swigart, commenting on blood-pressure readings, suggested that serial readings over a period of weeks or months are necessary before the physician can conclude his patient has hypertension or is a candidate for hypertension. A single examination or a limited series of readings, he stated, is not conclusive.—(Conference report Ciba).

MEDICAL MAXIMS OF AN INTERNIST

That patient who weeps as he describes pain over the precordium is neurotic. If a patient complains of a symptom or a group of symptoms referable to any organ over many years, that organ will eventually break down.

The very first symptom of a given complaint may be the most important. If, for example, epigastric pain, nausea and vomiting are preceded by headache, the latter is the cardinal symptom and is an expression of cerebral disturbance.—(*Cur. Med. Dig.*, Dec. 1954 from *J. Mich. St. Med. Soc.*, April 1954).

ADVANCES IN CARDIAC THERAPY*

B. M. KOTHARY, M.B., B.S.,
Physician, Bharatpur

‘ONCE a heart patient, always a heart patient’ was often the disappointing verdict of the physician, and his qualifying remarks that one could still lead a useful life within the capacity of his heart was hardly comforting to the patient or his relatives. Time was when every heart patient with a murmur was condemned to life-long worry and invalidism. Precise anatomical diagnosis was not considered even worth the trouble, for there was nothing to offer by way of cure, except that complications like congestive cardiac failure were somewhat amenable to treatment. Making a diagnosis of congenital heart disease was not unlike signing a death warrant. In short, there was neither a radical cure of the ætiological cause nor any successful preventive measures.

The over-all picture today is not however, so gloomy. The ætiology has been carefully and thoroughly studied and understood; and preventive measures have been devised. And what is more, it is now possible to effect a radical cure in some suitable cases, through advances in the techniques relating to investigative procedures, anaesthesia and cardiac surgery. Experimental work both in medical and surgical fields had made vast strides. With the help of electrocardiography, angiography, aortography, tele-radiography, auricular catheterisation and other elaborate techniques, it has been possible to better visualise the working of the heart and the nature of the pathological lesion and to make a precise anatomical diagnosis. And above all, the surgeon has now the courage to dive into the chambers of the heart and carry out the most delicate operations on the different structures therein. Hibernation, draining of heart by the artificial ‘Heart-Lung’ apparatus and safer anaesthesia, have all helped considerably in the elaboration of the modern highly skillful operative procedures.

A new and highly enchanting vista has no doubt been opened but considerable skill, experience and circumspection are required in tackling problems relating to heart diseases; it may not be possible to reverse the pathological process in every case; all murmurs may not disappear; it may sound much too optimistic to believe that every cardiac patient will be on his feet again. But the progress made so far has raised hopes, that in the near future it may be possible to cheer up and brighten the prospect of many cardiac patients who were hitherto doomed to life-long invalidism and premature death. This is indeed very promising and constitutes a great improvement on the old picture, when the ‘heart patient’ was a source of constant anxiety to the physician, because

* Specially contributed to the Golden Jubilee issue of the ANTISEPTIC

medical therapy was limited in scope, palliative at best and often powerless against an inexorable course.

Let us first consider the prevention of heart disease. Rubella during pregnancy is believed to cause congenital heart disease in the offspring. Prophylactic measures are directed towards the protection of the mother from infection and/or immunization. Rheumatism still ranks first as the aetiological cause of acquired heart disease. Continuous small doses of sulpha drugs or D.B.D. penicillin may prevent frequent recurrences of rheumatism; but the prevention of cardiac involvement during an acute attack remains still unsolved, despite the antibiotics and other newer therapeutic agents like ACTH and cortisone, which though capable of dramatic results are of doubtful value in modifying the natural course of the disease. The development of heart disease as a sequela to hypertension can be checked by early treatment of high blood-pressure, by sympathectomy and by the administration of several new drugs like methonium and Hyphex. Syphilis is now very amenable to treatment with antibiotics, and so cardiac complications should be much rarer. Arteriosclerosis, atherosclerosis or the process of ageing are ill-understood subjects, and consequently preventive measures with drugs like methionine are of doubtful value.

The advances in medical therapy have been rather limited. Indications for digitalis therapy have been crystallized, and the art of digitalisation has been more or less perfected. Newer glycosides and safer mercurial diuretics have been added to the physician's armamentarium. Antibiotics, cortisone and ACTH offer considerable promise in being able to tackle some of the cardiac situations dramatically. Subacute bacterial endocarditis with its sequelae, which formerly was a dreaded and fatal disease, is now controllable. Ganglion blocking agents of the hexamethonium group and Hyphex have been found useful in dealing with hypertension. The value of 'Heparinisation' has been established, and safer anticoagulants have been evolved. Pronestyl is the latest which is being used in the treatment of fibrillation. Induction of 'medical thyroidectomy' with the thiouracil group of drugs or with radioactive iodine has benefited many cases of angina pectoris and those with lagging myocardial reserve. Cation exchange resins have made possible a far more normal diet to cardiac patients in whom salt restriction was indicated.

The most remarkable and outstanding advances in cardiac therapy have been in the field of surgery. The proper selection of cases, correct anatomical diagnosis and precise evaluation of cardiac efficiency and contractility of the heart muscle are all essential prerequisites to successful cardiac surgery. Those cases in which cardiac weakness has developed and muscular contraction is poor, are to be deemed poor risks for surgical intervention. However, ligature of the inferior vena cava below the level of the renal veins can

re-establish a more satisfactory circulatory balance and restore cardiac efficiency by reducing the blood flow to the right side of the heart and improving the supply to the left, provided that the contraction of the cardiac muscle is satisfactory. It is amazing to find how dramatically this procedure controls cardiac failure; oedema, dyspnoea and enlargement of the liver disappear, which were previously resistant to conventional methods of treatment. And above all some of these cases now become fit for other surgical techniques like valvulotomy, which previously were unthinkable. It must be stated, however, that this operation is purely a palliative one and is applicable to uncompensated mitral lesions rather than to cardiac insufficiency due to generalised arterial causes. The decision about the suitability of the patient may be decided after measuring pressures in the heart-chambers by cardiac catheterisation. Another method of assessing prognosis is a test spinal anaesthesia, which brings about temporarily, the same circulatory changes as those produced by this operation and gives one a preview of the benefits likely to be derived from ligature.

Now we come to the surgical treatment of individual valve lesions. It must be emphasised here that such lesions should either be congenital or cicatricial; in other words, there should be no active pathological process developing on the valves—which will be a definite contra-indication for surgical intervention of any kind.

(1) Mitral lesions are the most amenable to surgical treatment. Surgeons started with shunting operations, *e.g.*, the anastomosis of the pulmonary vein with the azygos vein to relieve pulmonary hypertension. But the results were neither radical nor predictable. Then followed the direct attack on the valve itself. Digital separation of the sclerosed valves was later replaced by Brock's punch and recently by commissurotomy with a specially designed valvulotome. Valvuloplastic operations have been devised for mitral incompetence, but considerable further research work will be necessary to achieve uniform success. (2) Aortic lesions are more difficult to deal with, as they are often highly thickened, calcified and inflexible. After excluding calcification by tomographic examination of the heart valve, dilatation of stenosed valves by suitable dilators through the common carotid artery or left ventricle has been tried, but the results have not been very encouraging. For aortic insufficiency, attempts have been made to narrow down the orifice by fibrous bands, grafted aorta, and artificial plastic valves; but plastic surgery should develop to a much greater extent before satisfactory results may be achieved. (3) Operations for constrictive pericarditis have been very successful. The heart muscle can now be satisfactorily sutured for traumatic wounds. Arterializing the venous coronary sinus by anastomosing it to the aorta, augments the blood-flow to the myocardium and thereby relieves severe coronary insufficiency. (4) In the matter of congenital malformations,

the results have been even more remarkable. Patent ductus arteriosus can be ligatured and divided (transfixation ligation), and normal life resumed thereafter. The ever-present fear of bacterial endocarditis and pulmonary embolism is allayed and dwarfism gives place to a healthy figure. Intra-atrial openings can be closed by invagination. Pulmonary stenosis or Fallot's tetralogy, the commonest cause of 'Blue babies' has been corrected by Brock's punch or by anastomosing the pulmonary artery with the aorta or subclavian artery. These shunting operations were widely practised by Blalock and Pott and the disappearance of cyanosis was considered a miracle. For stenosis lower down, infundibulotomy has also been successfully carried out. Coarctation of the aorta has been corrected by excision of the stenosed area and re-anastomosis.

Endocardiac surgery has been made possible by providing the surgeon a comparatively dry field for the requisite length of time. This has been achieved either by temporarily arresting the blood flow through the heart by clamping or by ganglion-blocking drugs along with hibernation. The latter procedure aims at reducing the oxygen demand of the body cells when the body is chilled and thermo-regulation blocked. Shivering during hibernation is controlled by suitable drugs like 'French lytic cocktail.' More ideal conditions for bloodless heart surgery can be obtained by diverting the blood-flow into the new device called the 'Heart-lung' apparatus.

In conclusion, it may be said that the advances in cardiac therapy have altered many of the older concepts relating to the pathological physiology, the natural history, and the prognosis of several heart diseases. New developments in cardiac surgery have, in selected cases, corrected deformities in the heart valves, as a result of which many totally disabled persons have been rehabilitated and restored to useful and even normal activity.

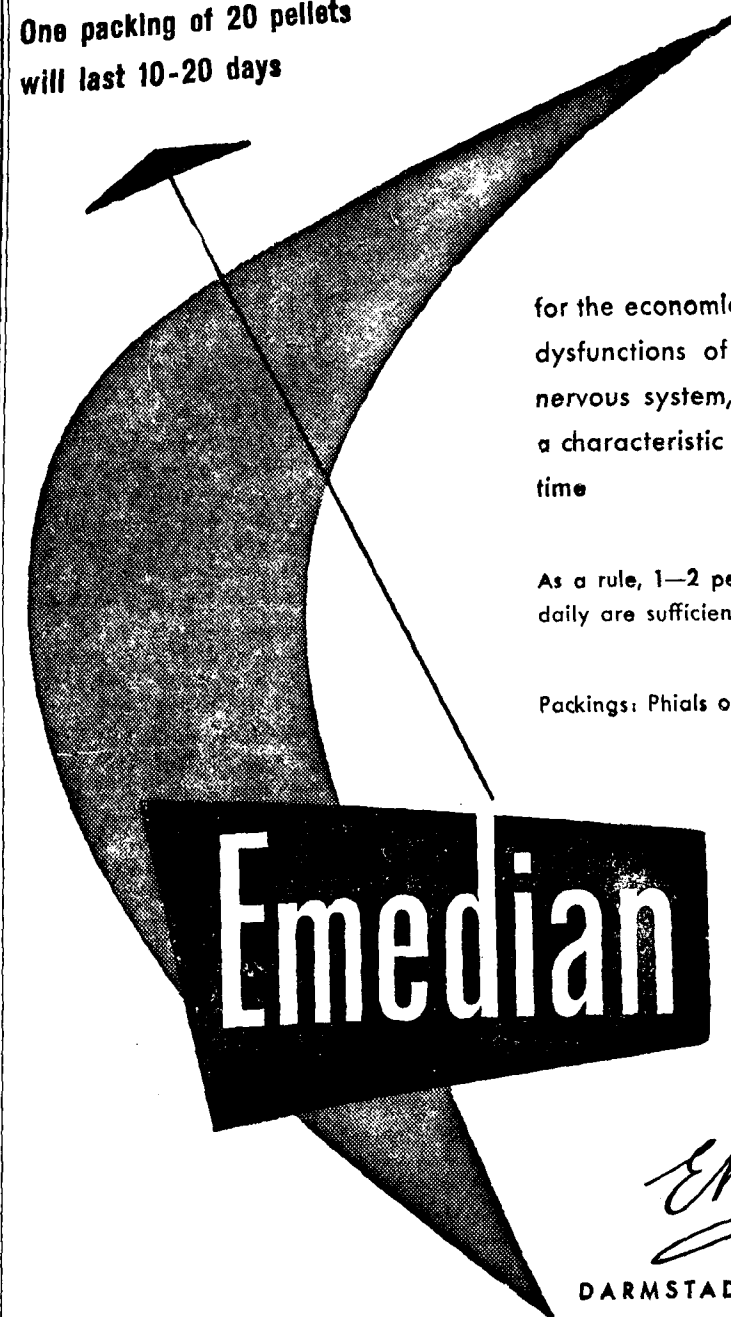
CONTROLLED HYPOTENSION

Controlled hypotension is the deliberate lowering of blood pressure to decrease the danger of certain operations, to diminish blood loss during surgical intervention, and to facilitate and expedite surgical procedures.

It is induced by causing a discrepancy between the circulating blood volume and the capacity of the vascular system. This may be accomplished either by reducing the blood volume by arteriotomy or by increasing the capacity of the vascular system through vasodilatation. The vessels may be dilated by pre-ganglionic sympathetic block (spinal anaesthesia) or by the use of a ganglioplegic drug.

Contraindications to induced hypotension include severe, advanced coronary disease, angina pectoris, and marked impairment of renal function. Of the various methods of anaesthesia used, intravenous sodium pentothal as the chief anaesthetic agent and endotracheal nitrous oxide-oxygen mixtures or oxygen alone has proved satisfactory. Less anaesthesia is needed during hypotension. Morphine and the barbiturates used as preoperative agents contribute in some degree to hypotension. (*Anaesthesiology*, January 1955, pp. 1-10).

One packing of 20 pellets
will last 10-20 days



for the economical treatment of
dysfunctions of the autonomic
nervous system,
a characteristic symptom of our
time

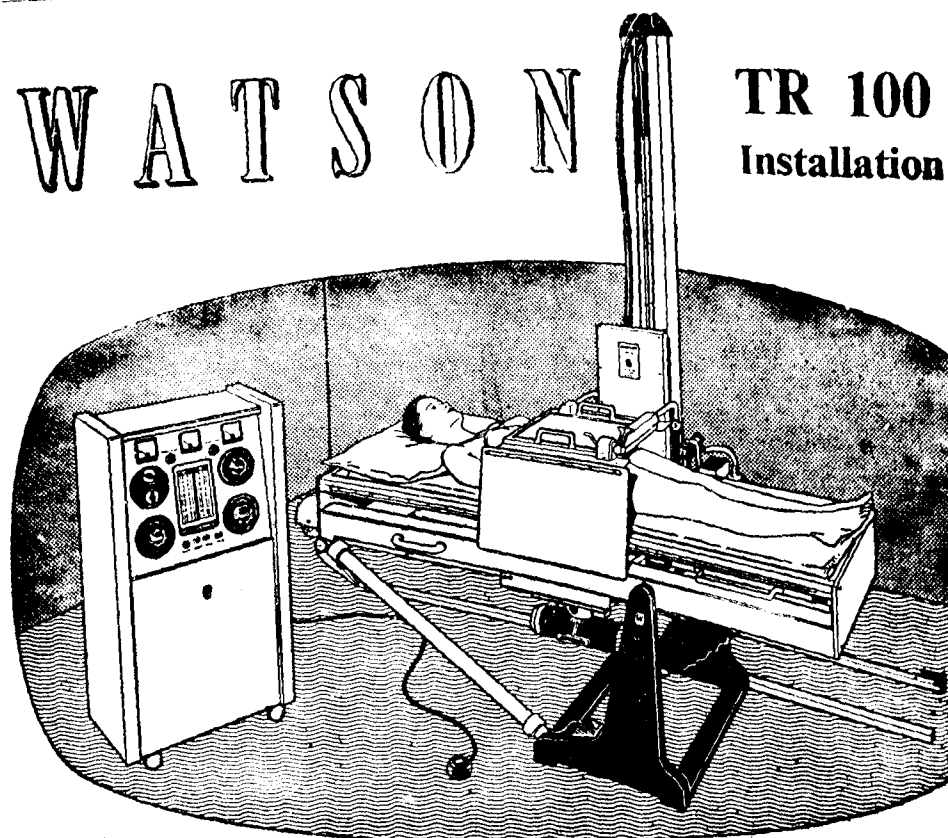
As a rule, 1-2 pellets of Emedian
daily are sufficient

Packings: Phials of 20 or 100 pellets

Emedian

DARMSTADT · GERMANY

Sole Agents in India
Capco Limited — E. Merck Dept.
P.O. Box 1652 Fort, Bombay 1



For the small hospital, the clinic, or private practice, this up-to-date installation combines efficiency with economy both in initial cost and in maintenance. It has facilities and the necessary output for all normal diagnostic procedures and radiographic results can be produced in accordance with the higher standards of today. It can also be used for superficial therapy, if required.

The table is handled with equal ease in the vertical or horizontal position with the X-Ray tube either above or below the table. Facilities for serial radiography of the gastro-intestinal tract can be incorporated.

Having an output of 100 kVp. and 100 mA., the generating unit can fully energise the latest type of light-weight dual-focus rotating anode tube, or the more orthodox dual-focus stationary anode tube.

For further particulars please write to :

G.E.C.

THE GENERAL ELECTRIC COMPANY OF INDIA LIMITED
Magnet House, Chittaranjan Avenue, Calcutta 13
Branches at :
Bombay Madras Kanpur Delhi Bangalore Coimbatore Secunderabad
(Representing : THE GENERAL ELECTRIC CO. LTD. OF ENGLAND)
Also represented in : Karachi Lahore Chittagong Rangoon

GEC 288

ACIDOSIS*

GANENDRA KUMAR CHAKRAVARTI, M.B.,
Teacher of Pathology, Ronaldshay Medical School, Burdwan

THE normal pH of the body fluid lies between 7.35 to 7.46—i.e. a slightly alkaline range, which is constantly maintained, notwithstanding the intake of acid foods. *e.g.*, carbohydrates and fats which produce carbonic acid, and proteins which yield organic acid radicals like sulphates and phosphates. In diseases, the pH of blood very rarely falls below 7 or rises above 7.8. The reaction of the blood needs to be maintained, like our body temperature at a constant level in order to sustain life in good order. This is achieved by a very delicate mechanism controlling the reaction of blood and body fluids and carefully regulating the excretion of acid and alkaline substances.

The acid-base balance is kept up by :—(1) dilution ; (2) damping ; and (3) excretion. Acids formed during metabolism are at once diluted by rapid distribution through the whole mass of body fluid. The next process known as "damping down" of the acidity is effected by buffer substances in the blood, like bicarbonates, phosphates and proteins and strong acids are replaced by weak acids in the buffer salts. The most sensitive buffer is NaHCO_3 , and its importance lies in the rapidity with which it can function through the respiratory action, although the range of function is rather small. The phosphate and protein buffer with greater bulk, act slowly with the help of the renal function, but play a major part in acid-base balance.

Finally comes the process of excretion of acid or alkaline substances which are in excess of requirements. The lungs and the kidneys are the primary organs of excretion.

The lungs:—The sensitive bicarbonate buffer functions rapidly through respiratory action. The normal ratio in human blood is as 1:20— $\text{HCO}_3/\text{NaHCO}_3$, and this should always be maintained by proper respiratory action. An abnormal amount of fixed acids (Cl , SO_4 and lactate) results in a high arterial H_2CO_3 content $\rightarrow$ tends to lower the pH of blood $\rightarrow$ stimulates the chemoreceptors $\rightarrow$ increases respiratory centre $\rightarrow$ increases pulmonary ventilation $\rightarrow$ alveolar CO_2 is lowered by being washed away $\rightarrow$ arterial H_2CO_3 is lowered (because arterial H_2CO_3 tension equilibrates with alveolar CO_2 tension) $\rightarrow \frac{\text{H}_2\text{CO}_3}{\text{NaHCO}_3}$ is restored to normal.

The kidneys:—Normally excrete nitrogenous wastes, and maintain the volume, osmotic pressure and the pH of the interstitial tissue fluids and of the plasma.

The pH of the tissue fluid and plasma is kept within narrow limits by suitable adjustments during the selective re-absorption of

*Specially contributed to the ANTISEPTIC,

[387]

NS—VIII

the electrolytes by the tubules. Average mixed diets give rise to SO_4 , PO_4 , Cl (acid radicals) in excess of Na^+ , K^+ , Ca^+ , Mg^+ (fixed bases); but the kidney compensates this excess acidity by excreting a highly acid urine and tries to conserve the fixed base by covering the acid radicals with the ammonia synthesised by it from the urea of blood. The final reaction of the tissue fluid and plasma is determined by the ratio between the amount of free dissolved carbonic acid and of bicarbonate ions. As already mentioned the respiratory mechanism deals with the carbonic acid. The concentration of the bicarbonate ions varies inversely with the acid radicals so that an increase in the acid radicals causes a proportionate decrease in the bicarbonate ions and *vice versa*.

In diabetes, free acid is excreted in the urine directly in the form of *beta*-hydroxybutyric and di-acetic acid. If an excess of acid still persists ammonia is formed by the kidney and eliminated in the urine by combining with the acid radicals in lieu of bases. Hence in acidosis the proportion of ammonia nitrogen in urine is often greatly increased. If however, the kidney be functionally or organically damaged this synthesis of ammonia is hampered and the acid radicals are then necessarily covered by the blood buffer bases and excreted in the urine involving a progressive depletion of fixed bases from the body. As the concentration of bicarbonate ions (HCO_3) varies directly with the concentration of fixed bases of the body, this depletion of fixed bases causes a lowering of the plasma bicarbonate which thus gives rise to acidosis. But if all the acids are not eliminated even by combining with ammonia formed by the kidney and if the pH of the urine reaches the extreme limit of pH 4.8 about 99% of the urinary phosphate is excreted as NaH_2PO_4 . Here the phosphate buffer covers the acid radicals and is excreted as the acid sodium phosphate involving a sodium loss.

The carbonic acid tension of blood can be rapidly changed by pulmonary ventilation, resulting in an abnormal H_2CO_3 content or NaHCO_3 content in blood, the other blood buffers however, remaining normal. The two factors which the body primarily regulates are: (1) the arterial H_2CO_3 pressure and (2) the buffer of acidosis and alkalosis as respiratory or metabolic; when the primary disturbance is increasing, blood $\text{H}_2\text{CO}_3 \rightarrow$ respiratory acidosis *e.g.* in severe emphysema, extensive bronchopneumonia, depression of respiratory centre, convulsive apnoea and when the primary disturbance is decreasing in blood, $\text{H}_2\text{CO}_3 \rightarrow$ respiratory alkalosis *e.g.* in hyper-ventilation-syndrome of psychoneurosis, in encephalitis, in hyper-thermia, and in high altitudes. When the buffer base of the blood is primarily disturbed towards depletion $\rightarrow$ metabolic acidosis. When the buffer base of the blood is primarily disturbed towards excess $\rightarrow$ metabolic alkalosis. The term *alkali reserve* is used as a name for the total quantity of CO_2 bound as bicarbonate in plasma,

and not the total base of blood. It has already been mentioned that the pH of blood depends on the ratio of $\text{H}_2\text{CO}_3 : \text{NaHCO}_3$. Therefore, the pH of blood has nothing to do with total bicarbonate or alkali reserve. This distinction between total bicarbonate of blood (alkali reserve) and NaHCO_3 only is important, as this explains how a low or high alkali reserve is possible without any change in plasma pH. For evaluation of the magnitude of acid base disturbance, the usual practice is to estimate the CO_2 -combining power of plasma, on the supposition that (1) the base available for immediate damping down of acids exists in the plasma in combination with CO_2 *i.e.*, as bicarbonates; (2) other buffer systems of blood are of comparatively minor importance; and (3) that the pH of blood does not alter even if the alkali reserve varies widely. The values determined in normal persons show that between 56 and 74 cc. CO_2 are held in 100 cc. of plasma. The volume of CO_2 combined at a definite tension (that of alveolar tension, 40 mm. Hg.) in the plasma is measured for this purpose. The other buffer systems of blood are not to be regarded as of minor importance in comparison with the bicarbonate system. Also, it has been found that pH of blood does vary within narrow limits, and that change in pH will alter the buffering action of protein especially haemoglobin, so that plasma buffer base will be altered by chloride (Cl) shift between plasma and RBCs. The discovery of these factors has rendered the proper evaluation of the magnitude of acid-base disturbance insufficient by estimating the CO_2 -combining power of plasma or alkali reserve. Additional knowledge of plasma pH is essential for a proper understanding of the actual condition. These facts show that the former definition of acidosis, as the condition which brings about a decrease in the alkali reserve is untenable. Acidosis and alkalosis should be accurately used to denote abnormalities in the plasma pH. It is possible to find a low or high alkali reserve with or without abnormal pH. Thus, whatever may be the status of the CO_2 -combining power of plasma (alkali reserve), the state of alkalosis or acidosis is dependent on the high or low pH value of blood.

Causes of acidosis.—**A.** (1) Entry of exogenous acids in the blood *e.g.* ingestion of acids or acid salts. (2) Excessive production of endogenous acids due to metabolic activity. **B.** Reduced elimination of acids by final excretion: (1) by lungs, due to defective lung circulation, (2) kidneys, when there is inability to excrete a highly acid urine or acid radicals like phosphates, sulphates, etc., or inability to synthesise ammonia. **C.** Loss of bases from the gastrointestinal tract during diarrhoeal states.

Causes of alkalosis.—(1) Ingestion of base in excess, as in Sippy treatment of peptic ulcer. (2) Excessive H_2CO_3 loss by hyper-ventilation as in primary respiratory alkalosis referred to above. (3) Loss of strong acids from body as in protracted vomiting.

A. (1) *Ingestion of acid or acid salts*:—Ammonium chloride or calcium chloride is given therapeutically. When NH_4Cl is given, the ammonia is converted to urea, the chloride is neutralized by the bases of blood and both substances are excreted in the urine with an increased volume of water. When CaCl_2 is excreted by the gut the chloride unites with the base and is excreted with increased volume of urine. In both cases the restoration of acid-base-equilibrium is accompanied by loss of base and loss of water from the body. (2) Excessive production of endogenous acid by metabolism occurs in:—(a) metabolic disorders like diabetes, (b) starvation due to inadequate carbohydrate intake; and (c) hyperemesis gravidarum and cyclical vomiting in children due to inadequate carbohydrate absorption. All such cases show increased NaH_2PO_4 excretion, the presence of ketone bodies, an increase in the amount of ammonium salts in urine. There is a reduction of plasma bicarbonate in the blood, as also a reduction in alveolar CO_2 tension.

When a reduction occurs in carbohydrate oxidation, whether as a result of decreased carbohydrate absorption from the intestinal tract, or a diminished intake of carbohydrate or defective utilisation by the tissues, fat is utilised in greater quantities for the energy requirement of the body as a whole. Under such conditions there is an increase in the transport of fat to the liver from fat depots, in order to help hepatic ketogenesis by either *beta*-oxidation or multiple alternate oxidation or *beta*-oxidation—acetic acid condensation theory. The human body can oxidise ketone bodies satisfactorily, especially the muscle tissues. It is not true that fats are burnt in the fire of the carbohydrates. There is little evidence to show that *beta*-oxidation of fats ever occurs in the body; rather is it true that fatty acids are broken up into a series of ketone bodies in one process. Under resting conditions, it has been found that the normal human adult body can metabolise ketone bodies to the extent of about 175 g. of fat per day. But if the hepatic ketogenesis occurs at such a rapid rate that the body tissues are unable to dispose of all the ketone bodies by oxidation as quickly as they are formed, then ketosis results. This is what actually happens when a carbohydrate deficiency occurs; the glycogen store in the liver is depleted, the liver has to do the work of ketone body formation from fatty acids at an accelerated rate (which exceeds the normal capacity of the body tissues to oxidise them); an accumulation of ketone bodies in the blood gives rise to ketosis. In cases of diabetes when severe ketosis persists, dehydration appears, partly due to vomiting and partly due to the diuretic effects of glycosuria and mainly due to acidosis. This dehydration will ultimately lead to hypotension and peripheral circulatory failure. The dehydration being the result of acidosis is always associated with loss of bases. Renal function is impaired by the severe hypotension following dehydration, so that extra-renal azotæmia appears with retention of PO_4 , SO_4 due to the inability of the kidneys to form a strongly acid urine. Sodium

is lost through the kidney and part of it combines with the keto-acids of the blood. If this process is allowed to continue without further adequate treatment, the kidney function worsens, ammonia is not synthesised and more fixed bases therefore, pass out of the kidneys as the retained SO_4 , PO_4 radicals are covered by sodium in the blood. The azotæmia and acidosis progress. This is known as the stage of "inorganic acidosis" which will persist even after ketosis is abolished unless the depleted sodium is replaced by fresh supplies from outside.

B. (1) Reduced elimination of acids by final excretion through lungs. This occurs in conditions enumerated under primary respiratory acidosis which give rise to poor pulmonary circulation → non-removal of H_2CO_3 from blood → respiratory acidosis. Here carbonic acid is the cause of acidosis, the respiratory regulation of acid-base disturbance having failed to function. The phosphate buffers will now have to control this acidosis. They act in the following way:— $\text{H}_2\text{CO}_3 + \text{Na}_2\text{HPO}_4 = \text{NaHCO}_3$ (absorbed in blood) + NaH_2PO_4 (excreted in urine).

The NaH_2PO_4 is excreted in the urine; one molecule of NaHCO_3 being added to the total bicarbonate of blood for every molecule of carbonic acid eliminated from it. Thus there may occur an increase in the blood alkali reserve in proportion to the rise in H_2CO_3 tension in blood and the rise in alveolar CO_2 tension, although there may be loss of sodium from the body. Here a determination of the CO_2 -combining power of plasma or CO_2 tension in alveoli, will be inadequate to give correct information of the acid-base status of the body. The determination of the pH of blood is essential.

References :

1. Sodeman, (1950) — Pathological Physiology.
2. King, E. J. — Micro-analysis in Medical Biochemistry.
3. Hadfield and Garrod — Recent Advances in Pathology, 5th Edition.

TOXIC EFFECTS OF CITRATED BLOOD

Citrated blood consists of venous blood, is less alkaline than arterial blood, and becomes more acid on storage. Further more, on storage, there is a rise of plasma potassium-ion concentration. The potassium-ion produces effects upon the heart similar to those caused by a lack of free calcium-ion. In the absence of free calcium the heart soon becomes weak and goes into arrest in diastole. Cookson and his co-workers felt that an arterial transfusion often administers the "coup de grace" to a moribund patient.

As the result of experimentation, they have found the use of erythrocytes in Ringer gelatin solution (ERG solution) to be effective and the material of choice for transfusion in cardiac surgery. In cardiac cases, as much as 24 cc./kg. has been administered without harmful effects. — (Ann. Surg., 139 : 430, 1954).

HYPERTENSIVE HEART DISEASE *

S. R. DAS,
Cardiologist, 24/1, Creek Lane, Calcutta-14

HYPERTENSION usually means the elevation of the intra-arterial pressure above the usually accepted normal range. From actual experience, I consider that this accepted normal range should be understood to mean the pressure at which there is no subjective complaint, for the particular individual. The accepted range of pressure like age+100 or age+90, may produce clinical symptoms of hypertension in some persons. Transient rises in blood-pressure are not uncommon as a result of physiological response to fear, anger, emotion, anxiety etc.

High blood-pressure is not a disease entity but only a physical sign (hyperpiesis) reflecting a disturbance of one or more of the various factors which control the level of the systemic arterial pressure. It is often a chance discovery at a routine physical examination. In the early stages, the rise in blood-pressure may be moderate and intermittent and *per se* produce no symptoms.

AETIOLOGY:—Essential hypertension constitutes 80 to 85 per cent of all cases. Hereditary, psychic, and endocrine factors are all believed to be contributing factors, but the primary cause has not so far been definitely established. Many consider that renal vascular disease is responsible for initiating hypertension by causing ischaemia. Some do not agree with this view and think that it is a later development in response to the high intra-vascular pressure. I am inclined to agree with the latter theory. In my experience, the primary cause for initiating hypertension has been the imbalance in the autonomic nervous system *i.e.* the equilibrium between the sympathetic and the parasympathetic nervous tone gets disturbed, the most common condition of which is amphotonia—overexcitation of both divisions of the autonomic nervous system. Typical symptoms of autonomic imbalance include labile blood-pressure, vertigo, gastro-intestinal disturbances, as evidenced by indigestion, flatulence, irregular bowel movements, hot flushes, headaches, insomnia, emotional instability etc.

The causes for the autonomic imbalance.—The typical causes for the described syndrome of autonomic imbalance are certain endocrine changes *e.g.*, menopause, overwork and emotional stress, physical and psychic trauma (concussion of the brain and psychic shock), toxins as in tuberculosis and other infections. In our country—the most common factor lies in the chronic bowel disorder as evidenced by the history of an attack of dysentery, amoebic or bacillary, flatulence, passing of mucus in stool and constipation.

SIGNS AND SYMPTOMS:—Among the first clinically recognizable effects on the heart due to hypertension is hypertrophy of the left

* Specially contributed to the Golden Jubilee issue of the ANTISEPTIC

ventricle. However, symptoms may not appear for years until cardiac dilatation is superimposed, when signs and symptoms of congestive failure usually become manifest. In the early stages of heart failure blood-pressure readings may show a high level but may fall to near about normal as the failure progresses or as general vasomotor collapse supervenes. In such cases the diastolic pressure may be maintained at a moderately high level, even though the systolic pressure falls to 150 mm. Hg. or less in proportion.

In recent years, a distinction has been drawn between left ventricular failure and right ventricular failure. Failure of the two major chambers produce different symptoms because these are concerned with supplying blood to different parts of the body. A knowledge of the characteristic symptoms helps to evaluate accurately the clinical condition and plan suitable treatment with greater accuracy.

Left heart failure results from excessive prolonged strain upon the left ventricle. In arterial hypertension where there is increased pressure on the peripheral circulation the left ventricle gets hypertrophied as a result of increased demands upon the myocardium in its attempt to maintain the effectiveness of the heart as a pump. In time, however, the heart is unable to cope with the increased load and fails to pump the normal volume of blood into the aorta.

In consequence, stagnation within the left ventricle and in the pulmonary circulation must result when the right ventricle, not being under abnormal strain, pumps its full quota of blood into the pulmonary artery with every stroke, by which a considerable amount of blood can be trapped within the lesser circulation. In a short time exudation from the distended pulmonary vessels occurs, clinically manifested by shortness of breath, cough and rales.

Right heart failure is seen in the end stages of arterial hypertension as the pressure within the lesser circulation rises when eventually the compensatory effort of the right ventricle becomes excessive. As the right ventricle fails, blood accumulates within the greater circulation producing the common symptoms of dependent oedema, venous congestion, enlarged liver and dyspnoea. By way of compensatory mechanism venous congestion removes blood from the circulation, reducing the burden upon the heart.

(1) Dyspnoea is perhaps the first complaint of the patient with congestive heart failure; it may occur in the beginning on effort, but as the circulatory efficiency gradually gets lowered it will occur on less and less exertion and eventually even when the patient is at rest. In hypertensive cardiac failure—a special type of dyspnoea is frequently seen, known as paroxysmal nocturnal dyspnoea, which occurs primarily at night, an hour or two after the patient has retired and is manifested by extreme air hunger and perspiration. It awakens the patient suddenly from sound sleep, terrifies both the patient and his

relatives and produces a feeling of impending death which by leading to further emotional stress aggravates the original condition.

Many theories have been advocated to explain the mechanism of this type of dyspnoea, which will not be discussed at length in this article.

(2) Oedema—is another early sign of congestive heart failure, appearing first in the lower legs and ankles only at the end of the day and disappearing in the morning but persists, when failure progresses, even during sleep and rest and slowly works its way upwards to the heart. In severe congestive failure oedema of the hands and face is seen especially when renal failure starts. If the condition is not treated, oedema of the flanks, as well as ascites, and eventually generalised anasarca may gradually develop.

There are again several theories about oedema formation; Warren and Stead state that when salt is given to congestive heart-failure patients a decrease in cardiac output causes a reduction in the renal excretion of sodium and water, which in turn causes an increase in the blood-volume, an elevation in venous pressure and a subsequent oedema. In support of the role of sodium in oedema formation, Merrill and Mokotoff *et al* have demonstrated that in congestive heart-failure the decreased sodium excretion is due to a reduced filtration rate and not to altered tubular re-absorption.

Goodyer has presented evidence that ascites formation is the result of a specific impairment of the renal excretory mechanism for sodium and that the retention of sodium by the kidneys is due to an increased tubular re-absorption.

(3) Venous engorgement—is seen in the neck and even in the hands in right heart failure; gradually the generalised venous engorgement seen, accounts for the high venous pressure already referred to.

(4) Liver—It gets enlarged from passive congestion, though sometimes the liver gets enlarged without venous distension or increases in venous pressure—as in tropical countries.

After recovery, even the liver may remain somewhat enlarged but it is then less tender to palpation. The tenderness which accompanies its enlargement is caused by a stretching of the capsule. Clinical jaundice is often masked by cyanosis. Although clinical jaundice may be absent in some patients with congestive heart failure, latent jaundice is invariably present.

(5) Weakness is a frequent complaint, which may be due to a reduced oxygenation of the tissues, or to a poor assimilation of food, owing to the deranged condition of the liver and the gastrointestinal tract. Impairment of digestion and gastric symptoms like anorexia and flatulence are common complaints in many cases, due to venous engorgement in the stomach.

(6) Constipation and windiness in the bowels, are the frequent complaints. On deep palpation of both the right and left flanks there may be tenderness in the colon; microscopical examination of faeces may or may not reveal cysts of *amœbæ* or *giardia* or simply mucus; the reaction of the faeces may be acid. In my practice, I have found about 95.5% of hypertensive patients have some chronic bowel disorder as an associated factor. The tenderness in the colon in congestive heart failure cases may be due to engorgement in the mesenteric veins.

An ECG usually reveals some degree of left axis deviation. Other abnormalities of the ventricular complex include left bundle branch-block, a low or inverted T₁ or T₂, and alterations in the S.T. segments.

Course and prognosis.—The younger the patient when hypertension develops, the less is he likely to live for the full-span. Conversely, hypertension which begins in old age is generally not serious unless coronary disease or cerebral arteriosclerosis accompanies the condition. A persistently high diastolic pressure of 140 mm. or higher as in malignant hypertension (malignant nephrosclerosis) with congestive failure takes a rapid fatal course. Pulsus alternans, gallop rhythm, paroxysmal nocturnal dyspnoea and Cheyne-Stokes breathing are regarded as signs of grave prognostic significance. The presence of clinical jaundice is also of bad prognostic value. Hypertensive cardiac failure in diabetics also runs a rapid fatal course.

TREATMENT:—The immediate object of treatment should be to afford (i) relief to the patient from the acute distress due to gasping and air-hunger, (ii) relief from the paroxysmal attack of nocturnal dyspnoea and (iii) the restoration of sufficient physical strength and stamina.

The ideal therapeutic measures should not only lower the blood-pressure thereby relieving the load on the heart but would also arrest or eliminate the accompanying vascular disease and its progress, and greatly minimise the probability of cardiac failure. Unfortunately, such specific and effective forms of treatment are not yet available.

For lowering the blood-pressure in hypertensive heart disease, several nonspecific vasodilator drugs like nitrites, acetylcholine, dihydroergocornine, prisolone, and veratrum viride have been in use for many years but without giving adequate satisfaction. Lately, Rauwolfia serpentina and hexamethonium compounds have come to be included in therapeutics. Potassium thiocyanate lowers the blood-pressure, but individual tolerance to this drug varies widely; large doses may cause toxic effects and its use is contraindicated in the presence of renal failure, infections, blood dyscrasias or drug sensitivity.

In my experience—hexamethonium compounds and Rauwolfia serpentina have also failed to yield satisfactory results, the side-effects of these drugs have in addition produced more alarming symptoms in patients.

Surgical treatment, like sympathectomy or unilateral nephrectomy has been advocated in selected cases but only symptomatic relief and not radical cure is possible; serious post-operative complications like postural hypotension, vasomotor imbalance and impotence in males may result.

The most important measure is psychotherapy. The physician should reassure the patient and create an atmosphere of confidence and understanding and encourage him to "ventilate" his feelings.

The most beneficial effects in my experience, have been obtained by the following line of treatment:—

For immediate relief to the patient in acute distress, I inject I.M. pethidine 100 mg. atropine sulph. $\frac{1}{200}$ gr. I avoid morphine owing to its side-effects like retching and vomiting, and constipation. If the patient does not get relief, about 75 to 100 cc. of blood is let out by a syringe. If the air hunger or gasping is not relieved, oxygen inhalation under high tension with a B.L.B mask is of great benefit.

Digitalis.—This is a very important drug to relieve acute distress in hypertensive cardiac failure cases, but the heart should be well digitalized, so that the cardiac output in the decompensated heart is increased and the circulation thereby improved; the venous pressure falls, and in this way digitalis leads eventually to diuresis and the disappearance of oedema. The heart-rate should be lowered to 72 to 76 per minute and should be counted by auscultation and on no account by counting the radial pulse. Digitoxin is about the best form of digitalis as it has a higher absorption and slower elimination rate. Gold and his associates have shown that with a single dose of 1.2 mg. Digitoxin complete digitalization could be achieved in urgent cases, within 6 to 10 hrs. Digitalization of the heart can be effected also by using divided doses, but in any case, the patient should be kept under constant observation, the maintenance dose being eventually selected according to the condition of the patient: the average adult requires 0.1 mg. daily, but an occasional auricular fibrillation as a complication on a dose of 0.2 mg. digitoxin taken daily for 4 or 5 days, but when reduced to 0.1 mg. daily toxic symptoms did not occur. The dosage adjustment should be made from the clinical response obtained.

Parenteral calcium should be avoided in a digitalized patient.

Diuretics.—As cardiac failure develops, the blood volume is increased in circulation by 2 litres or more, probably because of stagnation and pooling. Consequently, the elimination of excessive fluid is desirable. For this purpose mercurial diuretics are most

beneficial, but until and unless the renal circulation improves, owing to increased cardiac output by digitalization of the heart, mercurial diuretics are practically useless.

Aminophylline (Theophylline ethylenediamine B. P.) is a therapeutic agent of value in hypertensive cardio-renal failure, a selective vaso-dilator of the coronary arteries and possesses stimulating action on the respiratory centre. It helps to build up the reserve power of the heart and reduces the venous pressure, possibly by a reduction in vaso-motor tone. This is available in 2 forms for injection; I prefer a slow intravenous injection of 0.24 g. in 10 cc. mixed with sodium acetate gr. x to xx in 10 cc. of re distilled water. This acts as a good diuretic and tends to reduce the acidosis which is common in cardio-renal failure.

If this measure fails to produce the desired effect, I prefer to inject I.V. aminophylline 0.24 g. in 10 cc. mixed with Vitamin C 500 mg. in 5 cc. and diluting the whole with 10 cc. or 20 cc. of redistilled water; I give also an I.M. injection of Mersalyl or Salypgan 1 cc. to 2 cc. procaine 2% solution 1 cc. into the gluteal region. This may be repeated every other day, for six such I.V. + I.M. injections. This may then be repeated at longer intervals depending on the response. Many practitioners may hesitate to push sodium acetate I.V. in cardio-renal failure, for fear of sodium retention in the blood, but so long as the urinary output is normal, this question need not arise. As a diluent, I prefer redistilled water to 25% or 12.5% glucose solution for better diuresis. Fluids of higher concentration given I.V. may interfere with the renal filtration process.

In order to control the root cause in hypertensive heart disease the autonomic nervous imbalance arising from chronic bowel disorders must be corrected first.

Bellergal, a combination of bellafoline, gynergen and phenobarbital, is a suitable drug for the purpose, but this can't be pushed in pregnant women with hypertension; and some patients complain of nasal obstruction. The ergotamine group of drugs may tend to keep the pressure on the high side owing to their vaso-tonic action. Belladenal mainly helps the vago-tonic condition, but the phenobarbital in it is a central sedative and likely to depress the activity of the autonomic centres in the brain stem. In divided doses, however,—e.g., $\frac{1}{4}$ to $\frac{1}{2}$ tablet thrice daily with other intestinal antiseptic drugs of the oxyquinoline group and a small dose of phthalylsulfathiazole—it gives better results, as it removes the irritability of the colon, controls the spasm and the irregular peristaltic movement of the bowel and thus helps in a better evacuation of the bowel. This plan may be continued for about 2 weeks, then stopped for a week or 10 days, and again repeated, in the same order till the tenderness in the colon totally disappears. I avoid giving purgatives or laxatives of any kind, as they aggravate the irritability

of the colon. Non-absorbent, non-irritable and bulk-forming laxatives (1 to 1½ teaspoonfuls of Isabgul husk in 3 to 4 ounces of water) once a day early in the morning on empty stomach help to remove constipation.

Rest:—Bed-rest is essential for the successful treatment of hypertensive cardio-renal failure. Restlessness should be controlled by sedatives. As soon as the distress is relieved, the patient will sleep better even with a smaller dose of barbiturates; otherwise even toxic doses of sleeping drugs may fail to induce sound sleep. So, an improvised back-rest or several pillows to keep the patient erect would make breathing easier and put him to sleep.

Diet:—The diet should be easily digestible with a restricted salt intake (only 3 to 5 g. a day) while oedema is present. A total salt restriction should not be enforced for fear of electrolyte shock from sodium depletion. Because of the implication of cholesterol in atherosclerotic vascular disease, a low cholesterol diet is also advocated.

Summary.—The root cause for hypertension lies in the imbalance in the autonomic nervous system, arising from chronic bowel disorders, as evidenced by various signs and symptoms which are set forth in some detail. In longstanding hypertension the left ventricle gets dilated and hypertrophied. High blood-pressure may be a pre-disposing factor to angina pectoris, coronary insufficiency and coronary occlusion.

As soon as cardio-renal failure develops the patient gets acute distress, like paroxysmal nocturnal dyspnoea, and gradual orthopnoea when failure progresses. treating the patient with an adequate dose of digitalis, mercurial diuretics, aminophyllin diluted with redistilled water by I.V. injection and sedatives to induce proper sleep and rest. Purgatives or laxatives are best avoided so that irritability in the colon may not be aggravated; but easier evacuation of the bowel can be induced by Isabgul husk. Colitis must be promptly attended to.

The diet should be salt-free partially—allowing only 3 to 5 g. daily.

References:

1. Goldblatt, H. et al. (1937-38)—Studies on Experimental Hypertension induced by Renal Ischemia, Harvey Lect., p. 237.
2. Page, I. H., (1942)—Bull. New York Acad. Med., 19: 461.
3. Katz and Wise, (1945)—Am. Heart. J., 30: 125.
4. Warren, J. V. and Stead, E. A. Jr., (1944)—Arch. Int. Med., 73: 138.
5. Merrill, A. J., (1946)—J. Clin. Investigation, 25: 389.
6. Goodyer, Allan V. N. et al., (1950)—J. Clin. Investigation, 29: 973.
7. Gold, H., Kwit, N. T. and Cateh M., (1942)—J.A.M.A., 119: 928.
8. Levine, S. A., (1945)—Clinical Heart Disease, Philadelphia, Pa. W.B. Saunders Company, 23rd ed.
9. Mokotoff, Reuben, Ross, George and Leiter, Louis, (1948)—J. Clin. Investigation, 27: 1.

IMMUNOLOGICAL FACTORS IN RHEUMATOID ARTHRITIS

In a special article contributed to the *Lancet* of 7th August, 1954, Dixon discusses the immunological reaction which is specific to rheumatoid arthritis. Evidence exists of a reaction to some unknown antigen in the differential sheep cell agglutination and the streptococcal agglutination tests. Among patients with subcutaneous nodules false positives are uncommon and specificity is high. It would appear that the serum factor responsible for the reaction is a protein associated with the gamma-globulins.

Cases and Comments

PATHOLOGY OF CORONARY ARTERY DISEASE

(With Autopsy Record of Two Cases)

D. BHASKARA REDDY, M.D.,

Lecturer in Pathology, Andhra Medical College, Visakhapatnam

CORONARY artery disease is not a pathologic entity, but is a clinical expression which covers a number of symptom complexes resulting from myocardial ischaemia. Deaths from coronary disease are increasing in frequency and it seems to be the most common cause of death amongst doctors and professional men. It is therefore, one of the most important cardio-vascular emergencies, with which the general practitioner must be very familiar.

The predisposing factors which favour the pathological changes in coronary artery disease, will first be discussed.

Age incidence.—The disease seems to occur more frequently in older people. According to Cassidy 70% of the people who suffer from coronary artery disease are between 50 and 70 years of age, the youngest being 26 years old. Young subjects are not completely immune to this disease. French and Dock in 1944 reported 80 cases of coronary disease in American soldiers between the ages of 20 and 36. Neumann in 1946 recorded 50 cases of coronary artery disease in people aged 25 or less.

Sex.—Males are much more frequently affected than females. Cassidy (1946) recorded this disease in 779 males and in only 221 females, in a total of 1,000 cases examined by him; this gives a ratio of 3.5: 1.

Familial.—Cases are on record where the disease was traced to past generations in the same family. A very interesting case of fatal coronary disease which occurred in homologous twins at the age of 35 and 38 respectively was recorded by Froment in 1945.

Habits.—(a) *Obesity*:—Coronary disease seems to be particularly partial to the rich as it is observed most frequently in well-fed and obese individuals. It is interesting to note in passing that in our autopsy records of 2400 cases we have come across only one case of coronary thrombosis with infarction, at the Andhra Medical College, Visakhapatnam. Professor Govinda Reddy, in a personal communication stated that during his 15 years' stay in the Department of Pathology, at the Madras Medical College, he did not come across a single case of coronary thrombosis in 2,000 autopsies. This is a very significant fact, as autopsies are usually done only on unclaimed and destitute bodies.

* From a lecture delivered in connection with the first meeting of the Old Boys' Association of the Andhra Medical College, Visakhapatnam.

(b) *Smoking*.—Tobacco has long been considered to be a factor in the causation of arterial spasm and there now seems to be convincing experimental evidence on this point. Stewart *et al* have demonstrated that the smoking of two cigarettes usually lowers the peripheral skin temperature diminishes the peripheral blood flow, and raises the systolic blood pressure, and the diastolic blood pressure even more. This is indeed a very depressing bit of news to the smoker, but he will perhaps feel a little easy in mind to know that similar results are obtained when the subject is alarmed or asked to do a difficult sum or even to take a series of deep breaths. Goetz concludes that even driving a car through heavy traffic would produce more adverse circulatory effects than even smoking several cigarettes, reclining on an arm-chair. But extensive recent investigations undertaken by the American Cancer Society with the co-operation of 22,000 volunteers, have yielded results which have established a clear-cut relationship between cigarette-smoking and the death rate from coronary diseases. How far this may be attributed to smoking, is indeed difficult to say. Only when people who have been smoking, till now give it up, will it be possible to evaluate if the incidence gets reduced.

Trauma.—The relationship between trauma and coronary thrombosis is also difficult to assess. Many cases are recorded in literature where a non-penetrating injury to the precordia has been followed immediately by thrombosis and infarction. Probably trauma precipitates thrombosis in an artery which is already the seat of atherosclerosis.

Stress.—Mental or physical stress was often believed to be responsible for cardio-vascular death. But does the modern population really work harder or live a more strenuous life than our grand-fathers did? It is really doubtful. We eat and drink much less than they did, so it is difficult to say whether stress plays a part in coronary disease.

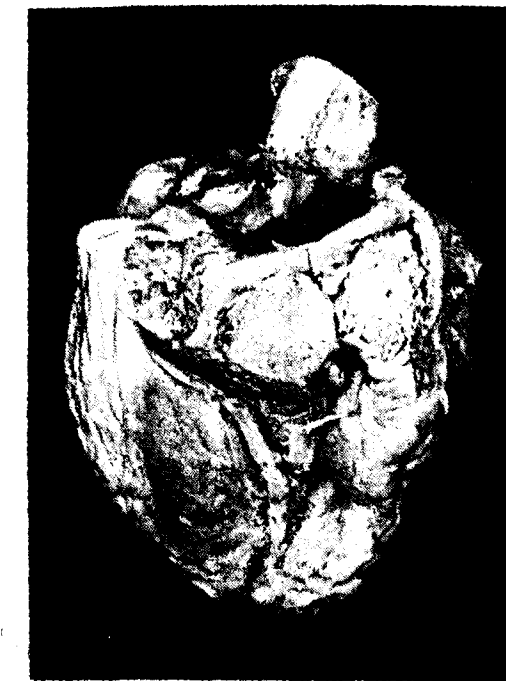
Hypertension.—Nearly 50% of the people who suffer from coronary disease have a high blood-pressure of 160/100 and at autopsy these people have revealed hypertrophied hearts with atheromatous coronaries.

Causes.—Occlusion of the coronary vessels may be produced in a variety of ways:—(1) atherosclerotic narrowing of the vessels and complete obstruction of the lumen associated usually with hypertension, (2) hæmorrhage into an atheromatous plaque, (3) rupture of such plaque into the lumen, (4) thrombosis in an already atheromatous artery, (5) embolism from a vegetation of aortic valve, and (6) syphilis of aorta closing the mouths of the coronaries.

The commonest cause of all these especially in old people is atherosclerosis with or without thrombosis. One case of each type was observed in the Forensic Medicine Department, of the Andhra Medical College, Visakhapatnam in a series of 26 cases of



CASE REPORT I. Fig. 1. Photograph showing heart and aorta. The aorta shows marked atheromatous ulceration with calcification. Coronaries are occluded. (See p. 403)



CASE REPORT II. Fig. 3. Photograph of the heart showing marked sclerosis of the coronary artery with occlusion. (See p. 403)



CASE REPORT I. Fig. 2. Photograph of the section of the coronary vessel showing calcification with complete occlusion. (See p. 403)



CASE REPORT II. Fig. 4. Photomicrograph illustrates the marked thickening of the coronary blood vessel with calcification (H & E x 40). (See p. 403)



CASE REPORT II. Fig. 5. Photomicrograph illustrates the thrombus inside the coronary vessel occluding the vessel (H & E x 40). (See p. 403)

sudden death during the past 5 years. Their brief histories along with autopsy findings are given below :—

Case reports—CASE I.—J. A. D., an Anglo-Indian, aged 60 said to have suddenly fallen down on 25-9-1951, while leaning on a wall at the work-spot in the Visakhapatnam harbour.

Chief autopsy findings :—The heart weighed 540 g; ascending aorta greatly widened, multiple atheromatous ulcers were seen, and calcific plaques easily detachable, covered the surface of these ulcers. (Fig. 1) The aortic valve was hard and rigid; The anterior descending branch of the coronary artery was calcified and the lumen completely narrowed. The same was confirmed histologically, (Fig. 2). Pulmonary oedema, congestion of liver, atherosclerosis of basilar arteries and benign nephrosclerotic changes were the significant findings at necropsy.

CASE 2.—P.R., male aged 50 was found dead on 30-8-1953 at a fair, 8 miles from Visakhapatnam.

Cardiovascular system :—The heart weighed 480 g., and there was abundant epicardial fat; a well defined zone over the right posterior surface of the ventricle was unusually soft and depressed, (Fig. 3). All the branches of the coronary arteries were hardened, partly calcified and thickened, (Fig. 4). The upper part of the right descending artery contained a thrombus which was also confirmed histologically, (Fig. 5).

In young individuals, the coronaries may be the only vessels affected with the common change being medial calcification, with secondary intimal fibrosis. There seems to be some altered metabolism of calcium and phosphorus.

Pathology.—The common branch affected in coronary artery disease is the anterior descending branch of the left coronary, 2 cm. from its commencement. There may or may not be a thrombus, even a fine probe may be difficult to be passed. If death is sudden, no change may be noticed in the myocardium. Otherwise the myocardial infarct may be produced, and naturally the usual area involved is the anterior part of the interventricular septum, the apex, and the anterior part of the left ventricle. If the right coronary is occluded, the posterior half of the septum with little or no involvement of the ventricle may be noticed. The areas affected are irregular, wedge-shaped, yellowish in colour and surrounded by a red zone.

Microscopic appearance.—Changes in the blood vessels :—Changes in the coronary vessels may take the form of atheroma and intimal fibrosis. The changes in the intima were due to various factors and different views have been expressed on the aetiology of atheroma of the coronaries. Among these, the time-honoured old view of a hypercholestræmia and sub-intimal deposition of cholesterol leading to a raising and thickening of the intima holds good even now. Probably obesity indirectly helps the formation of atheroma. There may or may not be an associated thrombus in these cases.

In cases associated with hypertension there may be rupture of the intimal capillaries due to high intra-capillary pressure and hæmorrhages may be an accompaniment.

Yater *et al* have recently classified the microscopic lesions into three grades 1, 2 and 3, depending on the different changes seen in the walls of the blood vessels.

Changes in the myocardium.—Various changes are noticed from time to time in the myocardium. Within 6 hours, areas of necrosis could be seen followed by polymorphonuclear and macrophage infiltration. By about the 3rd week there is replacement by fibrosis and by the 6th week collagen deposition is marked. By about the 2nd month the infarction has completely healed and is replaced by scar-tissue; and this is why the clinician advises complete bed rest for nearly 6 to 8 weeks.

Effects and sequelae.—Three things can happen if there is occlusion of one of the major branches of the coronary vessels: (1) the patient may die immediately; (2) he may linger for a few hours or days; and (3) in many cases he recovers at least for a time.

Other sequelae of coronary artery disease are:—(1) if the infarction spreads to the endocardial surface, mural thrombosis sets in and if the thrombus gets detached embolic manifestation may be seen in various organs, and fatal results may ensue. This occurs in 50% of cases; (2) pericarditis is seen in 15% of cases; (3) a late sequela is aneurysm of the left ventricle and if the patient survives for some time with the lesion, rupture of the aneurysm may take place with fatal result; this occurs in 8% of cases; (4) spontaneous rupture of the papillary muscles is one of the rare sequelae and the patient dies instantaneously; (5) if the infarction gets infected the abscess formation might result.

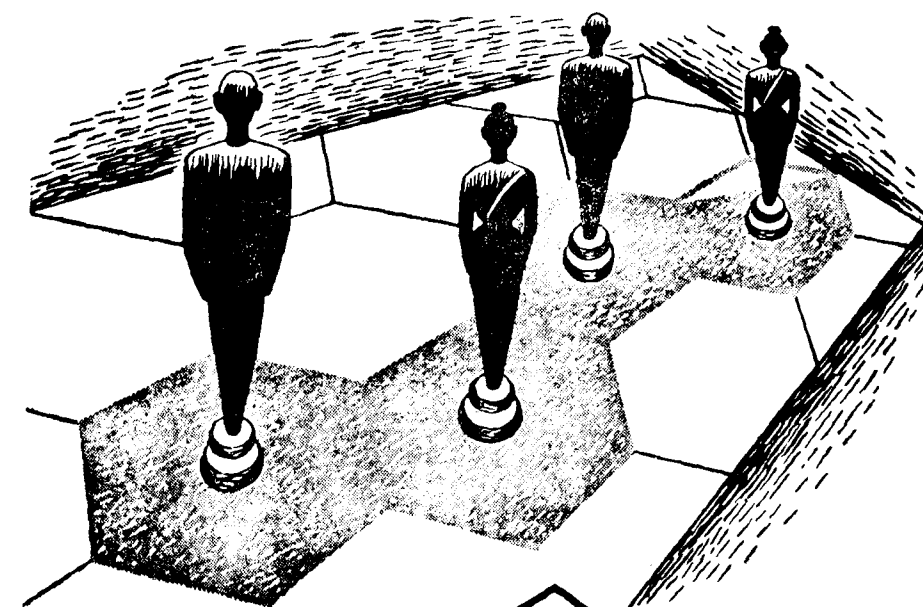
Conclusion.—A bird's eye view of the changes that occur in coronary artery disease with their effects and sequelae is presented. These changes may not be seen if the patient dies immediately. Coronary artery disease may be prevented by observing the following regimen:—(1) Try to be young; (2) avoid smoking; and (3) reduce your weight.

Summary.—1. The pathology of coronary artery disease is briefly discussed. 2. Two necropsy reports are presented one each on atherosclerosis and sclerosis with thrombosis of the coronary artery with suitable microphotographs.

Acknowledgement.—I am very grateful to Dr. D. Govinda Reddy, for his valuable help and to Dr. D. J. Reddy for his helpful suggestions and for according permission to record the cases.

References:

1. Boyd, W. (1933)—Text Book of Pathology, VI Edition.
2. Cassidy, Sir M., (1946)—Lancet, 587-90.
3. French, A. J. and Dock, W. (1944)—Lancet, 122: 12: 3.
4. Froment *et al* (Quoted by Gould in reference 6 *infra*).
5. Goetz, R. H., (1942)—Clinical Proceedings, 1: 190.
6. Gould, S. C., (1953)—Pathology of the Heart.
7. Neumann, N., (1946)—Lancet, 109: Sept. 21.
8. Stewart, H. T. *et al* (1945)—American Heart Journal, 30: 6-641.
9. Yater *et al*, (1948)—Am. Heart Jour., 36-A: 331-372, B: 181-526, and C: 683-722.



ANDRONEX
Synthetic male hormone

ANDRONEX Injectable (Testosterone Propionate)—for intramuscular injection—boxes of 3 x 1 ml. ampoules, 25 mg. per ml.

ANDRONEX Oral (Methyl Testosterone)—tablets for sublingual use—bottles of 20 tablets, 10 mg. per tablet.



ESTRONEX

Synthetic folliculoid female hormone

ESTRONEX Injectable (Estradiol Dipropionate)—for intramuscular injection—boxes of 3 x 1 ml. ampoules, 5 mg. per ml.

ESTRONEX Oral (Ethinyl Estradiol)—tablets for sublingual use—bottles of 20 tablets, .01 mg. per tablet plain, .05 mg. per tablet forte.

LUPRONEX

Synthetic Lutoid female hormone

LUPRONEX Injectable (Progesterone)—for intramuscular injection—boxes of 3 x 1 ml. ampoules, 10 mg. per ml.

LUPRONEX Oral (Ethisterone)—tablets for oral use—bottles of 20 tablets, 5 mg. per tablet.

Full details from: **DUMEX LTD.** Wavell House, Ballard Estate, Bombay-1



for the treatment of indigestion
and allied conditions



DIGENE

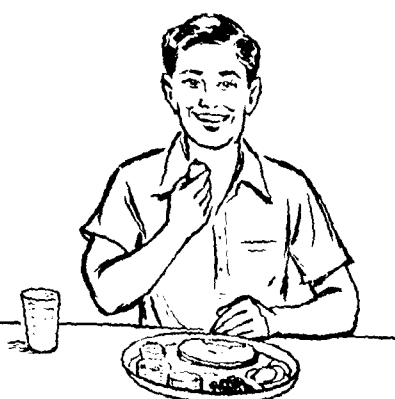
DIGENE is an antacid, adsorbent preparation of magnesium trisilicate with aluminium hydroxide, vegetable bitters and aromatic oils.

INDICATIONS

For the treatment of indigestion, and as an antacid and adsorbent in peptic ulcer (gastric, duodenal and jejunal ulcers), gastric hyperchlorhydria, intestinal toxæmia, and duodenitis. Digene may be taken regularly without risk of causing alkalosis.

FORMULA

Mag. Trisil.	...	...	...	45.5
Alumin. Hydrox.	...	...	...	45.5
Mag. Oxid. Lev.	...	...	...	5.0
Ext. Gent.	...	...	...	0.28
Zingib.	...	...	...	2.0
Calumb.	...	...	...	0.5
Saccharin. Sod.	...	...	...	0.02
Sod. Chlorid.	...	...	...	0.5
Olea Aromat.	...	...	...	0.2



SUPPLIED IN SEALED TINS OF 2 OZ.



BOOTS PURE DRUG CO. (INDIA) LTD.,
POST OFFICE BOX NO. 680,
BOMBAY

The Antiseptic

A Monthly Journal of Medicine and Surgery
Published on the 8th of every month
Founded by the late Dr. U. RAMA RAU in 1904

Editor: U. KRISHNA RAU, M.D., B.S., M.L.A.
Associate Editor: U. VASUDEVA RAU, M.D., B.S.

Editorial & Publishing Office: 323-24, Thambu Chetty St., Madras-1
Annual Subscription: Rs. 7-8-0. Foreign—Rs. 10 Post Paid.

Vol. 52

MAY, 1955

No. 5

BLOOD TRANSFUSIONS

(The Use and Abuse of Blood)

A Review of Current Literature

CONSIDERABLE progress has been made during the last twenty years in simplifying the collection, preservation and administration of blood and there has consequently been a significant increase in the number of transfusions. Transfusions are often given, however, says Dr. Mourant (*Trans. Med. Soc., London*, 69: 22-29, 1953) without sufficient indications and without realising the hazards and dangers that may be involved. 'Many harmful and fatal reactions probably occur which are not traced or attributed to blood transfusion.'

Collection of blood.—Certain new problems have developed as a result of the rapid development of blood banks and the increase in the number of transfusions given. Great care is no doubt taken in the selection of donors, and suitable screening methods are also used, to detect diseases like syphilis, malaria, tuberculosis or hepatitis. The transmission of most diseases is much less likely to occur with the present methods of donor selection. Turner and Discker of Johns Hopkins Hospital found that *Treponema pallidum* is destroyed, if blood is stored at refrigerator temperature for 96 hours. "Quarantine for this period of the blood is obligatory if the donor is not given a complete physical examination." Hutton and Shute showed so long ago as 1939 that malaria can be transmitted by blood transfusion and plasmodia have been known to appear in the patient's blood, years after an attack of malaria. The parasite survives in stored blood even under refrigeration. A serious problem in transfusion therapy is the prevention of heavy bacterial contamination, for it has been recorded that some 2 to 5 per cent of blood-bank donations may be so contaminated. Most

[405]

organisms do not multiply readily at refrigerator temperature, but their end-products may set up a pyrogen reaction (*J. Lab. Clin. Med.*, pp. 902-916, 1952). Dr. Peter Vogel, Director of the Blood Bank and Hematologist, New York Department of Health, recommends that when sedimented red cells are used, the plasma should be removed just before the administration, in order to prevent the growth of bacteria which may be introduced by the procedure (*Bull. N. Y. Acad. Med.*, Sep. 1954). "Certain gram-negative chromogenic bacteria which grow readily at 4°C have caused fatal transfusion reactions," according to Borden and Hall (*New Eng. J. Med.*, 245: 1951).

In view of the fact that the handling of blood at various stages all along the line from the drawing to transfusion is largely in the hands of skilled technicians and nurses, supervised of course by doctors, it is difficult to say who is responsible for over-coming the errors. At the final stage, however, the responsibility must be borne by the physician who makes or orders the transfusion but in fact there is very little of the process over which he has any control at all. "Blood is a potentially lethal commodity," says Dr. Donald T. Hall of Seattle, Washington, "a fact which, I feel sure, is not sufficiently appreciated by many of those who process, handle or use it." This, to our mind, is perhaps a slight overstatement but in view of the great risks involved in wrong or defective techniques, such warning is to be welcomed.

Preservation of blood.—As a result of sustained efforts by the American National Research Council and the British Medical Research Council, effective acid glucose-citrate mixtures are now in use for the proper preservation of red cells. "About 90 per cent of transfused red cells have a normal survival in the patient, if the blood has not been stored for more than 14 days. But after 21 days of storage, about 30 per cent of the transfused red cells do not survive for more than 24 hours in the recipient. Recent improved processes using glycerin for dehydration and storage below zero-degree C, enable the preservation of red cells for months or even years (*Lancet*, 1: 215-218, 1953). The cells are rewarmed and the glycerin is removed before use." This, we believe, is still in the experimental stage.

Blood-grouping and Rh typing have also progressed apace, during the last 10 years. Cell-grouping has to be confirmed by means of a serum-typing for both donor and recipient. All individuals found negative by the usual methods for Rh typing should be rechecked by the more sensitive antiglobulin technique, for weakly reacting Rh positive blood may immunize Rh negative recipients. And also if a weakly positive blood is transfused to an Rh-negative recipient who is already immunized to Rh antibodies a fatal hæmolytic transfusion may result. Dr. Peter Vogel advocates "the use of the indirect anti-globulin test as the most reliable

method to prevent serious transfusion reactions, resulting from the usual routine saline matching. It is wrong to assume that simple direct matching is enough when only homologous blood, both group and Rh, is used for transfusion. From clinical experience it is known that patients with blood dyscrasias, particularly hæmolytic anaemia, lymphoma, cancer and lupus erythematosus, who require frequent and repeated transfusions are more prone to immunization to some of the less antigenic blood group factors. Further, in recipients strongly immunized to one blood-factor, multiple anti-bodies to other blood factors frequently develop after further transfusions."

Errors in typing of the major groups are serious and may often lead to disastrous results while those in the minor group are less severe but always troublesome and even alarming at times. We have now at least a dozen different systems of blood group antigenic substances of which only two—ABC and CDE (Rh)—are of real importance. These blood group systems are named for the specific antigens (Agglutinogens) present in the red cells. Antibodies—antibodies (Agglutinins)—are present in the serum. In spite of the facts that isoagglutinins—present in the serum. In spite of the facts that blood banks nearly always now cross-match both the major and minor groups in both the ABC and Rh groups, hæmolytic reactions do occur from agglutinations of the lesser antibodies, not routinely determined in the present cross-matching procedures. (*N. W. Med.*, Sept. 1954).

Objectives of transfusion.—In the use of transfusions, the primary objective is maintenance or restoration of the blood-volume after hæmorrhage, severe trauma or burns. At the time of surgery the only accurate way of estimating blood-loss is simply by measuring the amount of blood on surgical sponges and in the suction bottle. "The help and advice of the anaesthetist is valuable not only in so far as total blood volume is concerned, but also as to adequacy of oxygen transport. Such assistance relieves the surgeon of much responsibility in this important phase of major surgery."

The second most important use of blood is to increase the oxygen-carrying capacity by providing an increased number of red blood cells. In chronic anæmias, severity of the anæmia itself is not necessarily an indication for having recourse to transfusion. Transfusions are indicated basically *only* when iron and liver are not effective, when there is excessive weakness, orthopnoea, cyanosis or angina; where surgery is immediately necessary; or where there is severe œdema from decreased plasma-proteins.

Another important use of blood is in the provision of protein nutrients in cases restricted to parenteral feeding. The use of whole blood, although it contains three or four times as much utilizable protein as plasma or albumin solutions, is not satisfactory as a nutritional source. Expansion of the patient's blood volume

by the cellular fraction is greater and more prolonged than that produced by soluble proteins.

Blood is also used for the removal of blood possessing pathogenic properties, replacing it with normal blood, as in exsanguino-transfusions resorted to in the treatment of neonatal erythroblastosis.

Substitutes for blood.—There is no true substitute for whole blood. It is the most effective substance to combat shock due to hæmorrhage. If whole blood is not readily available, certain substances may be and are used in an emergency. A number of these substitutes are now commercially available and are called plasma volume expanders or extenders. Numerous investigators have reported the advantage or efficacy of one product over another, but not one of the expanders has entirely fulfilled the theoretical requirements. (*J.A.M.A.*, 152: 1116-20, 1953). "The accumulated evidence is not in favour of these substitutes. Globin derived from red cells has some promise as a blood expander, although the material in its present form is still not suitable for use. Albumin, a blood derivative which does not transmit the virus of hepatitis, could be used effectively as a plasma expander, if sufficient supplies were available."

Modified protein such as gelatin oxypolygelatin, and polyvinylpyrrolidone (PVP), have been used for sometime, but their effectiveness in shock due to hæmorrhage has not been convincing.

Dextran has been given the widest trial in nearly all countries of the world. (*J.A.M.A.*, 153: 24-26, 1953). The high percentage of allergic reactions would limit the widespread use of this product. The single advantage that all these expanders have over plasma is that they do not transmit the virus of hepatitis. Dr. Peter Vogel considers that until more experience is gained, it would be wiser to limit the amount of these substitutes to 200 cc. or less.

The use of red cells to combat anæmia and as a source of protein has recently been suggested. (*J.A.M.A.*, 152: 777-81, 1953). This method may require large volumes to elevate the total protein and the hazard of circulatory overloading must be remembered in this connexion.

Need for special care in ordering transfusions.—The routine use of blood for all cases and in the quantities currently used, in considered by experienced surgeons and physicians to be unnecessary and perhaps in some cases also undesirable. Hall cites as example "the routine ordering of 4 to 5 units for a radical mastectomy and 5 to 6 units for routine thoracoplasty!" and states that "blood is also given all too frequently as the doctor feels that it will act as a tonic or to cover poor surgical technique!" Circulatory overload will result in cardiac failure particularly in the older patients.

The dangers involved.—In the U.S.A. where over four million units of blood are used every year, a fatality rate for transfusion-

has been reported varying from 0.5 to 1.5 cases per 1000 transfusions and the rate of reactions is stated to run up to almost 45 per cent (*N.W. Med.*, Sep. '54).

As stated already, the transmission of disease, such as syphilis, malaria, tuberculosis and hepatitis is a potential threat. Gas embolism has been reported from air-pressure transfusions which were not made with due care. The two major risks of prime importance, are the hæmolytic reactions and circulatory overload. There is also the potential risk of immunizing the patient to one or more of the blood group antigens, reference to which has been made earlier in this review. The hæmolytic reactions may be of varying severity, and include lumbar pain, restlessness, chills and fever (usually caused by pyrogens) nausea and vomiting, precordial pain or shock. Jaundice and oliguria may appear later. Reactions are liable to be masked when they occur while the patient is under anæsthesia and for this reason, transfusions during operations carry additional risk. As many of the reactions usually appear within about five to ten minutes of starting the transfusions, it is wise to keep a watch, stop transfusing immediately any reaction is observed, and ascertain if possible the cause for the reaction, e.g., gross mismatching, in which case a recross-matching should be promptly made. The condition must be combated vigorously during the first few hours; shock must be treated early by the use of plasma or of compatible whole blood. Successful results have been reported from total blood replacements during the early phases. When transmissions are made with due care and circumspection, scrupulously avoiding incompatibilities, the only other risk is that of circulatory overload. "Patients in the older age groups carry an appreciable degree of pulmonary hypertension, with an added chronic anæmic condition. Added blood given during immediately after a surgical operation may participate acute right heart failure. This is also likely to happen in cases undergoing surgery of the lung. Persons suffering from long standing illnesses, usually show myocardial degeneration, and carry a low hæmatocrit." Transfusions invariably produce severe reactions on such people. Dr. Hall reports that at *post-mortem* their lungs were found to be very wet and œdematous and their right auricles very much dilated. He therefore considers that many such cases should be listed as transfusion deaths.

Transfusion of packed red cells.—In treating cases of severe long standing anæmias, Hall prefers packed red cells to whole blood. The giving of plasma expanders to patients with a hæmatocrit of 20 or below is considered a very dangerous procedure. The giving of whole blood as a tonic is to be strongly deprecated, for transfusion depresses bone marrow activities, and causes an appreciable fall in the reticulocyte response. "Exogenous hæmochromatosis has lately been noted rather frequently with multiple transfusions. As the system lacks power for eliminating the excess iron, in a number

of patients with chronic aplastic anaemia, chronic haemolytic anaemia and Cooley's anaemia, who usually receive frequent transfusions over a prolonged period of one or more years, iron is deposited in the tissues; this overload results in pathological changes in the liver and pancreas and cause the above syndrome (*Blood* 3: 617-610, 1948).

From a careful study of this review, it will be readily apparent that blood transfusions, which are life-saving when properly and judiciously used, can produce serious and severe reactions and even fatal results when abused.

Gleanings From The Medical Press

OBSTETRICS AND GYNAECOLOGY

Normal labour including anaesthesia and analgesia The place of forceps in present day obstetrics — (*Brit. M.J.*, 951-955, Oct. 31, 1953, via *Gly. Surg. Obst. Gynaecology*, June '54).

The revolution in obstetric practice which has come about in the last 25 years, among other things has modified views on the importance of forceps. The introduction of the lower segment caesarean section operation; the discovery of sulphonamides and antibiotics; the provision of facilities for immediate and full replacement of blood loss; the extension of antenatal supervision; and the upgrading of maternity hospitals and their staffs are some of the more important factors concerned in this revolution. The result has been a dramatic fall in the maternal and foetal mortality rates. In some respects, the benefits of modern trends are better illustrated by foetal results.

In the Liverpool Maternity Hospital, which handles a selected group involving a high proportion of abnormal cases, 50,622 babies were born during the 25 years between 1926 and 1950. During this period the stillbirth rate was reduced by two thirds and the neonatal death by one third, and, at the end, birth injury was responsible for less than 10 per cent of deaths. Also during that time, the forceps delivery rate rose from 6-7 per cent to 16-17 per cent—at the expense of spontaneous delivery, not of caesarean section.

The increased number of forceps deliveries were accompanied by a fall from 20 per cent to 2 per cent in the foetal mortality for the operation. This was explained by factors such as substitution of skill for force, insistence on an accurate cephalic application of the blades, the avoidance of difficult mid-forceps deliveries, and by carrying out the operation earlier, in the second stage of labour. Once it is clear that birth is impeded, maternal and foetal distress should be anticipated and the forceps delivery leisurely carried out as a planned operation.

Among the last 3,522 forceps deliveries, there were 6 maternal deaths for which the operation was partly responsible. In 3 of these, the fatal outcome was the result of inhalation asphyxia associated with anaesthesia, and the anaesthetic may have played a part in the fourth. The chief danger of forceps delivery in modern practice is general anaesthesia.

A prophylactic forceps operation has an important place in the fully equipped maternity hospital, but it should be avoided in domiciliary practice where facilities are limited. Under the latter circumstances, only low forceps delivery should ever be attempted and then with a clear indication. In hospital, caesarean section is preferable to many of the difficult mid forceps deliveries. It is not always easy, however, to decide which delivery is going to be difficult, and even the expert can make an error in judgement. When such an

error is made, it is essential to recognize it early and to stop further efforts at delivery, resorting instead to caesarean section before either mother or baby is injured. Indeed, in hospital practice there may be a place for a "trial of forceps"—a procedure suggested by Frank as early as 1908.

Natural child-birth is not necessarily benign for the individual mother or

child, and judicious interference with nature can produce better results. As the methods of such interference become safer, their role must be constantly reviewed. The place for the forceps operation is not static but varies constantly, according to the relative safety of caesarean section on the one hand, and spontaneous delivery on the other.—*Author's Abstract.*

REVIEWS OF BOOKS AND PERIODICALS

Legal Medicine—Edited By R. B. H. GRADWOHL, M.D., Sc.D., M.C., U.S.N.R. (Retd.). 1954. pp. 1160 with 222 illustrations. Published by M/s. C. V. Mosby Co., St. Louis.

Legal Medicine today is a very important and highly diversified subject and extends beyond mere Pathology, Anatomy, and Toxicology. Dr. Gradwohl, Director of the Police Laboratory, Metropolitan Police Dept. of St. Louis and First President of the American Academy of Forensic Sciences, is the Editor of an exhaustive up-to-date Textbook on Legal Medicine covering over 1100 pages. Selecting a group of first-rate authors who were each competent to record their views and experiences on the different branches comprising Legal Medicine, Dr. Gradwohl has successfully brought out an excellent work comprising 39 chapters, in which 29 eminent professional men have participated. Quite appropriately Sir Sydney Smith, the Nestor of Legal Medicine in Great Britain, Dean of the Faculty of Medicine and Professor of Forensic Medicine in the Edinburgh University writes the first chapter with an illuminating and eminently readable account of the history and development of Forensic Medicine in different countries of the World from 3000 B.C. to the present day. Three other well-known medical men of England, Dr. Camps of the London Hospital, Dr. Evans of the Charing Cross Hospital and Dr. Jones of the Royal Sussex County Hospital, have made important contributions to the book. The discussion on the common causes of unexpected deaths by Dr. Jones is one of the most valuable chapters in the book. Dr. Camps covers the entire field relating to wounds of the head and body

and their interpretation in forensic medicine. Dr. Scott, Dental Surgeon of the U.S. Public Health Service furnishes the latest views and opinions on the value of Dental Science in identification and in Criminology. Identification by means of bite marks on eatables and tissues and age-determination by means of teeth furnish very interesting reading. Dr. Gradwohl himself is responsible for four important chapters in the book which relate respectively to "Blood-identification", "the principles of non-paternity by blood-tests," "the examination of the seminal fluid" and "Infanticide." He gives a very vivid description of the blood tests, blood matching and cross matching used in blood donations and transfusions and discusses the Rh grouping and other factors in the determination of paternity. In another chapter he describes the new test for seminal fluid, introduced into legal medicine in January 1950, by Mr. J. T. Walker, Chemist, Massachusetts, Department of Public Safety, Harvard Medical School which Mr. Gradwohl has himself used with considerable success, in police investigations. The test is a simplified method of recognizing acid phosphatase activity in seminal stains based on a histochemical technique described earlier in 1949 by Seligman and Mannesimer.

The chapter on Toxicology covers over 120 pages of the book and is thoroughly exhaustive dealing with the most up-to-date methods of assays and determinations. Microscopic—crystallographic procedures for the identification of unknown substances offer, according to Mr. Eizenburg, Chief of the U.S. Food and Drug Administration at Washington, a rapid direct and vivid substitute

for the ordinary analytical methods and the descriptions given by him in chapter 25 are very interesting. Recent advances in the treatment of poisoning form the subject matter of Chapter 12 in which Dr. Freireich of New York University devotes considerable attention to various antidotes, chief among which is BAL. Medico-legal problems involved in the various systems of workmen's compensation in vogue, are discussed fully in Chapter 27. In Chapter 29 Dr. Gradwohl deals with "Infanticide" from the point of view of the twentieth century culture and civilization and compares the American laws with the English and German laws on the subject. The law relating to abortion varies widely in the different states of America as set forth in Chapter 30 by Dr. Regan. Chapter 31 on Forensic psychiatry covers nearly 70 pages and deals at considerable length with all the aspects relating to the origin and evolution of civil and criminal laws, the rules governing evidence, the rights of individuals, and to the resolution of the chronic struggle of man against man. Dr. Matthews, an experienced anaesthesiologist of Minneapolis, writes in Chapter 33 on narcoanalysis for criminal investigation and its value and use as a deception test. He considers it a valuable technique which has profoundly affected both the innocent and the guilty and has thereby hastened the cause of justice when it was administered extrajudicially with the consent of the accused. This chapter deserves to be read by lawyers and doctors alike. The lie-detection apparatus is a recent innovation and its working, applications and limitations have been elaborately discussed in Chapter 34 by Dr. Lyle, a specialist in this branch of criminology.

We have no hesitation in commending this excellent book to the notice of medical and law students, members of the medical and legal professions, jurists, Law Information Officers, Pathologists and Toxicologists, who will all find accurate and encyclopaedic information on all subjects relating to forensic medicine, toxicology and medical jurisprudence in its thousand and odd pages of beautiful print. Dr. Gradwohl's observations in the concluding chapter

on official medico-legal investigations deserve special mention.

"Legal pathology is a speciality of general pathology. Hospital pathologists, as a rule, are not properly qualified in legal work and unless this fact is recognised, we shall continue to witness deplorable blunders and highly varied conclusions will be presented to the Judge and the Jury. This treatment may arouse bitter opposition but I make it freely and calmly, basing my opinion on many years of experience, study and observation."

T.N.S.R.

Clinical Bacteriology—By E. JOAN STOKES, M.B., B.S., M.R.C.P., M.R.C.S., Clinical Bacteriologist, University College Hospital, London. Pp. 228. Published by Edward Arnold (Publishers) Ltd., London. (Agents: M. S. Orient Longmans Ltd., 36-A, Mount Road, Madras-2). Prices 20s. net.

Examination of bacteriological specimens is gaining greater and greater importance now-a-days. The diagnosis, to a very great extent depends on the judgement of the person who works in the laboratory. This book enables the worker to come to correct conclusions in these procedures. The first chapter is on general procedure and discusses records and reports in connexion with bacteriological examinations. The next chapter is on the culture of specimens normally sterile and includes blood, cerebrospinal fluids, serous fluids, urine and pus. The next chapter discusses the examination of specimens from sites like the throat, the nose etc. with a normal flora. Identification of bacteria is an important chapter and is well described. There is a chapter on clinical immunology, which is bound to be very useful. The chapter on hospital epidemiology is a subject of importance, when one considers the possibility of ward infection because of a breakdown in aseptic techniques; the need of proper sterilization; food poisoning etc. and the control of these difficulties. All the methods described in this book are well known methods. We are sure the book will be very useful to pathologists and clinicians.

U.K.R.

*Used with
excellent results*

Strength Grows
with
'V I T M O L'
Compound
Proven Tonic
and expectorant

Stimulating and alterative tonics frequently are indicated in loss of weight and vitality; in anorexia, anaemia, and impaired digestion. This is particularly true after debilitating fevers such as malaria and dysenteries, in malnutrition and neurasthenia, and following infections of the respiratory tract.

For utmost patient acceptability such tonics must be as palatable as possible and maintain therapeutic effect.

In order to provide a pleasant-tasting, highly-nutritive stimulating tonic, the Medical Research Division of Sharp & Dohme has prepared VITMOL COMPOUND.

Suggested dosage:

Adults: 1 or 2 dessertspoonfuls

Children: 1 or 2 teaspoonfuls

The dose should be taken before each meal and on retiring (4 times daily).

Rx. VITMOL COMPOUND in 14 oz. bottles.

Sole distributors:

V O L T A S L I M I T E D

Successors to the Engineering & Import division of Volkart Brothers.

Bombay · Calcutta · Madras · Cochin · New Delhi · Kanpur
Scientific Literature from Bombay Post Box 900

Spermatorrhoea

**SEXUAL SEDATIVE &
DECONGESTIVE AGENT**

SPERMAN

COMPOSITION

Suvarnavang
Combined with extracts of Salep misri (Orchis mascula) Chharila (Parmelia parvata) Kahu (Lactuca scariola) Gokhru (Tribulus terrestris) Talamakhana (Hygrophila spinosa) Kavach (Mucuna pruriens) Vriddha-dharaka (Argyrea speciosa)

DOSAGE: Two tablets twice a day with milk.
PACKING: 50, 100, 500 & 1000 tablets.

"I have used it on forty carefully observed cases and on the whole the results have been very encouraging. I am interested in these cases as there was no medicine for this disease. I can say that the drug is very effective. The drug is particularly useful in removing the nervous symptoms and neurasthenia etc. Judging from the results of the present investigation the response to treatment with Sperman is very satisfactory and it has a definite place in the treatment of cases of spermatorrhoea."

K. C. Sahu, M.B., B.S. (Pat.), D.P.H. (Eng.), D.C.H.
(R.C.P. & S.) D.T.M. & H. (L'pool), F.D.S. (Lond.).

Medical Digest, Vol. 22, No. 9, Sept. 1954

Sperman has recently been found most effective in relieving the obstructive symptoms due to enlargement of the prostate.
from THE HIMALAYA DRUG CO., makers of 'SERPINA' Sold in 5 Continents.
251, Hornby Road, Bombay 1.

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

Antiphlozone Poultice

PRESCRIBED BY EMINENT
PHYSICIANS AND USED BY
HOSPITALS SINCE 1931



**WHEN CONSTANT
MOIST HEAT IS
REQUIRED**

1. To subside inflammations and stop PAIN.
2. To relieve SWELLINGS by increasing flow of blood.
3. To localize infections.

ANTIPHLOZONE POULTICE MAY BE USED AS
ADJUVANT IN CHEMO-THERAPY

Trial size (4½ oz.), Rs. 11-8 per doz.
No. 1 also (10½ oz.), Rs. 21/- " "

Postage Extra

Hospital size (5 lbs.) also available
NO FREE SAMPLE

Manufacturers:

THE ZONE CHEMICAL Co.,
BOMBAY-4

LIVAFOLBIN

Two c.c. contains:

Liver Extract	... 50 gm.
Folic Acid	... 7.5 mg.
Vitamin B12	... 25 mcg.

Indicated in:

Acute pernicious anemia, Macrocytic Anemias, Sprue.

Subnormal growth in children is reported to respond to Vitamin B12. Increased appetite were noted in the patients treated and also for the functioning of bone marrow.

Dosage: To be injected intramuscularly 2 cc. daily or alternate days as directed by the physician.

Packing: 2 c.c. amps and 10 c.c. & 50 c.c. R.O. phial

CALCIDOX

(Calcium Gluconate with Vitamin C)

Five c. c. contains:	Ten c. c. contains:
Calcium Gluconate 10%	10%
Vitamin C	100 mg. 300 mg.

Indicated in:

Pregnancy, lactation, periods of rapid growth, febrile conditions, old age convalescence and debility states, in Haemorrhagic & development of teeth and bones.

1 ampoule to be injected daily or alternate days intramuscularly or intravenously as directed by the physician.

MANDOSS DRUGS LTD.

221/2, Strand Bank Road, CALCUTTA-1.

C. B-Complex

Elixir of Proteolysed whole Liver
Extract with Digestive Enzymes and
Vitamins of B Complex and C.
Cum Hypo Phosphites and Tonic
Elements.

COMPOSITION:

Each fluid ounce of C. B-Complex Elixir contains:

Proteolysed whole Liver Extract	1 Fl. dr.
Vitamin B1	10 mg.
Vitamin B2	2 mg.
Vitamin B6	25 mg.
Nicotinic Acid	75 mg.
Vitamin C	4 grs.
Calcium Hypo Phospite	1 gr.
Ferrous Gluconate	0.3 mg.
Strychrine HCl	20 mms.
Glycerinum Papaini	Q.S.
Syrup	
Alcohol content	8% v/v of absolute alcohol

PRESCRIBED BY THE MEDICAL
PROFESSION EVERYWHERE

For further particulars please write to:

**SREEVATSA CHEMICALS
& DRUGS LIMITED,**
166/169, Nyniappa Nalok St.,
MADRAS-3

ALETROL

A UTERINE TONIC AND SEDATIVE

Each fluid ounce contains:-

Calcium Lactate	... 15 Grs.
Potassium Bromide	... 15 "
Ext. Aletrol Liq.	... 10 m.
Ext. Ashoka Liq.	... 15 "
Ext. Lodhra Liq.	... 15 "
Ext. Ashwagandha Liq.	... 10 "
Ext. Shatavari Liq.	... 15 "
Ext. Pisoid Liq.	... 15 "
Ext. Hydrast Liq. B.P.C.	... 5 "
Drakshasava	... 2 Dr.
Syrup	... Q. S.
Alcohol	5% V/V.

ALETROL is a combination of sedatives uterine tonics, and nutrients useful in the treatment of the common disorders of female reproductive system especially of uterus.

INDICATIONS: Irregular menstruation and other menstrual disorders like menorrhagia, dysmenorrhoea, inflammation of the uterus, threatened abortion, premature delivery, leucorrhoea, salpingitis and salpingoovariitis.

Dose: 1 to 2 teaspoonfuls three times a day.
PACKINGS: 4 oz. and 1 lb.

INDOCO REMEDIES LTD.,

457, Sardar Vallabhbhai Patel Road, BOMBAY 4.

ARSENO- TYPHOID for FILARIA

CALCUTTA CLINICAL RESEARCH, H.O. & Laboratory: 6, Chowringhee, CALCUTTA-13

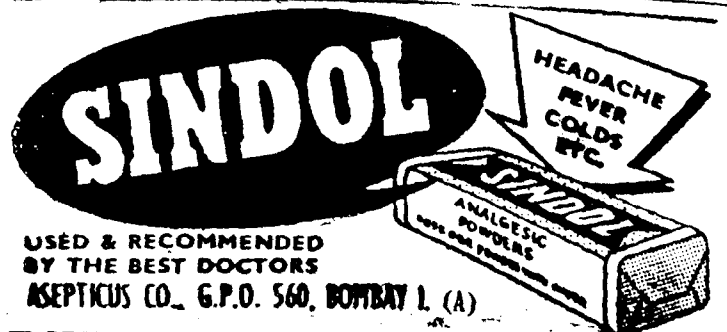
FOR
ELEPHANTOID LEGS, HANDS,
FILARIAL SCROTUM, WEEPING
BREASTS AND EVERY FORM
OF FILARIASIS

Particulars free from:

SALES OFFICE:

10, Rawdon St., CALCUTTA-16.

H.O. & Laboratory: 6, Chowringhee, CALCUTTA-13



USED & RECOMMENDED
BY THE BEST DOCTORS
ASEPTICUS CO., G.P.O. 560, BOMBAY 1 (A)

RELIEVES PAINS & ACHES

LIQ.
SICCANS
INJECTION TREATMENT
FOR
HYDROCELE

Used by the best
Doctors for over
25 years

Write for
complete literature
ASEPTICUS CO.

"Health" PROTOZIDE PROVIDES

Chloro-iodo-oxyquinoline to
act on intestinal protozoa.

Phthalyl Sulphacetamide to
act on intestinal bacteria.

Vitamin B Complex to re-
move the intestinal atony and
other symptoms attributed to
sulphonamide treatment

Indicated in prophylaxis and
in the treatment of intestinal
amœbiasis—acute or chronic,
bacillary dysenteries, ulcerative
colitis.

INDIAN HEALTH INSTITUTE
& LABORATORY LTD.
DUM DUM CANTY. (WEST BENGAL)
Madras Depot: 4/149 Broadway, Madras 1

For Rheumatism & Arthritis
TABLET
RHEUMOPHAN COMPOUND
(Gold Bhasma with Mahayograj
Guggal & Maharasnadi Quath)
Packings: 60, 120, 500 Tablets

For Mental Disorders
TABLET
SILEDIN
(Brahmi, Chandrika, Uragandha,
Shankhaval, Jeevanti, Bhrungraja)
Packings: 50, 100, 500 Tablets

Literatures from:
ALARSIN PHARMACEUTICALS
(INDIA)
Post Box 14,
BOMBAY-1

SULFOMIN

(Phenyl methyl amine-p-amino-
benzenesulphonate)

for LEPROSY

A sulfo-drug of proved efficiency
without any side reactions of
general sulphono preparations

Sold in 2 cc. Injectules of 0.05 gm.
in boxes of 6, 12 & 50 ampoules

ALKALOID RESEARCH
LABORATORIES LTD.,

47, Harish Chatterjee St.,
CALCUTTA-26



ATHOMIN

A drug which clinically produces
sympathomimetic and Antibacterial
action

ATHOMIN—has clinically proved curative
in Cholera, Obstinate Children's Diar-
rhoea, Non-specific Diarrhoea, Bacillary
Dysentery, Colitis, Severe Food Poison-
ing etc.

ATHOMIN—due to its sympathomimetic
action, stimulates the sympathetic
system, stops effortless vomiting,
arrests salt depletion, reduces hæmo-
concentration, improves the pulse in
collapse condition and in furtherance of
its action on the adrenergic nerves,
ATHOMIN quickens some of the impor-
tant organs which once again consider-
ably revive their actions. The anti-
bacterial action (1:40,000) of ATHOMIN
makes the stool microbes free within a
short time.

(Presented in Tablets and Injections).

For further information, Please contact:

AEON CHEMICAL INDUSTRIES LTD.,
55, Canning Street, Calcutta-1.

"I like these 'Pyrex' beakers because..."

"they are so much stronger, and last so much
longer."

"How is that?"

"Well you see, Sir, because of their low co-
efficient of expansion, they can be made of much
thicker glass. Wafer-thin beakers are so easily
broken that we save pounds a year in the lab.
by using 'PYREX'!"

Yes indeed! "PYREX" borosilicate glass beakers
and flasks are robust and shock-resisting. Heat
and acid-resisting too. Coefficient of expansion
3.2 x 10⁻⁶ . . . almost nothing.

"PYREX" brand laboratory glassware
is made only by James A. Jobling & Co. Ltd., Sunderland
Large new catalogue FREE
Send name, address and position in firm



JAMES A. JOBLING & CO LTD
Wear Glass Works Sunderland
England

The only makers of 'Pyrex' Brand glass in the United Kingdom

For CHOLERA

There is

CHOLRAGON

Tested in hundreds of Cholera cases with success, is valuable for diarrhoea and allied stomach complaints. The following is one of our many testimonials.

We treated hundreds of cases with this wonderful remedy for the last 10 years and we are pleased to say we have been successful in every case.

MOTHER AIMIE. Re: Convent, Dacca
Apply Dept. A

PIXIE PRODUCTS,
27, CAMAC STREET, CALCUTTA-16

LEUCODERMA

Int. & Ext. medicines Rs. 8-4-0.

Dr. B. Gopal Rao, B.Sc., M.B.,

Bangalore:—"Used in cases of Leuco-
derma and found very efficacious."**LEPROSY**

45 days' Int. & Ext. medicines Rs. 12-8

Dr. M. Mohabay, Gandhi, C. P.:—

"Work marvellously for Leprosy."

V.P. and other charges extra.

BEHAR CHEMICAL WORKS, BHAGALPUR.

KARUR

Pandit P. S. RAMA SARMA'S

"SAKTHI SANJEEVI"

(Ayurvedic Product)

Best Treatment & also Preventive for Children's

Liver & Spleen Disorders

Effective Products for

CHILDREN'S WHOOPING COUGH & TONSILS

are also available with us.

SREE SAKTHIVILASA VAIDYASALA,

KARUR, TIRUCHI DT. (S. India)

**FOR DISPOSAL AGAINST
REASONABLE OFFERS****'CURITY' Plaster of Paris Bandages**

3"x3 yds.; 4"x5 yds.; 6"x5 yds. (U.S.A. make)

'GOODRICH' Rubber Catheters

Sizes 8 to 24 (U.S.A. make)

WRITE OR CALL AT

THE IMPEX AGENCY,

89, Princes St., BOMBAY-2

Vereinigte Chininfabriken

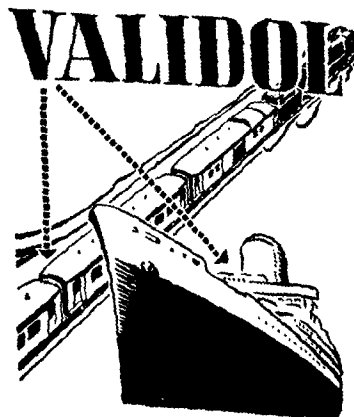
ZIMMER & CO., G.m.b.H.

Mannheim-Waldhof (Germany)

Presents one of their
Outstanding Preparations:

Nervous irritation
and exhaustion,
Travel sickness,
Palpitation, spasms,
Cardiac and gastric
neuroses.

Prompt relief with



Sole Importers & Exclusive Distributors

PANNALAL BROS.,

44/45, Ezra St., CALCUTTA-1

Phone: 33-6527

Gram: 'PRONTOSIL'

The Ideal Remedy
for all Degrees of Acute or Chronic Cardiac Insufficiency

PANDIGAL

It contains the pure crystalline glycosides - the lanatosides A + B + C isolated from the leaves of the Digitalis lanata - which produce the complete classical digitalis effect. Pandigal has the following outstanding properties:

- Splendid compatibility
- Easy resorptiveness
- Non-toxic, good therapeutic cumulation
- Ready and exact regulation of dosage

DROPS - AMPOULES - TABLETS

P. BEIERSDORF & CO. A.-G. HAMBURG
For India: PARRY & CO. LTD. Madras · Calcutta · Bombay · New Delhi

A-Po 86

'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 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 1102, BOMBAY-1

A WELL BALANCED SYRUP

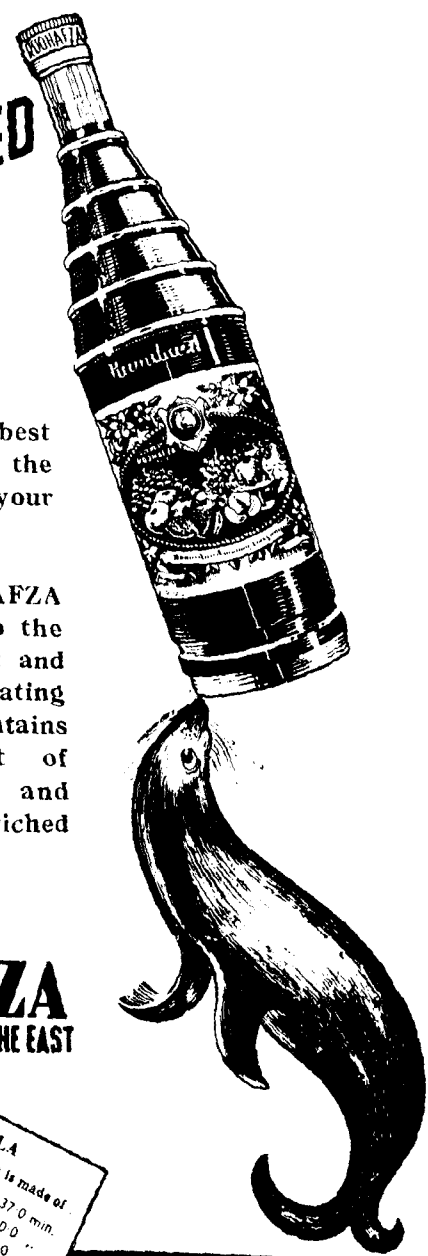
ROOHAFZA is the best balanced syrup in the market. It regulates your system.

Each glass of ROOHAFZA brings 150 calories to the body, relieving thirst and fatigue and reinvigorating the system. It contains fruit juices, extract of Herbs, Vegetables and Flowers and is enriched with Vitamin C.

ROOHAFZA
THE SUMMER TONIC OF THE EAST

FORMULA
Each dose of Roohafza is made of:
Distilled Rooh Afza 37.0 min.
Dist. ext. of citrus flower 7.0 "
Orange extract of Rose 7.0 "
Vitamin C 30 drms.
Citric acid 2.5 gr.
Sugar 1.7 oz.
DOSAGE: 3 Table spoonfuls (2 oz) 2 times a day.
Calorific Value: Each dose of Rooh Afza provides about 150 large calories of energy.

Hamdard
DAWAKHANA (TRUST) DELHI



WRITE FOR OUR BONUS SCHEME

GUARANTEE: RELIABLE GOODS—VERY PROMPT DELIVERY
FREE: 25% and 50% postage free on Rs. 250 & Rs. 500 parcel order respectively.

PRESENTATION ARTICLE free for an order of Rs. 75/- and above. Packing free for Post Parcel Order.

Aureomycin Spersoids 6-0	Liver Extract 10cc 2 U.	1-14	Combiotic 1/2 gr. 3-6	1 gr. 4-4
Atophanyl 1M or 1V Eng. 5A 4-2	" with Vit B & C 10cc TCF 3-6		Calc Osteolin 15cc 3-3	6A 3-0
Penicillin G Cryst. 2	" 5USP 2-2; 10 USP 2-8		Menstrone CDC 25tab	2-12
0-6-9 0-9-9 0-15-0 Glaxo	Liver Ext. fort. Vit. B 20M; 10c		Voice Tab 100 1-0	1000 6-0
0-9-6 0-15-6 1-6-0 Pfizer	2U 2-10; 5U 2-14	10U 3-4	Uroxy 4oz CDC 2-11	Vidylin 3oz 4-10
0-7-6 0-10-9 1-1-0 Squibb	Normal Saline 100A	5cc 3-4	Ureasulphazide 12x5cc	7-12
" Procain 20 Iac Glaxo 1-11-6	Santonine M&B 4-0,	oz. 29-8	Lacarnol	5x1cc 4-4
4 Iac Pfizer 0-13-9 Rhodia 0-9-0	Redoxon 2cc 5-2-6;	50 19-4	Hypo Syringes naked each in box	2 5 10 20 50cc.
" Alac Gl. 0-9-3 Ita. 0-7-9 Sqb. 0-10-9	" 5x5cc 4-0; 25x5cc 18-4		A.G. Jap. Sup 0-9 0-15 1-2 1-4 3-4	
" Oily 30 Iac x 10cc 2-13	10mg 3-12; 25mg 4-14; 50mg 10-8		" Italy 0-12 0-15 1-3 2-2	
" tab. 12; 4 Iac 0-10; 1 Iac. 2-0	" 10cc 25mg. 6-12; 50mg 9-12		Record 2-8 3-8 4-2 7-0 13-4	
" Oint doz. Eyo 5-4 Skin 8-8	Vit B12 5cc 100M Glaxo 3-12		LoerLockBD 6-12 10-0 12-0 16-8 32-0	
" Lozenges 100 2-2	" Eng. 10 cc. 3-0 200M 4-8		Jap Sup 1-6 1-14 2-4 3-8 4-12	
Dieristatin Squibb 1-6-0	" 5cc 500M 6-10 1000M 12-0		Re. 1-0 more for side nozzle.	
Beclomycin 1 g. Pfizer 1-3-0	" B Comp. 0-13 TCF 3-2		M. Case Jap 2cc 2-2 5cc 3-2 10cc 4-2	
Rhodia 0-15-6; 6 Iac 0-0 USA 0-15	Aminophyllin 100 1-4; 500 4-8		Ind. 1-4 1-12 2-8 2-14 5-0	
Synthomycin Kap. 12-14; Liq. 8-6	Aspirin Eng. 4-8; 1000 Ind. 3-9		Lint 3-0; Cotton 1-12	
Isonicotinic Acid Hydrazide German	Atebrin Bayer 1000 14-8; 300 4-4		Needles Stainless Steel:	
Chloromycetin kap 14-14; liq 11-8	Calc Lactas 1000 3-12		Eng. 2-12 Down 3-10 doz Record	
C.A.F. 12 cap Bel. 7-8, Italy 8-2	" Gluconate 1000 5-8		" 3-6 " 3-14 " All Glass	
Aureomycin 8 cap 17-12; 16 28-4	Gynomin 1-11; Speton 1-11		USA 5-0 Jap 1-10; B.D. 9-8	
Terramycin 16 34-0; 8 17-12	Camoquin 1000 118-0; 3 Pkt. 0-6-3		Thermometers 4min. Hicks 2-8	
Quinine Ger. 49-4; Java 46-8	Ephedrine Hyd. 4g 100 0-14 1000 4-10		Zeal Eng USA Jap. Sup. Flat	
oz. 3-4; Howard 6-4 oz	Easton 4dr 100 1-6 1 dr 100 1-14		27-8 13-8 10-12 8-0 8-8 12-8	
" B.G. 41-12 Howards 52-4	Cibazol 20 1-10; 250 18-0		Erkameter	64-8
" Tab 2 gr 2-4 5 gr 4-8 100	Soda Mint 1000 1-8 Eng. 3-2		Salin app. comp. 500cc	8-0
" 1000 2gr. 18-8; 5 gr 38-12,	Mepacrine 1000 12-8; ICI 12-12		Abs. Gauge 20yd	3-8
" Howard 5gr. x 1400 48-12	Folic Acid 5 mg 100 6-0		Ear or Glycerine Metal Syringe	
" Bihyd. 2 gr 3-14 5 gr 6-8	Multivitamin coated 1000 9-8		2oz 4-8 4oz 5-8	
Equilino Germ. 4-0	Paladria 1000 1 g 22-8 3 g 49-12		F.L. ord 1-12 Sup. 3-0 doz.	
[Howards 4-4; Java 4-0	Vit. C 100 mg 2cc 6 1-6; 50 6-0		" Crocodyl finish 4-0	
Quin. Bihyd. 100 x 10gr x 2cc	" 500 mg 5cc 6 2-6; 50 11-4		Stethoscope B.D. 10-12; Ger 8-12	
Ind. BDH B.W. EVANS	Pamaquin Tab. 500 9-12 [1000 9-0		Wall Thermometer Jap. 1-8	
13-0 22-0 33-8 22-0	Phenobarbiten Tab. 1/2 gr. 100 1-8;		Vit. C 50 mg 1000 8-4 100 1-8	
8-8 14-12 5gr x 100 amp	Pot. Chloras 1000 3-2 500 2-2		" 100mg 100 2-6; 1000 16-8	
Aminophyllin 6x10 cc. Ger. 1-14	Riboflavin Tab 5mg 100 1-8; 1000 8-8		Vit B Complex 100 1-4 1000 7-12	
Vit. B1 10cc 50mg 1-4; 100mg 1-8	" 10mg 100 2-8; 1000 19-12		" B1 10mg, 1000 10-14 100 1-10	
Camphor-in-oil 10A 0-8; 100A 4-8	Resochin 10 1-5; 100 9-6		" 5mg 100 1-6 1000 8-0	
Campolan 2cc 5 5-10 50 54-0	Saridon 10 1-1; 250 24-8		Artery Forcep 2-0 Scissors 1-4	
Calcium Gluconate 10% 100amp	Sulphanilamide 500 3-12 1000 6-12		Scalpel 1-4 Probe 0-6	
5cc 7-8 10cc 9-0	Sulphaguanidine Powder 5-2		Tongue Depressor 1-0 folding 2-0	
" Sandoz 5x10cc 5-0 10x5cc 8-8	" Guinadine 1000 10-14 500 6-0		Tooth Forcep Universal 3-14	
" with Vit C 10x5cc 9-12	" Boots 500 8-4		Ext Ergol Liq 4oz 2-8 lb 8-12	
" 5x10cc 5-8; 50x5cc 47-0	" Diazine 100 7-4 500 31-0		Aletris rio 9-4 Eng. 1-14	
" Vit. C Ger. 200 mg.	" Mezathine 500 24-12 100 5-6		Pot. Bromide lb. 3-6 Vibex 4oz 4-8	
10x5cc 4-10 [10ccx5 amp. 3-8	" Thiazol 1000 Ind. 16-4 Boots 22-8		Aspirin 3-14 Sod Salicylas 3-12	
Distill Water 100 amp 2cc 2-6	M & B 693 25 1-10; 500 31-0		Totaquina pow USA 40/- lb. 26-0	
5cc 8-2	" 760 25 1-12; 500 26-0		Trinitine 1/100 gr. 500 1-12	
Emetin Hyd 1/2 gr 100A 48-8 12A 5-12	" Nivaquin 4 0-6; 100 8-12		Soda Citrate 1002gr. 1-4 5gr 1-10	
BDH 7-4; B.W. 7-4; P.D. 6A 6-0	" Sulphaguanidine 500 11-4		Fountain Pen Parker Type Sup. 2-12	
Emetine 1 gr 12A Eng. 9-8	" Sulfadiazine 500 35-8 25 2-10		Plastic Doctor's Bag 12" 5-12	
Emetine 1gr x 6amp P.D. 8-14 BW 6-12	Sulphatriad 100 7-12; 500 36-4		Stethoscope Bag Plastic 1-0	
Glucose Sola. 25% 25cc 6A Thile 8-2	Santonine & Calomel 100 3-12		Fountain Pen Torch Lamp. 3-0	
Irgapyrin 5A 7-4; 60A 85-0	Soda Salicylas tab 1000 5-0		" Eng. gold cap 18-8	
Milk with Iodin 5cc 100 7-4	Soda Bicarb 500 1-4		Purity Barley 1/2 lb. 1-6 [L 5-12	
N.A.B. 30 0-11 45 0-18 60 0-15	Yeast Tab. 1/2 gr 1000 6-8		King Pessary each 0-6 Viskel S 3-4	
Progesterone Camp 1 cc	Oint Calomel 1 oz 0-10		Progynon 1mg. 3A Schering 4-4	
10 mg 4-0; 25 mg 4-12	Atropia oint 1/2 oz 0-10		Cincophan 100x5 gr. 3-8	
10cc 25 mg 6-0; 10mg 4-4	Glucose Pow. 4 oz. 0-5, 1 lb. 1-1		H. Tab. Atropia Sulph/COgr 20BW 0-7	
Liver Ext. TCF 10cc 2-6	Vit. K 100A 11-12 6A 2-4		" Emetin Hyd. 1/2 gr 20 4-4	
	Vit. K 15mg 100 1-4, 1000 6-6		Benadon amp. 6 3-14 tab. 20 8-10	

Suppliers to Govt. Municipal and Charitable Institutions.

SHANTI TRADING CO., Palton Road, BOMBAY-1.

(New Citizen Bank House)

Items not quoted will be supplied at lowest possible Rates

IN SERVICE LIES SUCCESS

"Grams"
"BATTENS"



LEUKOLASTIC

ELASTIC ADHESIVE BANDAGE

Extremely pliant and soft with excellent adhesive qualities, it adapts itself to any shape and will not loosen or curl at the edges. There is an extremely wide range of applications, the most important being that of a compression bandage, e.g. in all injuries to joints, ligaments and muscles.

LEUKOLASTIC Bandages are available in lengths of 3 yds., when stretched they will extend to about 5-6 yds. Important to know they are supplied with the adhesive coating outside which makes bandaging easier and which allows the compression to be adjusted and localized according to the special requirements of each case.

P. BEIERSDORF & CO. A.-G. HAMBURG
Sole Agents in India: PARRY & CO. LTD. - Madras - Calcutta - Bombay - New Delhi

A-El 6b

3 LIPOTROPIC PREPARATIONS

Containing
METHIONINE, CHOLINE, INOSITOL,
BETAINE, FOLIC ACID, VITAMIN B₁₂ etc.

from
ZANDU
Pharmacists of Repute

MECHTOL SYRUP

Bottle of
2, 4 & 16 ozs.

MECHTOL CAPSULE

Bottle of
25, 100 & 500
sealed capsules

MECHTOL PARENTERAL

Box of
6, 25 & 100 amps
of 2 cc.

For Literatures and samples, please write to
THE ZANDU PHARMACEUTICAL WORKS LTD.,
Gokhale Road South, P. O. Box No. 7015, Bombay-28

SPECIAL OFFERS FOR DISPOSALS AND OTHER ITEMS

Packing Free, Postage extra. Packing Free, Railway freight extra.

Alom Comp. Tab. 1000 P.H. 6-0 bot. Antiseptic Pens Lilly (Methio- late Tinct) doz. 1-8 Bandages (Non-sterilise) 2x8 yds. Brown USA doz. 2-0 White (Non-sterilise) 2x8 yds. Johnson USA doz. 4-2 Bismuth Carb & Soda tab. 10gr. x 500 BPH tin 5-4 Blue Oint 1/2 oz. Tube USA doz. 2-0 B.W. Eucetone Bismuth Iodide 1 gr. 100 tab. 12-0 bot. Camphor in Oil 5gr. 100 amp. Cipla per box 4-4 Calomel Oint 1 oz tube USA doz 3-12 CHINIOFON tabs. 50 Bateria coated Norwich USA doz 7-8 Chintofon tablet is most effective for Dysentery Cough Lozenges 500 Kerfoot tin 5/- Eye Preserving Set USA doz. 6-8	Evan's Manganese Butyrate 8x1 5 cc. box 0-14 Ferri Sulph tab. 3gr. x1000 cl. tin 1-8 Fungicidal Oint 1oz tube USA doz 7-8 Gauze Surgical Sponge 2"x2" pkt. of 200 USA pkt. 2-8 Iodine amp. (MOP) for external use box of 8 amp. Eng. box 0-4 Lucarson tab 500 M & B 22-0 tin M.B. 693 amp. 25 1 gm. box 7-0 Merthiolate OPTH Oint 1/8 oz. Lilly tube 0-8 New Fold Gauze 1/2"x100 yds. fourply Johnson pkt. 1-0 New Fold Gauze 1" 100 yds. fourply Johnson pkt. 1-10 Nikathamide Amp 17cc BOPW (Uoramin) box 0-12 PAMAQUIN Tab 500 ICI doz 6-8 For the treatment of Malaria	Procain Hyd. 300 x 25 amp. box 3-8 Procaine Hydrochlor Solution 60cc. 1 per cent Boots Bot. 0-15-0 Proflavine tab. 500 ICI bot. 0-14 Record Syringe 10cc Military Needle Mount each 3-8 Roche Riboflavine 1 mg. doz. 1-0 50 amp (Vitamin B₁₂) box 1-0 Stovain Amp. 6x100 M.B. 1-4 box Stethoscope Comp. ea. 4-4 box 3-8 Sulphamezathine 300 25 amp ICI Sulphaguanidine tab BP. 500 5-12 tin Sulphathiazole tab B.P. 500 8-8 tin Suture Needles Eng. Finest Quality Sulphanilamide Cream 1/4 doz. Lilly 4 oz doz 5-4 Tourniquet Field USA a doz. 8-0 Zinc Oxide Oint. 1oz tube USA 22-12
--	---	---

SAVERI & SONS.
Dealers in: DRUGS, MEDICINES, 18, PRINCESS STREET, FIDAL BUILDING, BOMBAY-2.
Tigram: DOBEGA Tiphone: 28180

CONTRACEPTIVES FOR FAMILY PLANNING

	Each	Doz.
French Paragons	Rs. 0 4	Rs. 3 12
H.W. Sheaths	0 5	5 8
Silk Paragons	0 12	8 8
Health Paragons	1 0	11 8
Silk L. Paragons		

	Each
Rubber Vaginal Check-Pessary	Rs. 2 0
Neurelone Jelly Tube	2 4
Gynomin Tablets 12 Tabs.	2 8
Whirling Spray Syringe (IMPROVED)	7 8
For Vaginal douching	

HEALTH & CO. (A.M. Dept.)
1st Floor, Opp. Majestic Cinema,
GIRGAUM, BOMBAY-4.

THE EDITORS OF

'HEALTH'

will be pleased to consider

ARTICLES, NEWS, VIEWS,
AND PHOTOGRAPHS

relating to health & healthful living

'HEALTH,'

323-24, Thambu Chetty St., MADRAS-1

Dr. Rao's MATERIA MEDICA

of
PHARMACEUTICAL COMBINATIONS
and
SPECIALITIES

Also Known as a Standard Reference Book on
"PATENT MEDICINES"
For the Busy Practitioner in his daily practice.

Eminent medical men speak highly about this work.
Well reviewed by the leading Medical Journals both in India and abroad.

Introduction by:

Dr. G. V. Deshmukh, M.D. (Lon.), F.R.C.S. (Eng.), M.L.A.

THOROUGHLY REVISED, ENLARGED
AND BROUGHT QUITE UP TO DATE

Most of the notable Indian Preparations have been included in this Edition.
Printing, get-up, etc., are similar to that of the previous Editions:
1st Ed.—1932, Supplement—1937, 2nd Ed.—1941, 3rd Ed.—1944
and 4th Ed.—1948.

Pages: 500, Royal Octavo; Edition: 1954, Price: Rs. 21-12.
Postage included.

Thousands of Doctors are using this very much needed Book

Have your copy now, from:

"MEDICAL DIGEST" (MEDICAL PUBLISHERS) BOMBAY 4

Telegram: MEDIGEST

Telephone: 22305

U. D. SULFO - ENTERON

U. D. Sulfo-Enteron combines the effects of both Iodochlor hydroxyquinoline and Phthalylsulphacetamide and provides a unique and highly effective therapy in combined Amoebic and Bacillary infection. It is administered orally and is comparatively non-toxic in doses within therapeutic limits.

Packings :-

Phials of 20 & 100 tablets (grs. 7½ each)

TELEPHONES
Bank 7211
1901

UNION DRUG CO. LTD.

285, BOWBAZAR STREET
CALCUTTA-12

CHAMBER
"BENZOLIC"
Calcutta.

Madras Depot:
"Sakar Mansion,"
2, Jones Lane, Madras-1

Bombay Depot:
Hargovind Desai Buildg.,
14, Old Hanuman Lane, Bombay-2

Assam Depot:
Assam Trunk Road,
Gauhati (Assam)

Dr. U. RAMA RAU'S Hand Book on FIRST AID IN ACCIDENTS

Revised by : Dr. U. KRISHNA RAU, M.B., B.S.

Explains as to how to render First Aid in Accidents such as :-

Fractures, Concussion, Fainting, Convulsion, Shock, Collapse, Sun-Stroke, Heat-Stroke, Asphyxia, Shock from Electricity and Lightning Shock, Burns, Wounds, Bites, Snake-Bite, Bruises, Strains and Rupture of Muscles, Poisoning, Insensibility, etc.

The book written in popular language and running to 240 pages, Crown 16mo with many illustrations, has been found very useful by the lay public in rendering First Aid scientifically in cases of accidents till the arrival of a doctor. Members of the medical profession have found it useful to deliver lectures to lay men on First Aid.

The book is being published since the First Great World War and has run to several editions and thousands of copies have been sold up to now. It is published not only in English but also in Tamil, Telugu, Canarese, Malayalam and Hindi. Mines, Factories, Police Force &c. use these books largely.

Price Re. 1/- or Sh. 2 per copy for any edition.
Postage 7 As. Extra per copy

Value may be remitted along with the subscription to 'Antiseptic' or 'Health' or both.
COPIES CAN BE HAD FROM:

SRI KRISHNAN BROS.,
323-24, Thambu Chetty St.,
MADRAS-1

For treatment of HYPERTENSION RUMANOL with VERATRUM VIRIDE

is still the medicament of
CHOICE

In the dosage required to lower blood pressure, Veratrum Viride does not affect cardiac rate, respiration or temperature. In controlled cases, within therapeutic limits, no severe toxic effects have been noted.

With proper study of Patient reaction and adjustment of dosage until the optimum schedule is determined, headache and malaise are quickly dispersed, giving rise to a sense of well being in the Patient. This subjective improvement usually precedes a significant fall of blood pressure.

Literature from :

JUGGAT SINGH'S SON & BRO.,

Regal Cinema Building, Apollo Pier Road, BOMBAY 1

M/s. UNIQUE PHARMACEUTICALS,
219, POONAMALLEE HIGH ROAD, MADRAS-7.
SAHIB SINGH AGENCIES LTD.,
Connaught Place, NEW DELHI.

BHOOPUR CO.,
87, CHOWRINGHEE ROAD, CALCUTTA.
NEW INDIA MEDICAL STORES,
BIRHANNA ROAD, KANPUR.

WHOOPING COUGH? PRESCRIBE

PENTAKOS!

* 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 correct this chemical change and eliminate the spasms.

* QUICK and ECONOMICAL treatment for WHOOPING COUGH.

References: 1. Whooping Cough a problem—Medical Digest, Vol. 21, No. 11, Nov. 1953.

2. Acidifying Drugs in Whooping Cough Special Therapeutic Number, Indian Medical Review.

Literature from :

JUGGAT SINGH'S SON & BRO.,

Regal Cinema Building, Apollo Pier Road, BOMBAY 1

M/s. UNIQUE PHARMACEUTICALS,
219, POONAMALLEE HIGH ROAD, MADRAS-7.
SAHIB SINGH AGENCIES LTD.,
Connaught Place, NEW DELHI.

BHOOPUR CO.,
87, CHOWRINGHEE ROAD, CALCUTTA.
NEW INDIA MEDICAL STORES,
BIRHANNA ROAD, KANPUR.

NATH & COMPANY,

Telegrams: "CREOSOTE"
 23-25, Parekh Building, Old Hanuman Lane, Princess St., Bombay-2
 PACKING FREE for postal orders FOUNTAIN PEN Parker type free for Rs. 250/- in six months & PLASTIC DOCTOR BAG free for Rs. 600/-
 Terms: V.P.P. or Bank
 Ref. No. May '55

Penicillin G Cryst. Dmx Glaxo or Rheda 10 lacs.
 0-6-9 0-9-9 0-11-9 Belg.
 0-0-0 0-8-6 0-11-6 Belg.
 Dicyclo Strep 1 gr Pfizer 1-3
 Dihydro Strep 1 gr Pfizer 1-3
 France 0-11-3 DMX or GL 0-15-9
 Procin Pen 20 lac GL or DMX 1-11-6
 " 1 lacs Squibb 0-10-9 P.F. 0-11-6
 " GL Dmx. 0-9-3 Belg. 0-7-3
 Procain 30 lacs Oily Heyden 2-12
 Penicillin Skin Oint 0-11 Eye 0-7-6
 " Tab. 1 lac 0-10-0 1 lac 1-15
 " 12x2 lac 2-8; Loz. 50 1-14
 Vit. B12 100 micro 10cc Eng. 2-14
 " 200 10cc 4-8 500 mce. 5cc 6-8
 Vit. B1 100mg 10cc 1-8 50mg 1-9
 " B Comp. 10cc Eng. 0-12
 " TCF Formula 10cc Ger. 1-8
 Folic Acid 15 mg 10cc Eng. 2-8
 Liver Ext. Fortified c Vit. B12
 20 mic. 10cc 2 USP 5 USP 10 USP
 2-10 3-2 3-6
 Liver Ext. 10 cc. Eng. 2 USP 0-0
 5 USP 2-2; 10 USP 2-6; 15 USP 2-14
 Testosterone Propionate Eng
 25mg. 10cc 6-0 6x1cc 5-4
 " 10mg 6x1cc 3-11
 Progesterone 5mg. 3x1cc box 1-10
 Vit. K amp 6x1cc 1-14 100amp 11-0
 Cal. Gluco. Ind. 100x10cc box 9-0
 " Ger. 10% 5x10cc box 1-14
 " c Vit. C 100 mg 5x10 cc 3-9
 Chloromycetin 2Cap 14-14 Liquid 11-8
 C.A.F. Italy 12 7-12 Kemycin 10-6
 C.A.F. 100 Caps. 56-0 Lqd 8-0
 Chloran. belical Belg. 12 7-4 [33-12
 Aureomycin 16 Cap. 27-12 Terramycin
 Synthamycin Cap. 12-12; Liquid 8-6
 Combiotic Agr. 2-14 Ambystin 1-5-6
 Camoquin Pkt. 4-14 doz; 100 12-0
 PAS 100 2-6 500 9-10 1000 19-8
 " Cal. 100 2-8 250 6-4 500 9-8
 Quinine Howds. 50/8; BDH 16-0
 " Germ. 49-8; Bengal 41-12
 " 1 oz Jap. 3-14; Beag. 3-0 How. 6-0
 Q. Bihydro Amps. 100x10 grs x 2cc.
 " Ind. B.D.H. Evans BW
 " 12-8 22-8 22-0 33-8
 " 8-4 15-0 100x5gr. x1cc
 Euquinine Roche 9-8 Germ. 3-15
 " How 4-6 Java 3-15 oz.
 Q. Tab. 2 grx 100 2-9 5gr 4-15 B.D.H.
 " 5gr 1400 How. 47-0 1000 31-8
 Q. Bihydro 2grx 100 3-14; 5gr 7-0
 Pethidine amp 100mgx12
 " 100 mg 100 tab 20-0 [A 100 75/-
 Stovarsol 500 25-8
 Atebrin Bayer 1000 14-0; 300 4-0
 Aspirine 1000 Eng. 4-7 Ind. 3-8
 Ephedrin 1/2 Gr. 1000 Eng. 4-8
 Mepacrine Eng. 1000 11-12 MB 11-12
 Quinacrine UFA 5000 54-8; 1000 11-12
 Morphia Tartrate Amp. 5 x 1 cc. 1/2 gr. 0-10 box.
 Omnopon Amps 1/2 Needle Tube 0-4
 Enteroform 20's 2-12; 100's 11-6
 Enteroquinol 20 2-2; 100's 9-6
 Paludrin 1000 x 1 gr. 21-8
 " 3 grx 500 21-0 Strep 1000 16-8
 Multivitamin Eng. 1000 Orig. 9-4
 Vit B1 5 mg. 1000 7-10 [100 1-7
 Vit. B1 10mg. Eng. 1000 10-12
 Vit. B2 10mg 100 1-8 500 4-12
 " B2 Tab 20mgx25 3-8 100 10-12
 " K 10mg 100 1-6 1000 5-12
 Vit. B Comp tab Eng. 100 1-4 1000 7-0
 " C tab 50 mg Eng. 1000 7-11
 Potas Chlorus Tab. 500 2-2 Pow. 1b 2-0
 Calcii Lactas tab. 1000 3-9
 Aniot & Steel Pill Aust. 100 1-2
 Aminophyllin tab Eng 100 1/8 1000 7-12
 Cinchophan (Atophan) 100 x 5gr. 3-8
 Folic Acid Tab 5mg 25 1-14; 100 5-12
 Calcii Gluconate tab. 7 1/2 gr. 1000
 Saridon 250 21-4; 10tab 1-2 [5-8
 Nivaquin 10's 1-1 100's 8-12
 Tinct. Camphor Co. PD 500 3-8
 Santonine Calomel 50 2-2 100 3-11
 APC tab. 1000 Ind. 8-0 100 1-5
 Phenobarbit. 100x1gr 1-6 1000 8-8
 Cibazol 250 13/-; Voic Tab 100 0-15
 Nicotinic Acid W.B. 500 3-8
 MB 760 20-0; MB 693 500's 30-8
 Whifens Emetine Hyd. 1/2 Grx 20
 Resochin 10 tabs 1-3 100 9-8
 Soda Mint Howd. 1000 2-14 Ind. 1-9
 Sulpha Tab. 1000's 500
 " nilamide 6-12 3-13
 " guinidine 11-2 5-15
 " thiazole Boots 22-4 13-8
 " Tedco 500 10/- Ind. 8-4
 " Opil 1000 16-8
 " diazine 100 7-4; 1000 57-8
 Sulphatriad MB 100 7-12 36-4
 Sulphonamide Powder 1 lb. 5-0
 M.B. Thiazole 500's 45-0
 Sulphamezathine ICI 500 21-6
 " cream 4 oz 5-8 1 oz 1-12
 Atropin Sulph Dr. 2-9 Gentian Violet
 Digoxin BW 12x1 cc. 1-8 [oz. 1-5
 Codina Phos 5-0 Dionine dr. 6-8
 Ext. Ergot. Ind. 4 oz 2-8; 1b. 8-6
 Sodasaly 3-4 lb. Santonine MB dr. 9-15
 Oil Chinapod 4-8 Aspirin 3-9
 Silver Vitellin 2-0 Menthol oz 3-8
 Protargol 1-1 Pot. Bromide 3-6
 Aletris Eng. 2-2; Rio USA 9-0
 Atebrin 3 g. 25A 10-0; 6x1 gr. 3-2
 Atophanyl Amp. IV or IM Eng. 4-0
 Berlin 10cc 50mg. 2-10; 100mg. 3-7
 Calcii Ostelin 15cc. 3-3 Combex 10cc 6-14
 Camptol 5 amp 2cc 6-0 10cc 5-0
 Aminopylin Ger. 6x10cc. 2-0
 Camphor oil 10A Hind 0-4
 Distil Water 100 amps
 2 cc. 2-4; 5 cc 3-0; 10 cc. 4-0
 A & H Emetine Hydro 6x1gr 4-4
 BIDH " 6x1gr 2-15 25A 10-12

The Antiseptic

A Monthly Journal of Medicine & Surgery

For the use of Registered Medical Practitioners, Hospitals and Laboratories only

Founded by the late Dr. U. RAMA RAU in 1904.

Editor: U. KRISHNA RAU, M.B., B.S., M.L.A. Associate Editor: U. VASUDEVA RAU, M.B., B.S.

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

P. O. Box 166

Telephone: 2168

Telegrams: "ANTISEPTIC"

Subscription Rs. 7.8-0.

Foreign Rs. 10 a year.

Single Copy Rs. 1-0-0 in advance.

ages from 413 to 492

Contents on Advt. page 2.

Index to Advertisers on page 4

IN BRONCHIAL ASTHMA . . .

The inhibitory action of Adrenaline without its excitant effect.
 Greater relaxation of smooth muscle. Effective orally.

ISOPRENALINE-BOOTS

One per cent. solution for inhalation — 100 cc. Bottle
 Tablets for sublingual administration — Box of 25 and 100
 BOOTS PURE DRUG CO. (INDIA) LTD, BOMBAY.

VITAZYME

A combination of Diastase, Pepsin and
 Vitamin B Complex for rational treatment
 of all cases of carbohydrate and protein
 indigestion

For further particulars, please write to:-

East India Pharmaceutical Works Ltd.
 CALCUTTA-46

CONTENTS

ORIGINAL ARTICLES	PAGE	CASES AND COMMENTS	
Wanted a National Programme for the Control of Venereal Diseases. —R. V. Rajam, M.B., F.R.C.P. (Edn.), Madras ...	413	Cerebral Malaria Associated with Atypical Clinical Features with Autopsy Findings. —D. Bhaskara Reddy, M.D., Visakhapatnam ...	463
X-ray and Radium Therapy in the Treatment of Certain Inflammatory and Benign Conditions. —K. M. Rai, M.B., B.S., F.R.C.S. (Edn.), D.M.R. (I), Madras ...	427	Sulphone for Local Therapy in Ophthalmic Practice. —Gopal Chandra Sen, M.B., D.O.M.S., Calcutta, ...	468
Thiersch's Operation for Complete Prolapse of the Rectum in Children. —U. Mohan Rao, M.B., F.R.C.S. (Eng.), and R. Nanjunda Rao, B.Sc., M.B., Madras ...	437	EDITORIALS	
Some Features in the Development of Dynamic Psychiatry in the United States. —Leon J. Saul, M.D., and Andrew S. Watson, M.D., Philadelphia-4 ...	441	Self-Sufficiency in Drugs for India ...	471
Treatment of Rheumatism and Arthritis with Indigenous Drugs. —M. V. Bansod, M.B., Poona ...	451	The Promotion of Mental Health ...	473
Surgery in Mofussil Areas. —Capt. R. S. Kesava Raj, M.B., B.S., South Kanara ...	457	Rejoice with us Dear Reader ! (Further extract from Reviews of our Golden Jubilee Issue) ...	475
Some Observations on Anæmias and their Treatment. —Jayant M. Bhatt, M.B., B.S., Jamnagar ...	461	GLEANINGS FROM THE MEDICAL PRESS	
		Ophthalmology ...	476
		Dermatology ...	478
		Obstetrics and Gynaecology ...	480
		Surgery ...	459, 460, 484
		Medicine and Therapeutics ...	426, 436, 449, 450, 455, 475, 487
		Reviews of Books and Periodicals ...	491
		Books Received ...	492
		Notice to our Readers and Advertisers ...	492
		Corrigenda ...	492

STERATHAL

"WB" brand of Phthalyl Sulphacetamide

For—bacillary dysentery, early cholera, non-specific gastro-enteritis, typhoid fever, and ulcerative colitis—

SUSPENSION: a pleasantly flavoured presentation of 3 gm. STERATHAL per fl. oz. in a very finely divided state, with Pectin and Kaolin: in bottles of 2, 4, and 16 fluid ounces.

TABLETS: each containing 0.5 gm. STERATHAL, in containers of 25, 100, 500 and 1000 tablets.

DOSAGE: See special literature available on request from

Manufacturers Sole Agents:

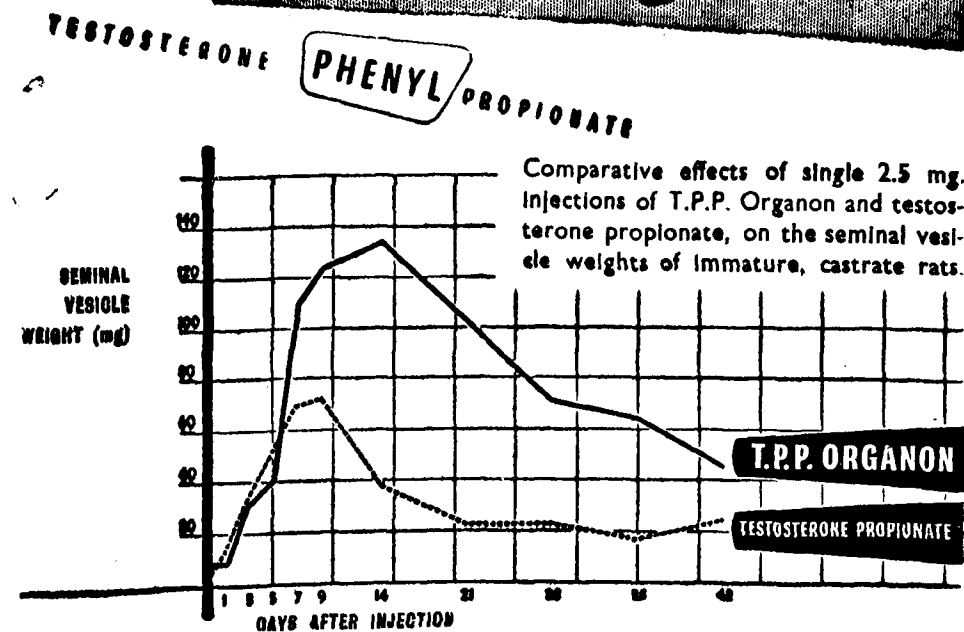
WARD, BLENKINSOP & CO.
(INDIA) LTD.,
1/110, Haines Road, Bombay-18.



Distributors in India:
EVANS MEDICAL SUPPLIES
(INDIA) LTD.,
Bombay Calcutta Madras

THE NEW MALE HORMONE ESTER

T.P.P.-Organon



- LONGER ACTING AND MUCH MORE POTENT THAN TESTOSTERONE PROPIONATE
- FEWER INJECTIONS REQUIRED
- TREATMENT SIMPLIFIED
- COST LOWERED

Indicated in conditions where testosterone propionate has hitherto been employed, T.P.P. Organon is presented for subcutaneous injection, in the following strengths—10 mg. per c.c. and 50 mg. per c.c.

Packs: 3 x 1 c.c. ampoules 1 x 5 c.c. vials

Literature on request

Sole Agents for India and Burma:

MARTIN & HARRIS LTD.

BRANCHES:

Calcutta: Mercantile Buildings, Lall Bazar St. Bombay: Savoy Chambers, Wallace St.
New Delhi: 22-a, Mahant Bldgs. Asaf Ali Road, Madras: Sunkurama Chetty St. Rangoon: P.O. 8. 97

ORGANON LABORATORIES LTD., LONDON

Hmmmm—Delicious Chocolate Flavor!



Yes! Because AUREOMYCIN has become indispensable in pediatric practice. Lederle now makes it available in a form especially designed for administration to children or others who are unable or unwilling to take capsules orally—

AUREOMYCIN*

Chlortetracycline HCl

Spersoids*
Dispersible Powder

A true low-dosage, broad-spectrum antibiotic, so free from trace substances that it represents almost the ultimate in purity. AUREOMYCIN Chlortetracycline, is

- effective by mouth;
- highly bacteriostatic in the intestinal tract;
- easily absorbed and gives prolonged blood levels;
- rapidly diffused into the cerebrospinal fluid...

readily enters cells and acts against intracellular invaders, and

• excreted in high concentration into the urine. AUREOMYCIN SPERSOIDS pleasantly flavored with chocolate, contains 50 mg. of Chlortetracycline HCl in each rounded teaspoon. The average oral dosage is 12.5 to 20 mg. per kilo of body weight for adults and children. Always administer each dose with or immediately after a meal, with a bland drink, preferably milk.

Packages: Jars of 36 Gm.

*Trade Mark

LEDERLE LABORATORIES (INDIA) LTD.
P. O. 8, 1974
BOMBAY 1

Other forms of AUREOMYCIN available:
Capsules: 250 mg.—Bottles of 8 and 50, Ointment:
Tubes of 1 oz., Ointment Ophthalmic: 1 oz. tubes.
Soluble tabs. 50 mg. Tubes of 12, Tablets: 15 mg.
—Bottles of 25.



sick people
need nutritional support...

THERAGRAN will

1. Help bring about earlier and more satisfactory recovery after surgery;
2. Help correct dietary deficiencies among "bad eaters";
3. Add greatly to the effectiveness of therapeutic and supportive measures in persons who are older or chronically ill.

THERAGRAN

THERAPEUTIC FORMULA VITAMIN CAPSULES SQUIBB

Each Theragran Capsule supplies:

Vitamin A (synthetic)	...	25,000 I.U.
Vitamin D	...	1,000 I.U.
Thiamine Mononitrate	...	10 mg.
Riboflavin	...	5 mg.
Niacinamide	...	150 mg.
Ascorbic Acid	...	150 mg.

1 Capsule daily Bottles of 7, 15 and 100

SARABHAI CHEMICALS, BARODA.
Manufacturers & Distributors of Squibb Products in India.

THERAGRAN IS A TRADEMARK A-2243

SQUIBB

INDEX TO ADVERTISERS

Advertiser	Page	Advertiser	Page
Aeon Chemical Industries Ltd.	79	Kothari Book Depot, The	7
Alarsin Pharmaceuticals (India)	60	Ledaria Labs. (India) Ltd.	29
Alomib Chemical Works Co. Ltd.	20, 39	Lever Bros. (India) Ltd.	24
Alkaloid Research Laboratories, The	60	Mandosa Drugs Ltd.	18
Allon & Hanbury Ltd.	28	Martin & Harris Ltd.	23, 64
Amarchand Sobchand	54	May & Baker (India) Ltd.	38
Asepticus Co.	78	Mukerji H. & Banerjee Surgical Ltd.	52
Associated Drug Co. Ltd.	58	Nestle's Products (India) Ltd.	21
Behar Chemical Works	78	Notifolids of India Ltd.	74
Bengal Chem. & Pharm. Works Ltd.	Inside Back Cover	Now Guardian of India Ltd.	18
Bengal Immunity Co. Ltd.	47	Oakley Bowdon & Co. (Madras) Ltd.	6
Birla Laboratories	48	Organon Laboratories Ltd.	3
Bhatia Surgical Works	72	Oriental Pharmaceutical Industries Ltd.	53
Boots Pure Drug Co. (India) Ltd.	Front Cover & 72	Oriental Surgical Works	7
Bread & Co. Ltd.	47	Pannalal Bros.	89
British Drug Houses (India) Ltd.	19, 45	Parko, Davis & Co. Ltd.	Outside Back Cover
Burroughs Wellcome & Co. (India) Ltd.	37, 42	Perry & Co. Ltd.	74, 77
Calcutta Chemical Co. Ltd., The	66	Pasteur Laboratories Ltd.	63
Calcutta Clinical Research	78	Pixie Products	78
Capco Ltd.	68	Popular Book Depot, The	8
Chemapol Ltd.	22	Princo Limited.	26
Chowgule & Co. (Hind) Ltd.	14	Ranbir Singh Yogashram, Sri	46
Ciba Pharma Ltd.	65	Ranbaxy & Co., Ltd.	78
Cilag-Hind Ltd.	25	Ravison Pharmaceuticals Ltd.	43, 63
Cipla Laboratories	31	Richard Kellmeyer (Kikamotor)	4
Corn Products Co. (India) Ltd.	69	Rikar Laboratories Ltd.	17
Cow & Gato Ltd.	67	Rosbay & Co.	57
Crookes Laboratories Ltd., The	11	Sandoz Ltd.	30
Current Technical Literature Co., Ltd.	8	Sanitox Chemical Industries Ltd.	45, 49
Dumex Limited.	57	Scientific Publication Concern	1
East India Pharm. Works Ltd.	71	Shah & Co., D.	4
Eli Lilly and Company of India Inc.	62	Shanti Trading Co.	80
Evans Medical Supplies (India) Ltd.	13	Smith Stanistreet & Co., Ltd.	49
General Electric Co. of India Ltd.	9, 10	Sreevatsa Chemicals & Drugs Ltd.	18
Geoffrey Mannors & Company Limited	33	Sri Krishnan Bros.	73
Glaxo Laboratories (India) Ltd.	35, 40	Stadmed Ltd.	55
Godrej Soaps Ltd.	79	Suren & Co. Ltd., W. T.	61
Health	73	Swann & Co. Ltd., W. R.	12
Herbertsons Ltd.	44	Therapeutic Pharmaceuticals	76
Hering & Kent	56	Unichem Laboratories	32
Himalaya Drug Co., The	16	Union Drug Co. Ltd.	58
Hind Chemicals Ltd.	59	Unique Trading Corporation	12
Horlicks, Ltd.	32	Universal Drug House Ltd.	18
Hygienic Research Institute	6	Volta Ltd.	34
Imperial Chemical Industries (India) Ltd.	5, 27	Wander Dr. A.	15
Indian Health Institute & Lab. Ltd.	8	Ward Blankinsop & Co. (India) Ltd.	2
Indoco Remedies Ltd.	60	Waterbury's Compound	54, 57
Indra Laboratories	79	William R. Warner & Co. Ltd.	46, 50, 52
Infia Ltd.	25	Zandu Pharmaceutical Works Ltd.	58
Jagkumar & Co.	77	Zone Chemical Co., The	60
Jammi Venkataramanayya & Sons	36, 41		
John Wyeth & Brother Ltd.	51		
Juggat Singh's Son & Bro.			

Fresh arrival of German MICROSCOPES

- Colorimeters
- Ovens & Incubators
- Centrifuge Machines
- Ultra & Infrared Lamps
- Sedimentation Racks
- Humometers Etc.

D. SHAH & Co.,
24, Sardar Grika,
Lohar Chawl, BOMBAY-2.

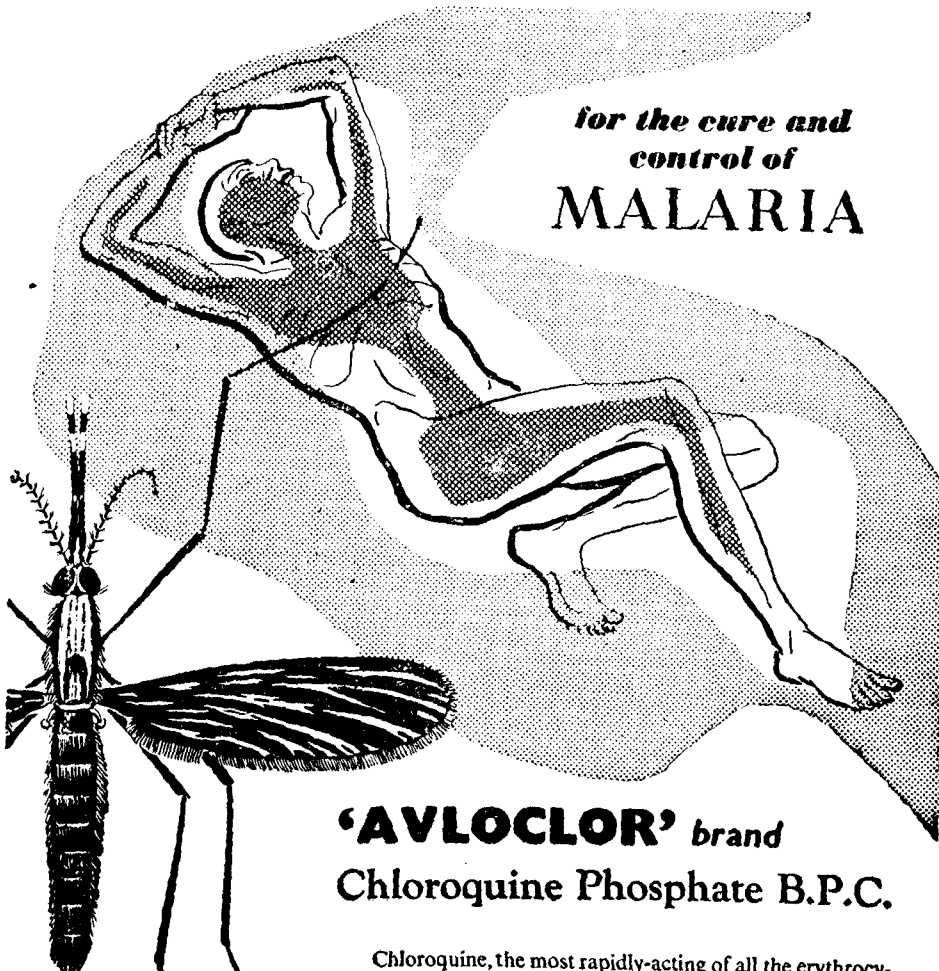
By **RAI Dr. A. R. MAJUMDAR BHADUR**,
Prof. of Clinical Medicine, Medical College,
Calcutta, India.

MODERN PHARMACOLOGY AND THERAPEUTIC GUIDE
Ninth Edition, Demy 8 1/2 pages and 102 diagrams.
with Supplement of Recent Advances 1954
Price Rs. 14 plus postage
Recent Advances 1954 only, Rs. 2/-
This contains up-to-date Pharmacology & Therapeutics exemplified by 500 chosen prescriptions and over 800 extra pharm. preparations, these being indexed under 210 diseases of daily practice. It has Indian Food Recipes and Electrotherapy. Concise Encyclopaedia of latest Drug Informations.

SCIENTIFIC PUBLICATION CONCERN,
9, Wellington Square, CALCUTTA 13

ERKAMETER *the bloodpressure apparatus*

for the cure and control of MALARIA



'AVLOCLOR' brand
Chloroquine Phosphate B.P.C.

Chloroquine, the most rapidly-acting of all the erythrocytic schizonticides in use today, is widely recommended as the drug of choice for the control of an acute attack of malaria, especially falciparum malaria in which it not only controls the attack but achieves radical cure by a short course of treatment. In semi-immune subjects, clinical cure can be achieved by a single dose of 4 tablets of 'Avloclor'.

The drug does not produce any serious toxic effects when given in therapeutic dosage.

Chloroquine has also established itself as a powerful remedy in hepatic amoebiasis, for the treatment of which it rivals emetine.

Available in tablet form (0.25 gramme) for oral administration, in packs of 4, 10 and 500.

ICI

IMPERIAL CHEMICAL INDUSTRIES (INDIA) LIMITED
Calcutta Bombay Madras Kanpur New Delhi
Ahmedabad Amritsar Bangalore Cochin

'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 1951, 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 1182,
BOMBAY-1

QUININE SALTS, TABLETS & AMPOULES

We have pleasure in announcing our appointment as Distributors of QUININE PRODUCTS manufactured by the Madras Government, Cinchona Department, Ootacamund.

Very high degree of purity and extremely attractive prices are now backed by our guarantee of prompt delivery and courteous service.

Doctors, Chemists & Manufacturers—Our price lists are in process of mailing. If you have not received your copy, please write or wire to us direct for your requirements.

OAKLEY BOWDEN & CO. (MADRAS) LTD.

11/12, First Line Beach, Madras-1.

Grams : WAREHOUSE

Phone : 2082.

Latest Arrivals of Timely Medical Books

	RS.	AS.
BOURNE—Synopsis of Obstetrics and Gynecology, 11th Ed. 1954 ...	15	10
DACIE—Haemolytic Anaemias: Congenital and Acquired, 1954 ...	31	8
HOLLAND & BOURNE—British Obstetric and Gynecological Practice:		
Vol. 1. Gynecology by Bourne, 1955 ...	59	15
Vol. 2. OBSTETRICS by Holland, 1955 ...	71	14
MACKIE & Others—Manual of Tropical Medicine, 2nd Ed. 1954 ...	48	0
MAINGOT—Abdominal Operations, 3rd Ed. 1955 ...	106	4
MAYO—Surgery of the Small and Large Intestine, 1955 ...	36	0
SHELDON—Diseases of Infancy and Childhood, 7th Ed. 1955 ...	31	4
WALSHE—Diseases of the Nervous System, 8th Ed. 1955 ...	15	0
WHITBY & BRITTON—Disorders of the Blood, 7th Ed. 1953 ...	39	6
ARRIVING IMMEDIATELY		
GOODMAN & GILMAN—Pharmacological Basis of Therapeutics, 2nd Ed. 1955 ...	60	0
CONN—Current Therapy, 1955 ...	44	0

Please write to us for your requirements of Medical books which will be promptly attended to:

THE KOTHARI BOOK DEPOT,

(Established 1935)

Exclusive House for Medical Books

PAREL, BOMBAY-12

'Gram : 'KOOBOOK'

Phone : 60805

Nylon "Atlas" Syringe

S. E. S. I. PROCESS—PATENTED
UNBREAKABLE

MADE IN ENGLAND

SPECIAL FEATURES:

- * Interchangeable barrels and pistons
- * Leak-proof nozzles and pistons
- * Coloured to B.S. spec. graduations
- * Does not affect the pH of solutions
- * Sterilization by boiling or autoclaving at 18 lb. steam pressure (120° C.)
- * Storage recommended in 5% aqueous solution of "Desogen" (Geigy)
- * Barrel and nozzle in one piece
- * Absence of soldered parts eliminates crevices
- * Pistons never stick
- * Completely hygienic and easy to clean
- * Receptacle for spare needles, etc. in piston
- * Convertible immediately from Record to Luer fitting without adapters

SIZES: 3 ml., 5 ml., 10 ml., 20 ml.

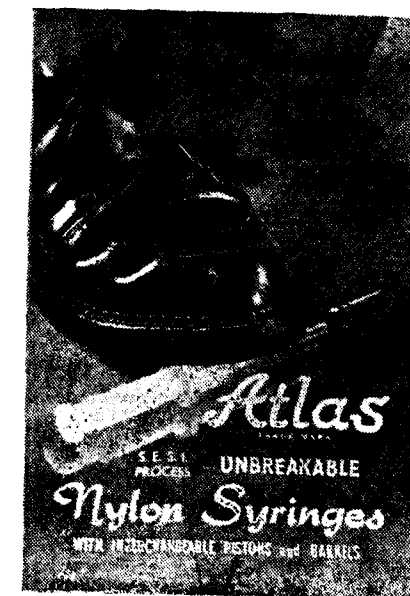
Sole Selling Agents:

THE ORIENTAL SURGICAL WORKS

Shagrirath Palace, Chandni Chowk, DELHI-6

Telo : 25381

Manufacturers:
ATLAS SURGICAL SUPPLIES LTD.
Manchester, ENGLAND



Dr. K. M. NADKARNI'S

INDIAN MATERIA MEDICA

Foreword by Col. R. N. Chopra

TWO VOLUMES

Pages 2367. In Attractive Box

"This is a monumental and informative work on Indian Materia Medica which will be widely welcomed by students and practitioners of Indian Medicine as well as by practitioners of other systems and other scientists interested in the vast extent and rich content of the pharmacopoeia of Indian Medicine...."

—The HINDU

THIS MONUMENTAL WORK
FOR RUPEES SIXTY ONLY

Detailed Prospectus on application

POPULAR BOOK DEPOT

Lamington Road, BOMBAY-7

Medical Books FOR THE General Practitioners

	Rs.	A.
BOURNE Heart Diseases	6	6
COPEMAN Rheumatism	6	6
DAVIS—Gynecology and Obstetrics in three looseleaf volumes	220	0
DONALD—Practical Obstetric Problems, 1955	33-12	
FAIRFIELD—Epilepsy	6	6
FLOREY Lectures on General Pathology 1954	47	4
FOOTE Varicose Veins	6	6
MILLER—Therapeutic Index, 1955	7-23	
MILLER—Therapeutic Index, '55	7	13
SELLORS—Modern Practice in Tuberculosis 1952 Edition 2 Volumes	110	4
SHELDON—Diseases in Infancy and Childhood, 1955	31	4
SPOT DIAGNOSIS, Vol. I, 1954	5-10	
SPOT DIAGNOSIS, Vol. II, 1955	6-6	
TIDY Synopsis of Medicine, 1954, 10th Ed.	21-14	
CURRENT TECHNICAL LITERATURE COMPANY,		
Madras Branch: LIMITED, Head Office:		
331-333, Thambu Chetti St., "INDIA HOUSE,"		
Post Box 128, Opp. G.P.O.,		
MADRAS-1 P. B. 1374, BOMBAY-1		

"Health"

PROTOZIDE

PROVIDES

Chloro-Iodo-oxyquinoline to act on intestinal protozoa;

Phthalyl Sulphacetamide to act on intestinal bacteria; and

Vitamin B Complex to remove the intestinal atony and other symptoms attributed to sulphonamide treatment.

Indicated in prophylaxis and in the treatment of intestinal amoebiasis, acute or chronic, bacillary dysenteries, ulcerative colitis.

INDIAN HEALTH INSTITUTE & LABORATORY LTD.,
CALCUTTA-28

Madras Depot: 4/149, Broadway, Madras-1

**PERSONAL WEIGHING MACHINE**

Best German Make

* A daily weighing will give you assurance.

* A daily weighing will secure your well-health.

* A daily weighing will protect you against surprise.



To be had at a moderate price through

JAGKUMAR & COMPANY

Prospect Chambers Annexe,

317/21, Hornby Road, BOMBAY 1

ANTI-INFLAMMATORY LOCAL THERAPY

**HYDROCORTISONE ROUSSEL**

ROUSSEL

IN DERMATOLOGY

(CUTANEOUS APPLICATIONS)

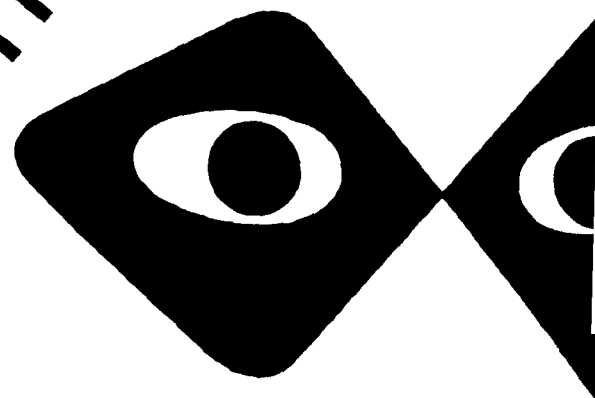


OINTMENT

Cutaneous Allergies - Eczemas
Exudative Dermatoses
Contact Dermatoses - Pruritus

Tube of 3 gms. of ointment
1 % suspension of
Hydrocortisone
Acetate

COLLYRIUM



Inflammatory and allergic affections
of the anterior segment of the eye.

Dropper-vial of 3 cc. of 1 % suspension of Hydrocortisone Acetate

IN OPHTHALMOLOGY

(OCULAR INSTILLATIONS)

LES LABORATOIRES ROUSSEL
LABORATOIRES FRANÇAIS DE CHIMIOTHÉRAPIE
89, rue du Cherche-Midi - PARIS (France)

Particulars, Literature, etc. from
FRANCO-INDIAN LTD LABORATORIES
Bapnu Ghar, Hornby Vellard, BOMBAY 18



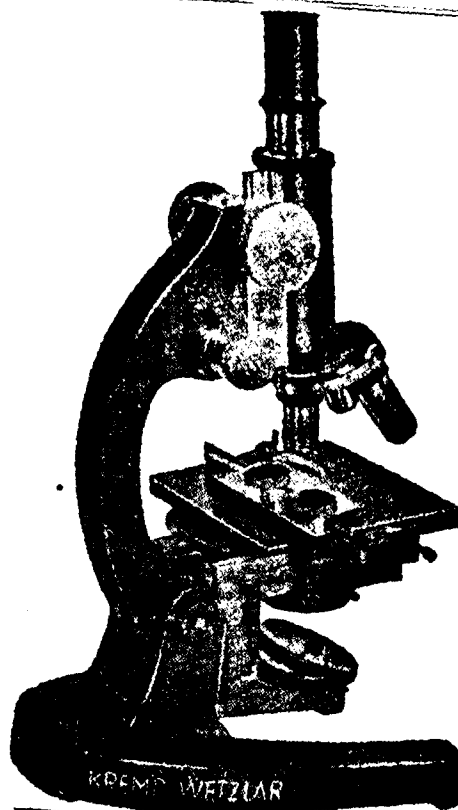
Easily Assimilable Iron

Neo-Ferrum (Infants), though based on the same formula as Neo-Ferrum, has been specially adapted for paediatric use. Freely miscible with milk, it is readily absorbed and does not give rise to gastro-intestinal disturbances. In the vehicle, adjustment of the sugar-alcohol ratio has made the preparation more palatable yet equally stable.

CROOKES NEO-FERRUM *for INFANTS*

*Crookes Neo-Ferrum (Infants) is supplied in ½ oz. bottles with pipette.
Crookes Neo-Ferrum is supplied both as liquid and tablets.*

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



"KREMP" DOCTOR'S MICROSCOPE ECK 3/31

(Weetzlar—Germany)

This Model has a special **Objective 6L (1. — Long Focus)** which is essential for Blood Corpuscle Counting work. It has an own magnification of 11x.

STAND E Inclination up to 90°. Standard draw-tube (extension) of 37 mm ϕ graduated and coarse focusing screw on both sides with graduated drum.

FIXED square object stage 110 x 110 mm. substage; with detachable graduated mechanical stage III with scale and Vernier reading to 1/10 mm. With two lens condenser of n.a. 1.4 with iris diaphragm and filter bearing; movable in a sprung sleeve.

Plane concave mirror movable to all sides.

OPTICAL EQUIPMENTS:

Nosepiece for 3 Objectives;
Achromatic Objective No. 3 (10.3x)
Achromatic Objective No. 6L (11x)
Achrom. Oil Immersion Objective 1/12 (105x)
Huyghens eyepieces: 6x, 10x, 15x.

Complete as described above in a mahogany cabinet with lock and key Price Rs. 820/- ed.

CONTACT:

UNIQUE TRADING CORPORATION,
51-53, New Hanuman Lane,
BOMBAY-2

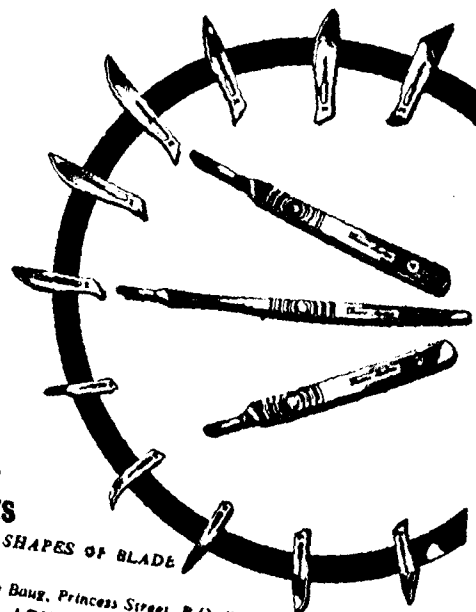
Grams: 'UNILAB'

Phone: 26622

Traditional and International

These eleven shapes of surgical blade have become traditional — and international. Hospitals all over the world send to Sheffield for ever increasing supplies; so the model factory built to produce Swann-Morton blades is always expanding. But, however great the pressure of orders, there is never any relaxation of the individual care given to each individual blade.

Swann-Morton
SURGICAL BLADES AND HANDLES
3 TYPES OF HANDLE · 11 TRADITIONAL SHAPES OF BLADE



AGENT: Jagjivandas & Co., Keshav Bang, Princess Street, P.O. Box No. 2125, Bombay 2, India
W. R. SWANN & CO. LTD. SHEFFIELD 6 ENG LONDON OFFICE: 43 OXFORD RD. LONDON · W.1
100

EVANS
MEDICAL

HEPOVITE

for the treatment and prevention of 'Kwashiorkor'

Poverty and food prejudices make dietary protein deficiency commonplace throughout the tropics. In children and occasionally in adults such deficiency manifests itself as a group of closely related syndromes, collectively known as KWASHIORKOR. Typically this disease occurs in children aged 1 to 4 years who are on a high carbohydrate, low protein diet. One of the more consistent features of this disease is the severe liver damage which occurs, and which results in the ultimate fibrosis or necrosis of that organ. Consequently the supply of raw materials to the haemopoietic system is cut off. Hence macrocytic anaemia is a common finding in this disease. Treatment of patients seriously ill with the acute form of KWASHIORKOR is an urgent matter necessitating, among other measures, a high protein low residue diet supplemented with haemopoietic factors such as vitamin B₁₂ and folic acid. Experience has shown however, that purified vitamin preparations although

beneficial in the later stages of treatment can be harmful in the acute early phases.

All the more important dietary requirements for the treatment and prevention of KWASHIORKOR are supplied by HEPOVITE, a preparation of proteolysed liver especially rich in amino acids and containing adequate supplies of vitamin A, B complex, D, and of haemopoietic factors including vitamin B₁₂ and folic acid.

Good results in the treatment of this disease have been reported following doses of as little as 1½ g. daily.

DOSAGE

Children: 1 teaspoonful (3½g.) 3 times a day.

Infants: One half - teaspoonful (1½g.) 3 times a day.

PRESENTATION

HEPOVITE is supplied in hermetically sealed tins of about 140 g.

1. Thompson, F. A. (1954), Trans. Roy. Soc. Trop. Med. Hyg, 48, 150.

EVANS MEDICAL SUPPLIES (INDIA) LIMITED

P.O. Box 313
BOMBAY

P.O. Box 7834
CALCUTTA

P.O. Box 215
MADRAS

PERISTON "N"

**B
A
Y
E
R**

**»Bayer«
LEVERKUSEN
GERMANY**

**»BLOOD & TISSUE LAVAGE«
THE LATEST METHOD FOR
DETOXICATION OF THE SYSTEM**

Periston "N" adsorbs and eliminates toxins in infectious diseases. The Periston "N" molecules serve as a vehicle for poisons of various kinds to flush them out through the kidneys.

Available in infusion bottles of 100 cc.

Sole Importers in India :

CHOWGULE & CO., (HIND) LTD.

P. O. Box 1478, BOMBAY I
Branches: P. O. Box 8943, Calcutta 13
P. O. Box 1743, Madras I

WEG/35

"In all children who had been treated with Periston "N" in the preparalytic stage (poliomyelitis), no paralysis occurred. Meningeal symptoms retrogressed very rapidly."

J. Dieckhoff, (*Archiv für Kinderheilkunde*, 1952, 145, 137).

"The prognosis of tetanus is now, with the advent of Periston "N" treatment, much more favourable."

H. Mühlbauer, (*Munch. Med. Wochr.*, 1952, 49, 2486).

WANDER

Pantozyme

Polyvalent Enzyme Preparation
Containing
All digestive ferments
in highly activated form.
Active in acid as well as alkaline media.
Bottles of 30, 100 and 500 dragees.
Dr. A. WANDER S. A., BERNE-SWITZERLAND.

WANDER

WANDER

STOCKS ARE AVAILABLE
Sole Importers

KHATAU VALABHDAS & COMPANY
PHARMACEUTICAL DEPARTMENT.
Indian Globe Chambers, Fort Street, Bombay-1
BRANCHES AT: Patna, Delhi, Kanpur, Madras, Adoni,
Secunderabad (Dn.) and Bangalore City.



CONTROLLED TENSION

- A safe hypotensive of precise therapeutic value.
- Easily adjusted oral dosage.
- Relieves fatigue and tenseness, allays anxiety states, promotes feeling of well-being.
- No necessity for frequent blood pressure determination.
- No extreme sedative or unfavourable hypotensive action.
- No serious toxic reactions.
- Developed and clinically tested on millions of cases over a period of 21 years.
- Prescribed and sold all over the world.

Serpina

*The World's Pioneer
Rauwolfia Hypotensive & Cerebral Sedative.*

*Standardised 4 mg. Total Alkaloids of Rauwolfia
serpentina (Benth) per tablet.*

THE HIMALAYA DRUG CO. 251, Hornby Road, Bombay - 1.

Distributors for South India:

THE ORIENTAL MERCANTILE AGENCY, 90-A, Armenian St. Madras-1.

HD 55-1

Veriloid

*safest among
the potent
anti-hypertensives*

indications

Mild to severe essential and malignant hypertension. Initially, 3 mg. can be given orally three times a day, and subsequently increased by stages up to 15 mg. daily if necessary. The current administration of phenobarbitone widens the margin between the effective hypotensive and emetic doses of 'Veriloid', and also adds a degree of sedation. Intravenous and intramuscular solutions are available for use in acute hypertensive states, including eclampsia. Packs — 1 mg. (white) and 2 mg. (tinted yellow) tablets in bottles of 100 and 500. 'Veriloid'-VP (2 mg. 'Veriloid' and 15 mg. phenobarbitone) in the same sizes. 'Rauwiloid + Veriloid' tablets are also available.

'Veriloid', a product of Riker research, is an alkaloidal extract of *Veratrum viride*, and is biologically standardized to ensure uniform potency. This drug produces a definite and dependable hypotensive effect, and is indicated in the treatment of moderate to severe hypertension.

There is no ganglionic or adrenergic blockade, and postural reflexes are preserved, hence the activities of the patient are not unduly restricted. Overdosage is not to be feared, as the emetic effect of large doses acts as a safeguard.

RIKER

Detailed literature will be gladly sent on request.

MARTIN & HARRIS LTD.
Mercantile Buildings
1211 Bazar Street, Calcutta

VERILOID is a registered Trade Mark. Regd. Users:

RIKER LABORATORIES LIMITED
LOUGHBOROUGH LEICS. ENGLAND

SREEKAF

A palatable syrup of Bronchial Antiseptics, Expectorants, Anti-spasmodics and Sedatives

COMPOSITION:

Each fluid ounce of Sreekaf contains:

Potassium Sulpho Guaiacolate	.. 15 gr.
Ammonium Chloride	.. 3 gr.
Terpin Hydras	.. 1 gr.
Codein Phos.	.. 0.5 gr.
Ephedrine	.. 0.5 gr.
Antimony Tartarate	.. 0.06 gr.
Chloroform	.. 5 minims.
Syrup Tolu B.P.	.. 1 Fl. dr.
Syrup Scilla B.P.	.. 1 Fl. dr.
Syrup Calcii Hypophosphite	.. 1 Fl. dr.
Syrup Vasaka (I.P.L.) to	.. 1 Fl. oz.

Free Samples and Literatures on request to:

PRESCRIBED BY THE MEDICAL PROFESSION EVERYWHERE

For further particulars please write to
SREEVATSA CHEMICALS & DRUGS LIMITED,
166/169, Nyniappa Nalck St.,
MADRAS-3

LIVAFOLBIN

Two c.c. contains:
Liver Extract ... 50 grn.
Folic Acid ... 7.5 mg.
Vitamin B12 ... 25 mcg.

Indicated in:

Acute pernicious anemia, Macrocytic Anemias, Sprue

Subnormal growth in children is reported to respond to Vitamin B12. Increased appetite was noted in the patients treated and also for the functioning of bone marrow.

Dosage: To be injected intramuscularly 3 c.c. daily or alternate days as directed by the physician.

Packing: 2 c.c. amps and 10 c.c. & 30 c.c. R.O. phial

CALCIDOXON

(Calcium Gluconate with Vitamin C)

Five c. c. contains: Ten c. c. contains:
Calcium Gluconate 10% 10%
Vitamin C 100 mg. 200 mg.

Indicated in:

Pregnancy, lactation, periods of rapid growth, febrile conditions, old age convalescence and debility states, in Haemorrhagic & development of teeth and bones.

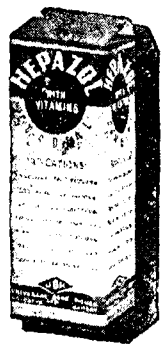
1 ampoule to be injected daily or alternate days intramuscularly or intravenously as directed by the physician.

MANDOSS DRUGS LTD
221/2, Strand Bank Road, CALCUTTA-1.

HEPAZOL CORDIAL

(with Vitamin B Complex)

The most effective combination of selected Indian herbs with Cholagogues & hepatic stimulants of modern B.P.—the inherent bitterness being masked by a special process—is liked equally by the children and fastidious patients and also the discriminating physicians. The addition of Vitamin B Complex has increased the therapeutic value to a great extent for the treatment of Liver troubles in the tropics.



METHIOZOL

With Methionine and Choline in addition to other ingredients of Hepazol cordial.

It is a unique combination, specially to combat Cirrhosis and Infantile Liver.

SYRUP OCIMEL

(Plain and with Codeine)

The outstanding feature of this COUGH SYRUP is the incorporation of OCIMUM SANCTUM (TULSI)

with OXYMEL (ORANGE HONEY from the Hills) besides other reputed Indian Indigenous Drugs & B.P. expectorants etc., and is better known as a never-failing medicament.

UNIVERSAL DRUG HOUSE LTD.,
10, Braunfeld Row, CALCUTTA-27

For Life Assurance

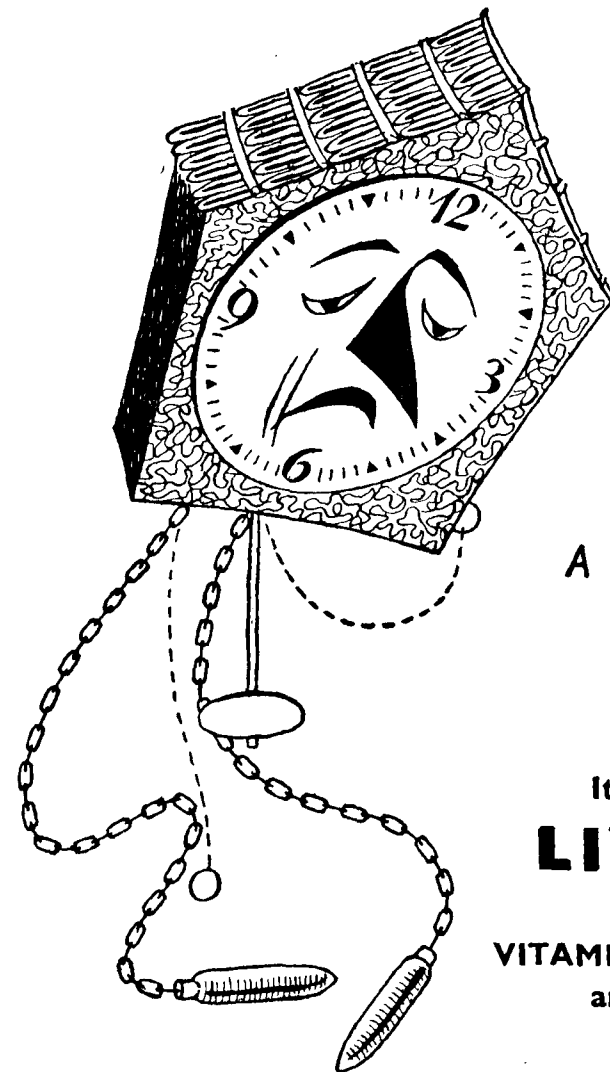
Consult

THE
NEW GUARDIAN
OF INDIA
LIFE INSURANCE CO., LTD.

Head Office:

"United India Life Building,"
Esplanade, MADRAS
(Estd. 1934)

An Ideal Insurance Company
to insure with or to represent



A RUN-DOWN
PATIENT?

It's time he had—

LIVOGEN

with

VITAMIN B COMPLEX
and **VITAMIN B₁₂**

Livogen contains in each fluid ounce the natural vitamin B complex derived from 4 oz. of fresh liver, and 2 oz. of fresh yeast, together with added vitamin B₁, nicotinic acid, and 25 micrograms of vitamin B₁₂.

Livogen is the rational tonic for all cases of debility, lassitude and nervous depression. It contains the essential metabolic 'activators' which create a lively interest in food, and restore natural vitality.

BRITISH DRUG HOUSES (INDIA) LTD.
P. O. Box 1341 BOMBAY I

Branches at: Calcutta - Delhi - Madras



hemolon

LIVER EXTRACT INJECTABLE (CRUDE)

COMPOSITION

Each c. c. represents Hemopoietic principles derived from 15 Grams of fresh liver and 10 mcg. of vitamin B₁₂

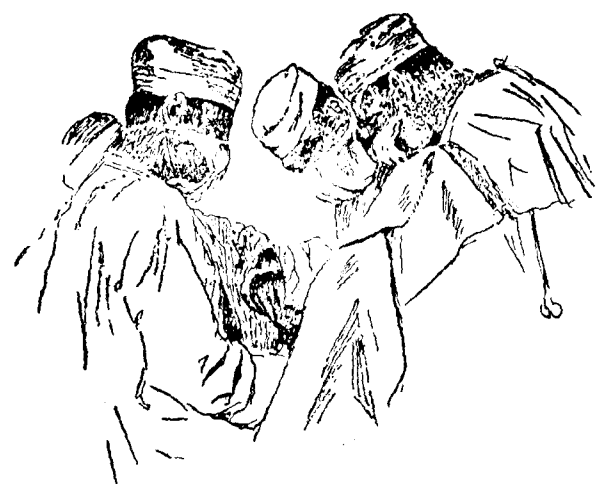
PACKING

Rubber-capped vials of 10 c.c.
Boxes of 6 x 2 c.c., 50 x 2 c.c. & 100 x 2 c.c. ampoules.

ALEMBIC CHEMICAL WORKS CO. LTD., BARODA-3.

YOU CAN PUT YOUR CONFIDENCE IN ALEMBIC





CHEMAPOL LTD

Sole Exporter of
**CZECHOSLOVAK
MEDICAMENTS.**

PELENTAN

Aethylum 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 ailments.

PSYCHOTON

Phenylisopropylaminum sulphuricum 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:

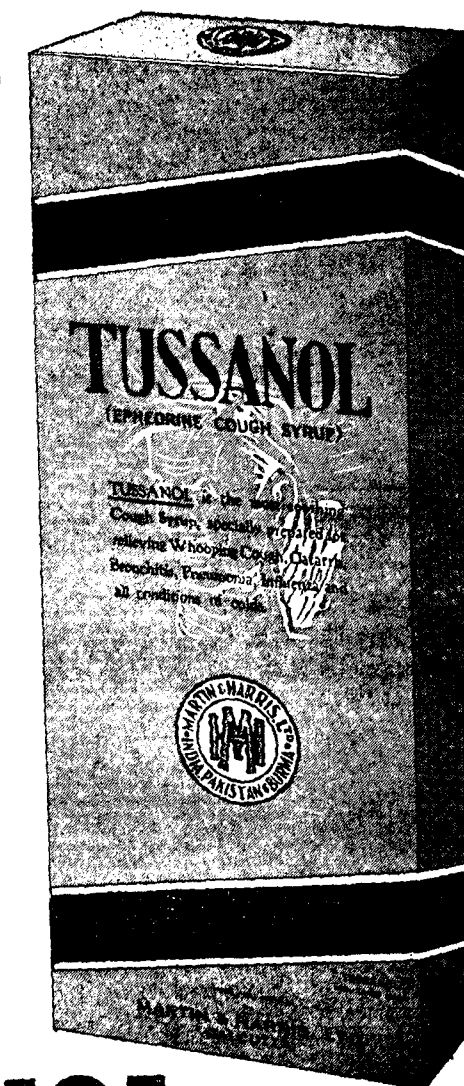
EZRA BROTHERS,
Mustafa Building, Sir Phirozshah Mehta Road,
FORT, BOMBAY.

CHEMAPOL LIMITED,
Company for the Import and Export of Chemical
Products and Raw Materials
PANSKA 9, PRAHA II, CZECHOSLOVAKIA



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

IN DRUGS & MEDICINES—NO. 3

Prescribe
PYRAMID Glycerin
for skin disorders!

None of the new drugs discovered of recent years is a satisfactory substitute for Glycerin. Glycerin's unique qualities make it of basic importance in medicine, and there is no substitute.

Glycerin is a HUMECTANT

By absorbing moisture from the air Glycerin keeps the area it is put on from drying. It is, therefore, an excellent emollient and very valuable in ointments.

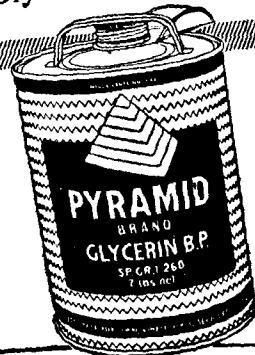
Glycerin is an ANTISEPTIC

When applied on an infected area Glycerin dehydrates the present organisms (bacteria) thus acting as an effective antiseptic.

• • • • •
• A simple but very effective •
• prescription for chapped •
• hands and lips, for dry •
• rough skin and for condi- •
• tions like Eczema or Herpes •
• where an emollient is indi- •
• cated: •
• **Rx** •
• Glycerin 2 dr. •
• Aqua Rose 2 dr. •
• • • • •

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!

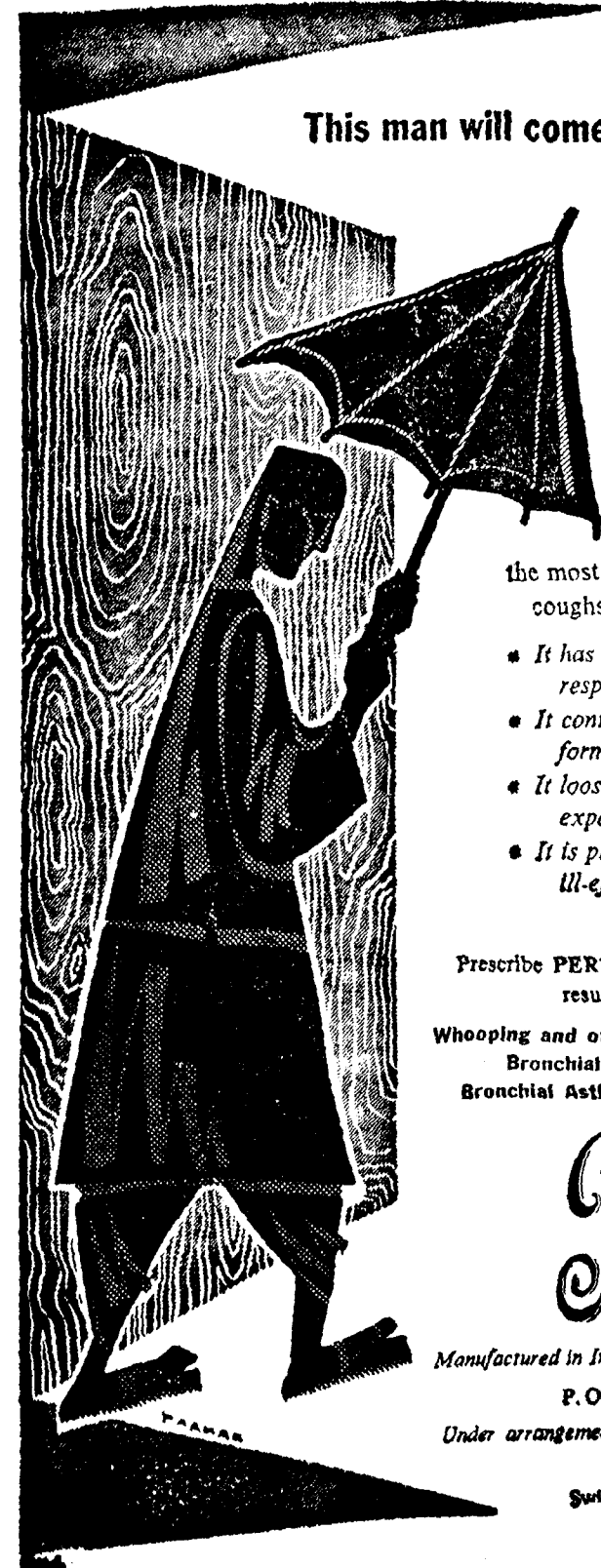
Also available in 28 lb., 56 lb., 1 cwt.,
5 cwt. & 10 cwt. drums.

EFFICIENT • PURE • CHEAP

PYG. 3A-25

MANUFACTURED BY LEVER BROTHERS (INDIA) LTD., P.O. BOX 491, BOMBAY, L.

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—

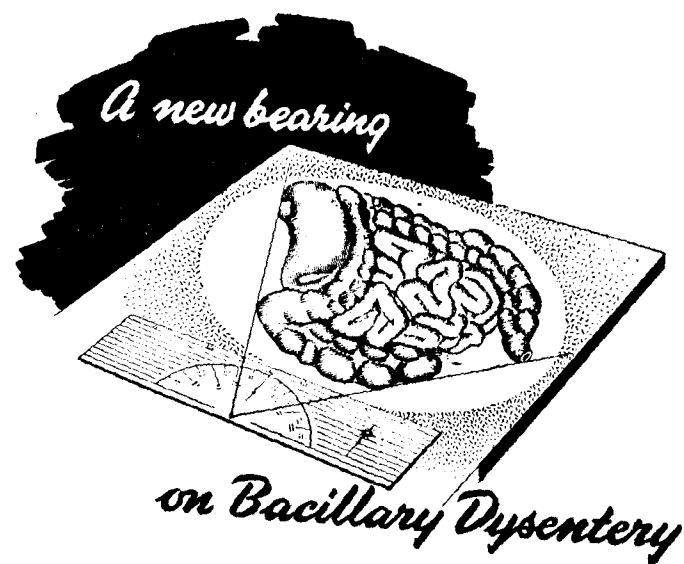
- It has an antiseptic action on the respiratory tract
- It contains no narcotics, chloroform or creosote
- It loosens phlegm and makes expectoration easy
- It is pleasant-tasting and has no ill-effects on digestion

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



Emphasis has been given recently to the use of combined chemotherapy in infections and to the merit of the judicious combination of antibiotics and sulphonamides in the prevention of bacterial resistance.

In the treatment of many infections of the gastro-intestinal tract, combined therapy with streptomycin and sulphaguanidine is a distinct advance on previous forms of treatment.

Guanimycin, in which oral streptomycin sulphate is combined with sulphaguanidine, is indicated in the treatment of bacillary dysentery, gastro-enteritis, salmonella food poisoning and other mixed infections of the gastro-intestinal tract in infants, children and adults.

Guanimycin is issued as a free-flowing powder from which a smooth, palatable homogeneous suspension may be made by simple mixture with water.

GUANIMYCIN

ORAL STREPTOMYCIN SULPHATE with SULPHAGUANIDINE Trade Mark

In bottles to prepare 4 fluid ounces.

Literature on application.

ALLEN & HANBURYS LTD
(INCORPORATED IN ENGLAND)
CALCUTTA BOMBAY

a radical departure
in PARASITOLOGY

HETRAZAN

DIETHYLCARBAMAZINE



A product of long Lederle research, HETRAZAN differs from other parasitocides in that it does not contain any toxic metallic elements.

Highly specific for certain parasites, including *Wuchereria bancrofti* and *Onchocerca volvulus*, HETRAZAN is indicated for the treatment of filariasis and ascariasis, particularly when due to *Ascaris lumbricoides*.

PACKAGES:

• syrup—bottles of 4 fl. oz. — 30 mg. per cc.

• tablets—bottles of 30, 100 and 1,000—50 mg. each

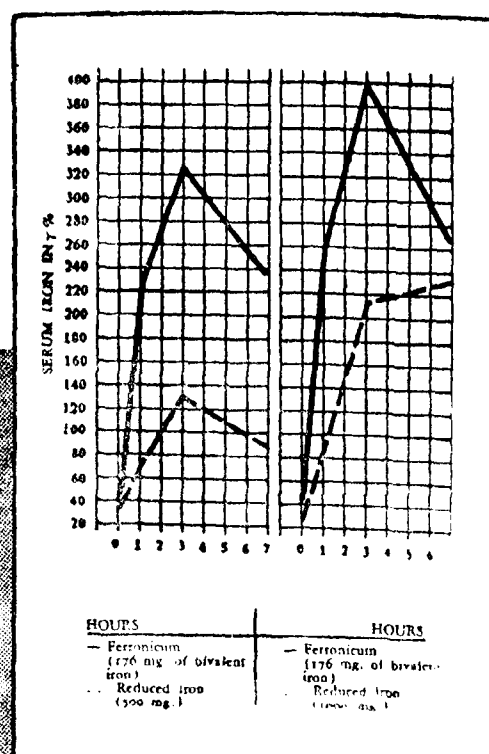


• Trade Mark

LEDERLE LABORATORIES (INDIA) LTD., P. O. B. 1994, BOMBAY I.

*In Iron Deficiency
Anaemia . . .*

Ferronicum



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

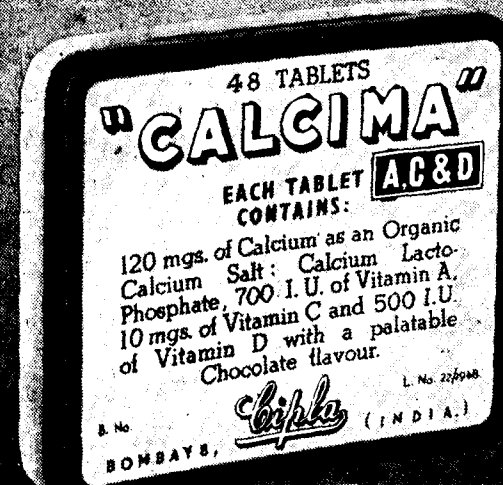
The graph shows the better absorption of Ferronicum as compared to reduced iron. Small oral doses of Ferronicum increase the serum iron level far more than large doses of reduced iron (average from 5 patients). (Jasinsky, Schu. Med. Wschr., 30, 59, 1950)



SANDOZ LTD. BASLE (SWITZERLAND)

CALCIMA-ACD

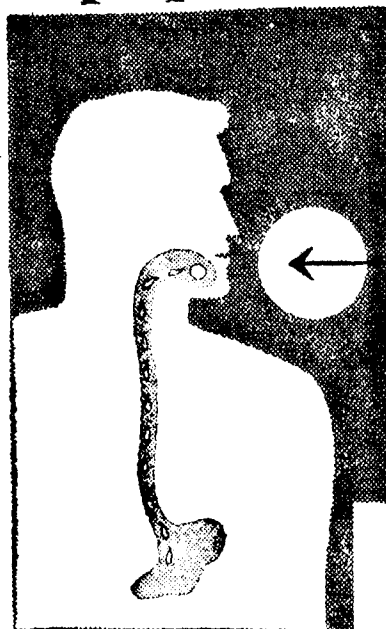
Cipla



CALCIUM TABLETS WITH VITAMINS
A. 700 I.U., C. 10 mgs., D. 500 I.U.

Cipla Sales Depot: 1/186, Mount Road, Madras

The key to successful peptic ulcer therapy



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

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

Dosage

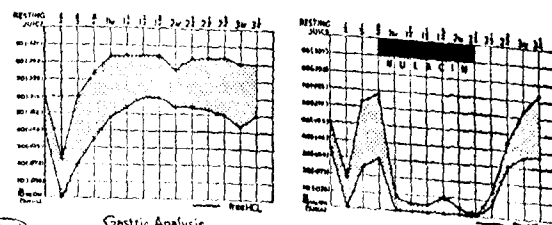
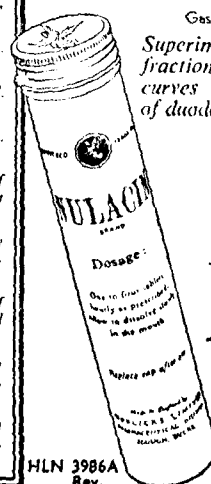
Beginning half-an-hour after food a NULACIN TABLET should be placed in the mouth and allowed to dissolve slowly.

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

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

REFERENCES

- Medical Treatment of Peptic Ulcer, Med. Press, 27th Feb., 1952, 227: 195
 The Control of Gastric Acidity, Brit. Med. J., 26th July, 1952, 2: 180
 Notes on Remedial Agents, Med. Review, Sept., 1952, 46: 162
 Discussion on Peptic Ulceration, Proc. Roy. Soc. Med., May, 1953, 46: 354
 The Effect on Gastric Acidity of "Nulacin" Tabs., Med. J. Aust., 28th Nov., 1953, 2: 823
 Control of Gastric Acidity by a new way of Antacid Administration, J. Lab. Clin. Med., Dec., 1953, 42: 955
 Further Studies on the Reduction of Gastric Acidity, Brit. Med. J., 23rd Jan., 1954, 1: 183
 Clinical Investigation into the Action of Antacids, Practitioner, July, 1954, 173: 46
 Management of Peptic Ulceration in General Practice, Med. World, Dec., 1954, 2: 591



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

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

NULACIN

HORLICKS LIMITED

4 Mission Row (P.O. Box 2229)

CALCUTTA

HLN 3986A
Rev.



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

ANACIN

ANALGESIC TABLETS

* Trade Mark

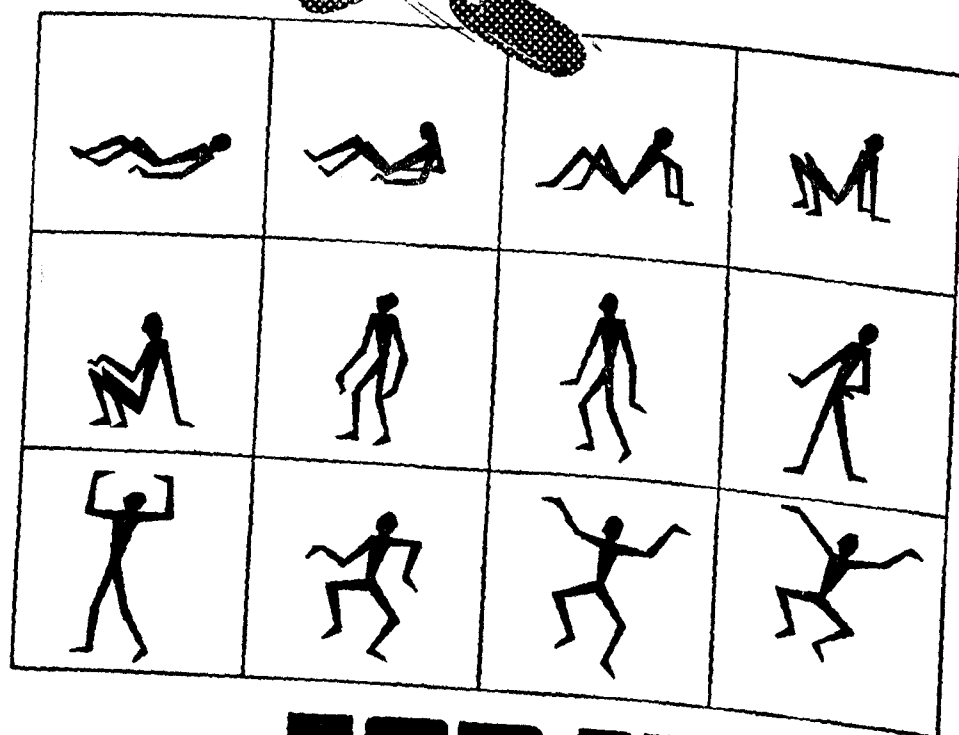
In piller-proof containers of 32 tablets and packets of 2 tablets each.

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

as in
 HEADACHE
 TOOTHACHE
 MUSCLE PAIN
 NEURALGIA
 NEURITIS
 DYSMENORRHOEA
 INFLUENZA



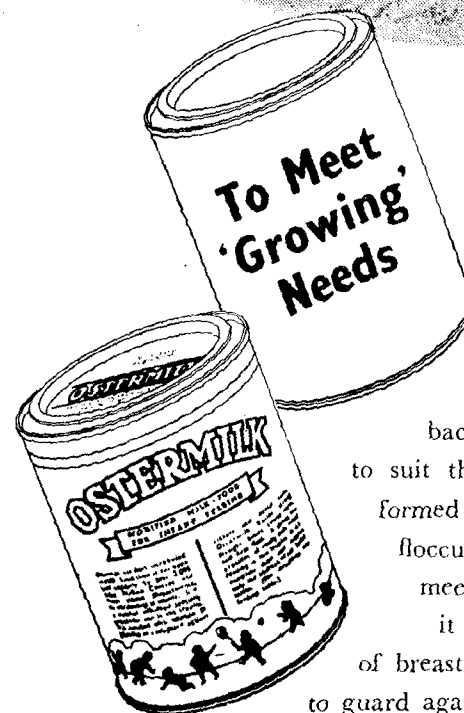
*Put new Life
into your Patient*



ESDAVITE
MULTIVITAMIN CAPSULES®

**SHARP
& DOHME**

SOLE DISTRIBUTORS
VOLTAS LIMITED
SUCCESSORS TO THE ENGINEERING & IMPORT DIVISION OF
VOLKART BROTHERS
BOMBAY, CALCUTTA, COCHIN, NEW DELHI, MADRAS, KANPUR
Scientific Literature from Bombay, Post Box 900



As a supplement to breast milk or as a complete replacement, Ostermilk has set the highest standards of *safety, digestibility and nutritional value*. Its rich clean milk dried on heated rollers is free from all pathogenic bacteria. Ostermilk is specially prepared to suit the baby's digestive capacity; the curd formed in the baby's stomach is light and flocculent like that of breast milk. Ostermilk meets the 'growing' needs of the baby—it contains all the essential constituents of breast milk plus extra vitamin D and iron to guard against rickets and nutritional anaemias.

OSTERMILK

—the modified milk-food for infant feeding
(In 1 lb. and 2 lbs. tins)

P. O. BOX 202, BOMBAY I • P. O. BOX 2257, CALCUTTA I • P. O. BOX 108, MADRAS I



IRON AND MOTHERHOOD

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

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

Plastules*

Wyeth

Available in four combinations

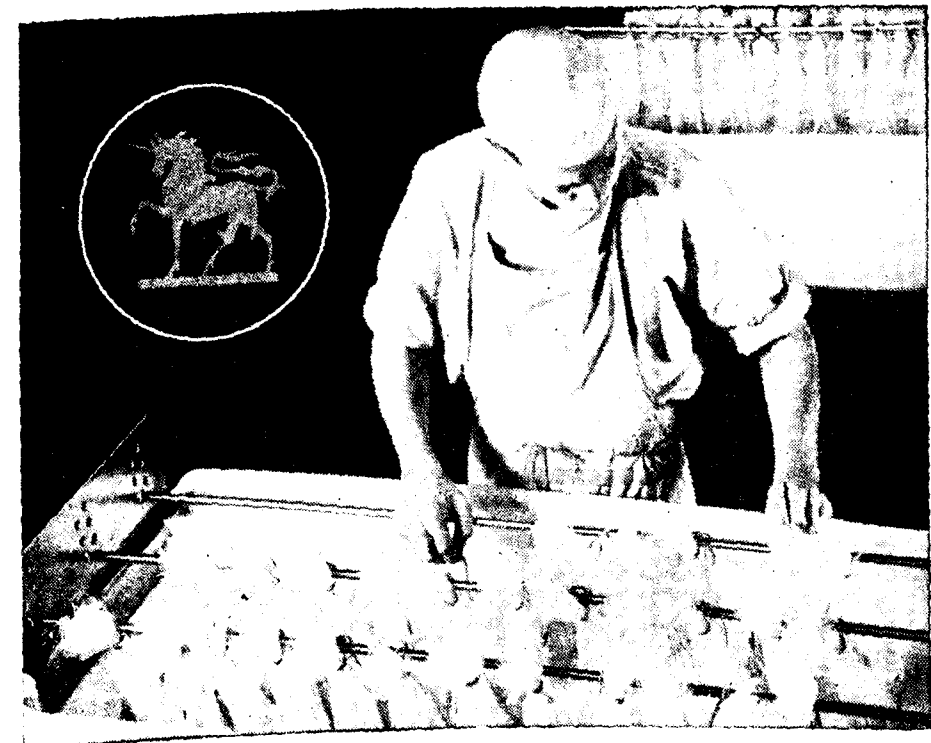
- * Plain
- * Liver Extract
- * Liver and Folic Acid
- * Liver, Folic Acid and Vitamin B₁₂

Packing: Bottles of 30 and 300 capsules

JOHN WYETH & BROTHER LIMITED, LONDON

India Branch: Magnet House, Dougall Road, Bombay 1
Distributors in India: GEOFFREY MANNERS & CO. LTD.
Bombay ★ Calcutta ★ Madras ★ New Delhi

• Trade Mark



A stage in the purification of Refined Antitoxin Sera: dialysis

a matter of refinement

The effectiveness of antitoxic sera is dependent, to a large extent, on the methods used in manufacture. Enzyme refinement removes inactive protein and reduces the size of the molecule. As a result, serum reactions are much reduced while therapeutic efficiency is completely retained. This method, which was evolved in The Wellcome Research Laboratories, is used for all 'Wellcome' Antitoxic Sera for human use, and has replaced the older and less satisfactory ammonium sulphate method. The following 'Wellcome' Antitoxic Sera are available: Diphtheria, Gas Gangrene (Perfringens), Mixed Gas Gangrene and Tetanus.

Wellcome BRAND

REFINED ANTITOXIC SERA

PREPARED AT THE WELLCOME RESEARCH LABORATORIES, ENGLAND



SUPPLIED BY
BURROUGHS WELLCOME & CO. (INDIA) LTD., BOMBAY

*Improved outlook
in hypertension with*

'ANSOLYSEN'

trade mark PENTOLINUM TARTRATE brand

The new **M&B** brand ganglion-blocking agent

- (1) Effective in a high percentage of cases when given orally
- (2) Full control of blood pressure possible at low dosage
- (3) Prolonged action

Supplies:

40 mgm. tablets, and as a 0.5% solution, for injection.

AN **M&B** brand MEDICAL PRODUCT

*Detailed literature
is available on request*

Manufactured by



MAY & BAKER LTD

Distributed by: MAY & BAKER (INDIA) LTD

BOMBAY · CALCUTTA · GAUHATI · MADRAS · NEW DELHI

MA1481 37

ALVITE

*For
Multivitamin therapy*

ALVITE, available in liquid and capsule form, is a multivitamin preparation of high potency, containing all the principal vitamins in proper strengths and well-balanced proportions.

COMPOSITION

	ALVITE LIQUID Each c.c. contains:-	ALVITE CAPSULES Each capsule contains:-
Vitamin A	7500 I.U.	5000 I.U.
Vitamin D	1500 I.U.	1000 I.U.
Vitamin B ₁ B.P.	1.5 mg.	3.0 mg.
Vitamin B ₂ B.P.	1.0 mg.	2.0 mg.
Vitamin B ₆ B.P.C.	1.5 mg.	1.0 mg.
Calcium Pantothenate U.S.P.	3.0 mg.	3.0 mg.
Niacinamide B.P.	10.0 mg.	25.0 mg.
Vitamin C B.P.	75.0 mg.	75.0 mg.
Wheat Germ Oil	—	3.0 mg.
Choline Dihydrogen Citrate	—	3.0 mg.

PACKING

ALVITE LIQUID:
Bottles of 15 c.c. with a dropper.

ALVITE CAPSULES:
Bottles of 25, 100 and 1000 capsules.

Alembic

ALEMBIC CHEMICAL WORKS CO. LTD., BARODA-3.

YOU CAN PUT YOUR CONFIDENCE IN ALEMBIC

EVEREST MP-54.9

IN PREGNANCY

AND LACTATION

OSTOCALCIUM

When your patients need calcium, Ostocalcium is suitable in every sense. It provides readily assimilable form of calcium with adequate vitamin D to promote maximum absorption and utilisation of the mineral. Its pleasant flavour is acceptable to adults and children and ensures that the prescribed course will be taken. Ostocalcium meets the extra demands for calcium in pregnancy and lactation and helps the growth of bones and teeth of the young.



OSTOCALCIUM TABLETS

IN BOTTLES OF 50 AND 250

GLAXO

GLAXO LABORATORIES (INDIA) LTD.,

BOMBAY

CALCUTTA

MADRAS



ONE WEEK'S THERAPY
for the peptic ULCER patient

	BREAKFAST followed in $\frac{1}{2}$ hr. to 1 hr. by	'ALUDROX' 2 teaspoonfuls
	MID-MORNING	'SEBELLA' 2 tablets
	LUNCH followed in 1 hour by	'ALUDROX' 2 teaspoonfuls
	MID-AFTERNOON	'SEBELLA' 2 tablets
	SUPPER followed in 1 hour by	'SEBELLA' 2 tablets
	BEDTIME	'ALUDROX' 4 teaspoonfuls

This dosage may be increased wherever necessary. After one week's combined 'Aludrox'/'Sebella' therapy, 1 'Sebella' Tablet t. i. d. will usually suffice.

'ALUDROX'* **'SEBELLA'***

AMPHOTERIC GEL
Available in bottles of 12 fl. oz.
'Aludrox' Tablets in bottles of 60.



TABLETS
Available in bottles
of 60 tablets

* TRADE MARK

JOHN WYETH & BROTHER LIMITED, LONDON

India Branch: Magnet House, Dougall Road, Bombay 1

Distributors: GEOFFREY MANNERS & CO. LTD., Bombay Calcutta Madras • New Delhi

Really effective treatment
for **ROUNDWORM**
and **THREADWORM**

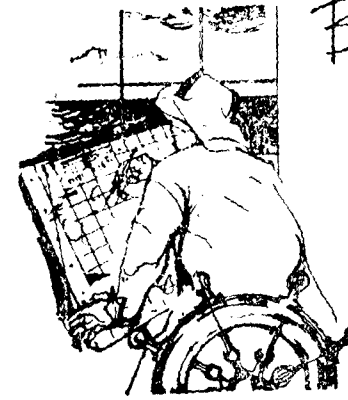
As a result of investigations at The Wellcome Laboratories of Tropical Medicine, 'Antepar' brand Elixir is now offered as a major advance in the treatment of ascariasis and oxyuriasis. Piperazine, the active ingredient of 'Antepar', has proved to be far more efficient than any of the traditional ascaricides and oxyuricides, yet virtually non-toxic. In two independent clinical trials on ascariasis a 100 per cent cure rate was obtained and in oxyuriasis a 97 per cent cure rate. No important side-effects were observed. 'Antepar' is pleasantly flavoured and readily acceptable to small children. It contains 500 mgm. of piperazine per fluid drachm, and is available in bottles of 1 fl. oz. and 3 fl. oz.

- Outstanding Efficacy
- Rapid and complete cure
- No important side-effects
- Simply Administered
- Pleasantly Flavoured
- No special routine needed

'Antepar' ELIXIR



BURROUGHS WELLCOME & CO. (INDIA) LTD.
P. O. Box No. 290, BOMBAY

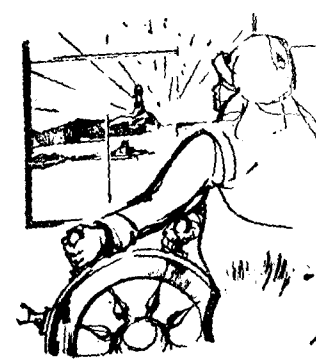


Both discovered by **Pfizer**

consider the
promise
of **Tetracycline***

newest broad-spectrum antibiotic

Tetracycline will be made available in a variety of convenient dosage forms very shortly.



consider the
proof
of **Terramycin***

unexcelled broad-spectrum antibiotic

whatever the clinical condition... whatever your therapeutic preference... there is a Pfizer agent for every antimicrobial indication

TERRAMYCIN
(brand of oxytetracycline)
Combiotic*
Cotiazin*
Dihydrostreptomycin
Penicillin
Polymyxin
Pronapen*
Streptomycin
Streptohydrazid*
Viocin*

TETRACYCIN
(brand of tetracycline)



PFIZER EASTERN CORPORATION, New York

Exclusive Distributors in India:

RAVISON PHARMACEUTICALS LTD.

P. O. Bag No. 10020, Bombay 1. 'Grams': 'RAVIPHARM'

TRADEMARK OF CHAS. PFIZER & CO., INC.

World's Largest Producers of Antibiotics

VITAMIN-MINERAL FORMULATIONS

HORMONES

... 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 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 every case in which salt is not permitted. Experience proves that when the patient is deprived of salt its lack soon shows itself, sometimes by mental disturbances, or otherwise the patient soon develops adverse symptoms. These therefore may readily be avoided by ordering RUTHMOL which, in our opinion, has maintained its reputation ever since it was first put upon the market.

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

Sole Agents in INDIA
THE ANGLO-THAI CORPORATION LTD.

Sole Distributors
HERBERTSONS LTD.

Ewart House,
 Bruce Street, Fort,
 BOMBAY 1.

Nathoolaji's Bldg.,
 67-A Kings Way,
 SECUNDERABAD (Dn.)

1, Daryaganj,
 Ansari Road,
 DELHI.

Stephen House,
 5, Dalhousie Sq.,
 CALCUTTA.

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

FORMULAE:
 INGREDIENTS
 Potassium Chloride 55.6%
 Potassium Glutamate 2%
 Inert excipients & Flavouring 44.2%

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. ✓

Sole Agents in INDIA
THE ANGLO-THAI CORPORATION LTD.

Sole Distributors
HERBERTSONS LTD.

Ewart House,
 Bruce Street, Fort,
 BOMBAY 1.

Nathoolaji's Bldg.,
 67-A Kings Way,
 SECUNDERABAD (Dn.)

1, Daryaganj,
 Ansari Road,
 DELHI.

Stephen House,
 5, Dalhousie Sq.,
 CALCUTTA.

Speedy
OXOID
 BRAND

FER-G-NATE TABLETS & SYRUP

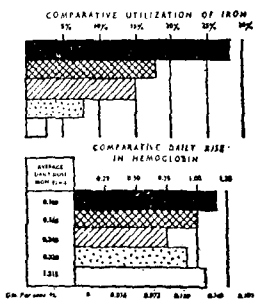
FERROUS GLUCONATE FOR IRON DEFICIENCY ANÆMIAS

each (Sugar-coated) Tablet Contains:
 • Ferrous Gluconate 200 mg.
 Also available with
 • Cobalt Gluconate Per Tab. 7.5 mg.

Each 100 c.c. of Syrup represents:
 • Ferrous Gluconate 3.9 gm.
 • Cobalt Gluconate 290 mg.
 • Copper Sulphate 1.5 mg.
 • Manganese Hypophosphite 1.5 mg.
 Vitamin B1 32 mg.
 Syrup, Flavour etc. q.s.

GRAPHICAL REPRESENTATION SHOWING COMPARATIVE EFFICACY
FERROUS GLUCONATE

FERROUS GLUCONATE
 FERROUS CHLORIDE
 FERROUS SULFATE
 FERROUS CARBONATE
 IRON AND AMMONIUM CITRATE



CHEMICALS MANUFACTURED IN COMPANY'S LABORATORY.

EFFICIENT IRON UTILISATION WITH LESS GASTRO INTESTINAL DISTRESS.



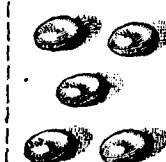
Literatures from
THE SANITEX CHEMICAL INDUSTRIES LTD.
 INDUSTRIAL ROAD, BARODA 3.

MERSALYL

*Preferably
 B.D.H.*



Injection solutions, containing Mersalyl B.P. with Theophylline B.P., which remain clear and colourless throughout reasonable periods of storage.



Tablets containing Mersalyl B.P. with Theophylline B.P. of precise weight, good shape and colour and of correct density for easy disintegration.



Every physician's bag should contain a reliable diuretic. Check over the contents of your bag and ensure that a box of Mersalyl B.D.H. is available for emergency use.

THE BRITISH DRUG HOUSES LTD., LONDON

Representatives in India: **BRITISH DRUG HOUSES (INDIA) LTD.**
 P.O. Box 1341, Bombay - P.O. Box 9024, Calcutta - P.O. Box 1150, Delhi - 99 Nynappa Naick St., Madras



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 soft 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).

WU 3

RAMTIRTH BRAHMI OIL

SPECIAL No. 1

(Registered Ayurvedic Preparation)

INDICATED IN
BALDNESS
IMPROVES
EYESIGHT
IMPARTS
SOUND SLEEP



STOPS FALLING
HAIR,
USEFUL TO
EVERYBODY
IN ALL
SEASONS

Rs. 3/8/- Big Bottle — Rs. 2/- Small Bottle
(Sold everywhere)

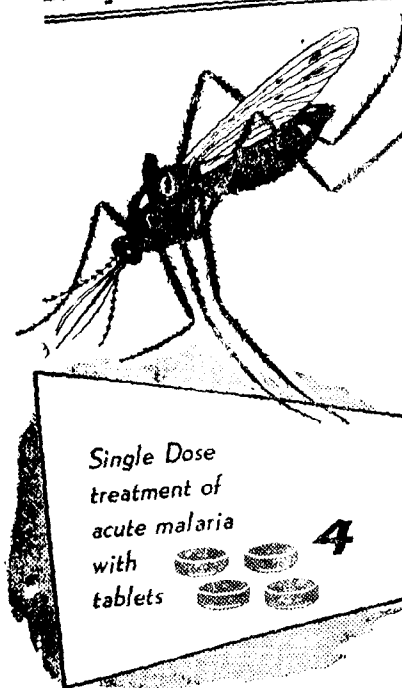
SRI RAMTIRTH YOGASHRAM

Phone : 62899

Dadar — BOMBAY-14

Grams: PRANAYAM

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. 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)



In the treatment & suppression of
MALARIA
Acute & Chronic

CHLOROQUIN B.I.

(Chloroquine Diphosphate)

Four tablets, in a single dose, cuts short the acute attack promptly, while as a suppressive agent, weekly two tablets will suffice.

Also specific in HEPATIC
AMOEBIASIS

Available in 0.25 gm. tablets.

BENGAL IMMUNITY CO., LTD.
153, DHARAMTALA STREET, CALCUTTA.



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 hydrolysed, 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



BEC-9157 (A)

ESTROPROGYN in Amenorrhoea

Estradiol Benzoate - 2.5 mg.
Progesterone - 25 mg. per c.c. of
Sesame Oil with 1.5% Benzyl
Alcohol.

*Effective
Hormones
Therapy*

UNI-TRI-STERON

For Dysfunctional Bleedings

Progesterone... 25 mg.
Estradiol Benzoate... 2.5mg.
Testosterone... 25 mg.
per 2 c.c. on oily base

**UNICHEM LABORATORIES
BOMBAY 26.**



To Normalise **MENSTRUAL ABNORMALITIES**

OF VARIOUS KINDS FROM
FUNCTIONAL & GLANDULAR
DISORDERS

Re **HORMOSOKA**

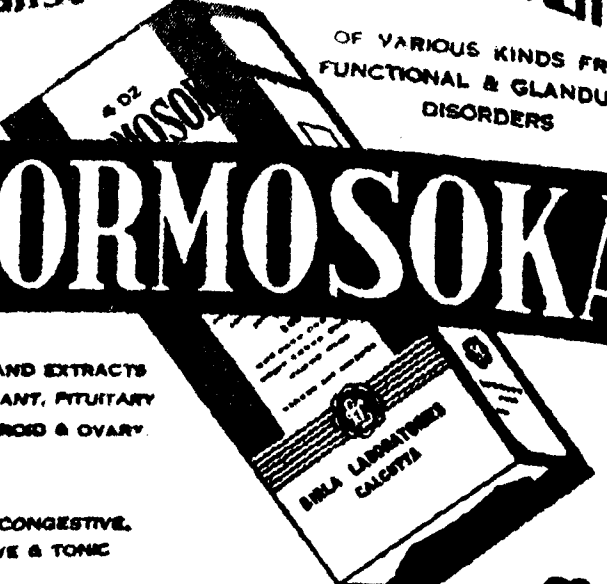
Contains
ASOKA

GLAND EXTRACTS
OF ANT. PITUITARY
THYROID & OVARY

**PERFECT
CYCLE**

VEGETABLE LAXATIVE, DECONGESTIVE,
ANTISPASMODIC, SEDATIVE & TONIC

BIRLA LABORATORIES, CALCUTTA




PINOCIDE SYRUP

(A palatable syrup containing piperazine citrate)

For threadworm, roundworm and hookworm

- ADVANTAGES**
- No dieting, purging or enemas required.
 - No side effects in normal doses.
 - Effective in both adults and children.
 - Palatability ensures regular dosage.

PACKS: Bottles of 1½ oz. and 3½ oz. • Detailed literature on request

SMITH STANISTREET & CO., LTD.

CALCUTTA • BOMBAY • MADRAS • KANPUR • PATNA • GAUHATI • NAGPUR

PSST 2

SANIMALT
PALATABLE DIETARY SUPPLEMENT

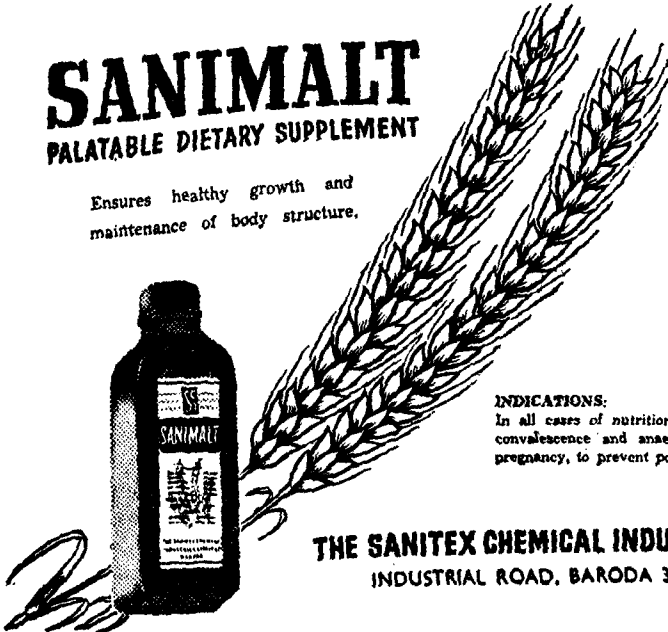
Ensures healthy growth and
maintenance of body structure.

Each Fl. Oz. of Sanimalt provides:

Vitamin A	20,000 I.U.
Vitamin D	4,000 I.U.
Thiamin Hydrochloride (B ₁)	5 mg.
Riboflavin (B ₂)	1 mg.
Nicotinic Acid Amide	25 mg.
Pyridoxine Hydrochloride (B ₆)	1 mg.
Calcium Pantothenate	250 mg.
Calcium Glycerophosphate	250 mg.
Sodium Glycerophosphate	250 mg.
Ferrous Gluconate	245 mg.
Malt and Flavour	Q.S.

INDICATIONS:
In all cases of nutritional deficiency, general debility, convalescence and anaemias, and particularly during pregnancy, to prevent polyneuritis.

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





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

Each Tablet Contains:

Aminophylline	1 gr.
Phenobarbital	1/6 gr.
Papaverine Hydrochloride	1/6 gr.
Base	q.s.

FORTE

Each Tablet Contains:

Aminophylline	1 1/2 gr.
Phenobarbital	2 gr.
Papaverine Hydrochloride	1/2 gr.
Base	q.s.

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

A product of

PRIMCO LIMITED,

Lamington Chambers, Lamington Road, BOMBAY 4.

WHOOPIING COUGH?

PRESCRIBE

PENTAKOS!

- * 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 correct this chemical change and eliminate the spasms.
- * QUICK and ECONOMICAL treatment for WHOOPING COUGH.

References: 1. Whooping Cough a problem—*Medical Digest*, Vol. 21, No. 11, Nov. 1953.
2. Acidifying Drugs in Whooping Cough *Special Therapeutic Number*, *Indian Medical Review*.

Literature from:

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

M/s. UNIQUE PHARMACEUTICALS,
219, POONAMALLEE HIGH ROAD, MADRAS-7.
SAHIB SINGH AGENCIES LTD.,
Connaught Place, NEW DELHI.

BHOOPUR CO.,
87, CHOWRINGHEE ROAD, CALCUTTA.
NEW INDIA MEDICAL STORES,
BIRHANNA ROAD, KANPUR.

For treatment of HYPERTENSION

RUMANOL with VERATRUM VIRIDE

is still the medicament of
CHOICE

In the dosage required to lower blood pressure, Veratrum Viride does not affect cardiac rate, respiration or temperature. In controlled cases, within therapeutic limits, no severe toxic effects have been noted.

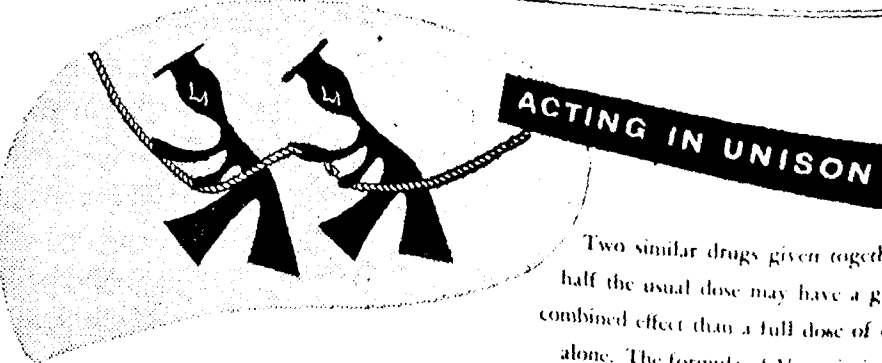
With proper study of Patient reaction and adjustment of dosage until the optimum schedule is determined, headache and malaise are quickly dispersed, giving rise to a sense of well being in the Patient. This subjective improvement usually precedes a significant fall of blood pressure.

Literature from:

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

M/s. UNIQUE PHARMACEUTICALS,
219, POONAMALLEE HIGH ROAD, MADRAS-7.
SAHIB SINGH AGENCIES LTD.,
Connaught Place, NEW DELHI.

BHOOPUR CO.,
87, CHOWRINGHEE ROAD, CALCUTTA.
NEW INDIA MEDICAL STORES,
BIRHANNA ROAD, KANPUR.



ACTING IN UNISON

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.

VEGANIN
No Warner preparation has ever been advertised to the public.

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

PACKING:
Tablets of 10 and 20 tablets.

PREPARED BY
WILLIAM R. WARNER & CO. LTD.,
London, England.

Distributors
MARTIN & HARRIS LTD.,
Mercantile Buildings, Lill Bazar, Calcutta.
Also at Bombay, Madras and Delhi.

WH 8

RYBARVIN INHALANT for ASTHMA

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



Manufactured in England by
RYBAR LABORATORIES LTD.

ASK FOR LITERATURE FROM:-
Sole Distributors for India
H. MUKERJI & BANERJEE SURGICAL LTD.
39/1, COLLEGE STREET, CALCUTTA-12
and at ASUTOSH BLDG., CAL. UNIVERSITY

Sole Stockists for Bombay & Saurashtra
KEMP & CO., LTD.
88C, OLD PARSHADEVI ROAD, BOMBAY-20

Sole Stockists for South India
SPENCER & CO., LTD.
MOUNT ROAD, MADRAS-2

Sole Stockists for Delhi & East Punjab
BHAGWAN DAS & CO.
CHANDNI CHOWK, DELHI

Specialities

GLUCOSE B.
(For Scientific Glucose Therapy)

TRIPLE DYE.
(For burns, cuts, etc.)

CALAMINOL.
(Efficacious in Eczema)

DERMOTAR.
(For dry Eczema)

EPHYTOL.
(Oint. & Paint for Ringworm)

SCARICIDOL.
(For scabies and pediculosis)

SOLU-RESORCINOL.
(An ideal hair tonic)

PEP-DIASTASE.
(For disorder of bowels due to indigestion)

CASTELLANT'S PAINT
(For mangoes, athlete's foot etc.)

THIOTAR.
Tinea versicolor, Seborrheic
lichen, psoriasis, etc.

KERASOL.—(Corn Cure)

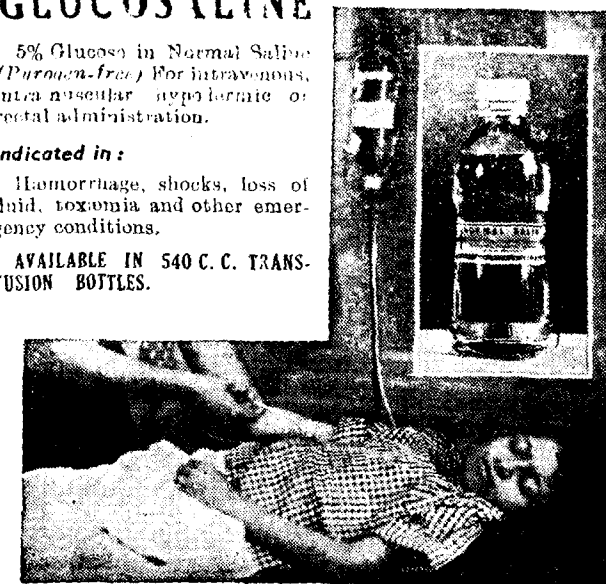
GLUCOSALINE

5% Glucose in Normal Saline
(Paraben-free) For intravenous,
intra-arterial, hypodermic or
rectal administration.

Indicated in:

Hæmorrhage, shocks, loss of
fluid, toxæmia and other emer-
gency conditions.

AVAILABLE IN 540 C.C. TRANS-
FUSION BOTTLES.



Phone: 34-2674.

Gram: "PASLAB"

PASTEUR LABORATORIES LTD.,
2, Cornwallis Street, CALCUTTA-6.

OPIL

METHIOCHOLINE

'OPIL'

For Intramuscular Use

Each cc. contains:

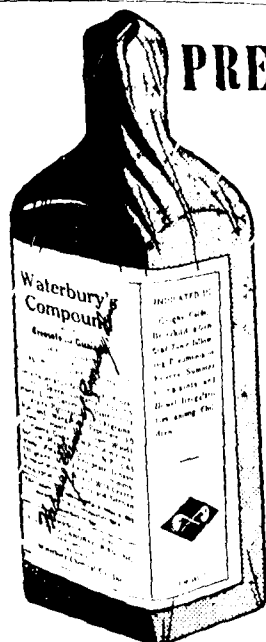
Methionine	...	...	25 mg.
Choline Chloride	...	...	100 mg.
Inositol	...	...	50 mg.
Betaine Hydrochloride	...	...	10 mg.
Vitamin B ₁₂	...	...	5 mcg.
Benzyl Alcohol	...	...	3 %
Preservative Phenol	...	...	0.5 %

Indications:

It is indicated in liver disorders, hypercholesterolemia, coronary diseases, atherosclerosis, alcoholism, nephrosis, hypertension. It helps to normalise cholesterol and fat metabolism; it prevents deposition of cholesterol in the intima of blood vessels; in liver diseases it helps to increase phospholipid formation, reduces fatty deposits and stimulates regeneration of liver cells.

Vials of 10 cc.

ORIENTAL PHARMACEUTICAL INDUSTRIES LIMITED,
64-66, Tulsipipe Road, Mahim, BOMBAY-16



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

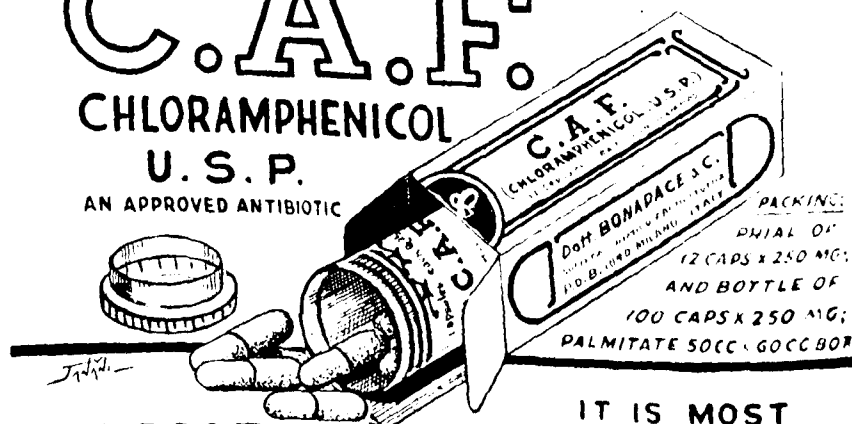
MARTIN & HARRIS LTD.
Mercantile Buildings, Lall Bazar, Calcutta. Also at Bombay, Madras and Delhi
Made in England by VINCE LABORATORIES Ltd., London, W. 1

WIC-1

C.A.F.

CHLORAMPHENICOL
U.S.P.

AN APPROVED ANTIBIOTIC



IT IS MOST
RELIABLE and ECONOMICAL
IN THE TREATMENT OF VARIOUS BACTERIAL INFECTIONS.
LITERATURE ON REQUISITION

SOLE IMPORTERS
FOR INDIA: **AMARCHAND SOBACHAND,** POST BOX NO. 518, MADRAS-3.

STOCKISTS: 1. M/s. NATH & CO., Princess St., Bombay-3
2. M/s. MEDICINE TRADERS, Chandel Chowk, Delhi-6
3. M/s. PREMIER MEDICAL SUPPLIES & STORES, 44/45, Ezra St., Calcutta-1

Nutritive Aid

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 I. U.
Vitamin B₁ 3 mgs.
Vitamin B₂ 2 mgs.
Vitamin B₁₂ 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, Eucalypt, 0.7%
Invert Sugar, Glycerine,
Malt & Aromatics q.s.

STADMED LTD.
15, JAWPORE ROAD,
CALCUTTA-30

Mg. L. No. DL 62 M
DL 42 MB

STADMED LIMITED, CALCUTTA-4

Ergoapiol-(Smith)

A Menstrual Regulator . . .

When the periods are irregular, due to constitutional causes, ERGOAPIOL (Smith) is a reliable prescription. Containing apiol (M.H.S. special) together with ergot and oil of savin of the highest quality, this preparation effectively stimulates uterine tone and controls menstrual and postpartum bleeding.

In cases of Amenorrhea, Dysmenorrhea, Menorrhagia and Metrorrhagia, Ergoapiol serves as a good uterine tonic and hemostatic. Valuable in obstetrics after delivery of the child.

DOSAGE: 1 to 2 capsules 3 or 4 times daily. Supplied only in packages of 20 capsules. Literature on request.

As a safeguard against imposition the letters MHS are embossed on the inner surface of each capsule, visible only when the capsule is cut in half at seam as shown.

MARTIN H. SMITH COMPANY
NEW YORK, N.Y.



STERODIN

A dependable non-specific antigen containing bacterial elements with a wide range of therapeutic usefulness. It is of particular value in the early stages of an infective process. By mobilizing the defensive forces, Sterodin will either short the attack, or reduce the course of the disease.

Supplied in
2 cc. ampoules for subcutaneous or
intramuscular injection

T'PHONES
Bank 7211
" 1901

UNION DRUG CO. LTD.

285, BOWBAZAR STREET
CALCUTTA-12

T'ORAMH:
'BENZOIC'
Calcutta,

Branches at:

"Sakar Mansion,"
2, Jones Lane, Madras-1

Hargovind Desai Buildg.,
14, Old Hanuman Lane, Bombay-2

Assam Trunk Road,
Gauhati (Assam)

"INDULABO PASTE"

WHERE Induction of Labour is therapeutically indicated **Indulabo Paste** is used now by many doctors with perfectly safe results. The paste is useful right from the twelfth week after conception up to the full term according to indications. The preparation of **Indulabo Paste** is based on an original German formula which has been perfected by years of clinical trials and research in our laboratories by reputed physicians.

Prices: Rs. 45/- for the **Complete Outfit of Indulabo Paste** (containing one refill tube of Indulabo Paste, one special low pressure glass syringe with

metal cannula, and one turn key); per Refill tube of **Indulabo Paste** Rs. 35/-. Physicians who have already bought the **Complete Outfit of Indulabo Paste** once, should thereafter order for the Refill tube of Indulabo Paste only. When ordering please state what you want, the **Complete Outfit** or the **Refill**

Important:—"Indulabo Paste" is supplied only to qualified and registered doctors who must place their orders on their own letterheads or prescription blanks attaching their full signature.

Exhaustive literature giving composition, indications, etc., will be sent on request to the Members of the Medical Profession only.

HERING & KENT Post Box 323 (A.M.), Opp. Lloyd's Bank,
261-263, Cornaby Road, Fort, Bombay. Phone: 38797

In Case of Diabetes DIAMELIN

will be found extraordinarily effective

Composed of:

Hyd. Prep., Stan Prep., Ferri Sesquiox,
Perl Ust., Silic Bambus., Gum Opii,
Gum Cardam., Test Ovi Ust., Terra.
Ferrug., Ext. Eugen: Jambul., Ext. Tine-
spor., Ext. Azadirach., Ext. Fic. Glom.

• **DIAMELIN** is presented after prolonged experiments. It aims at not only correcting the defects of pancreas but also of the liver, nervous system, kidneys, and ductless glands which of late are also considered to be causative factors of diabetes.

• **DIAMELIN** does not suppress symptoms. It gives thorough and lasting results.

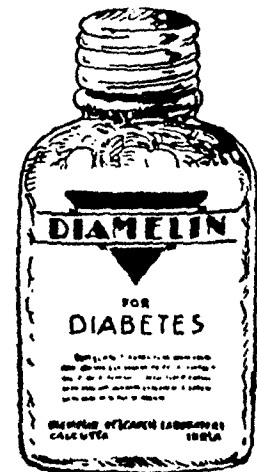
• **DIAMELIN** is very agreeable to take and is easily assimilable.

• **DIAMELIN** which is already extensively proscribed by doctors, is worthy of your trial.

Available in packing of 50 tablets at all leading chemists @ Rs. 5-12-0 per phial.

Detailed literature and samples on request from:

DIAMELIN RESEARCH LABORATORY, P. O. Box 107, CALCUTTA



BECALMED...

THE convalescent has successfully weathered the storm of acute illness but finds it difficult to recover from the aftermath. The patient is depressed, lethargic, is in fact in a state of being becalmed. In such cases a good tonic is needed to speed the voyage to recovery, and many physicians have found the answer in Waterbury's Compound. Waterbury's supplies easily assimilable iron, supported by manganese, calcium and phosphorus in rational proportions to ensure proper metabolic utilization. In addition, Waterbury's makes available guaiacol and creosote as tasteless, odourless sulphonates, readily acceptable even to

finicky patients.

**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

CASEO-ZYME

The hydrolysates of Casein and Yeast amply enriched with B Complex Vitamins and Lipotropic factors for successful Protein Therapy

*

Each fluid ounce contains

Amino Acids	20%	w/v
Proteolytic Enzymes	250	mg.
Vitamin B ₁	5	mg.
Vitamin B ₆	2	mg.
Methionine	200	mg.
Choline	200	mg.
Inositol	50	mg.

*

ASSOCIATED DRUG CO. LTD., Yercaud, S. INDIA

Complete Range of Drugs for Treatment of Amœbiasis

ZUTRACIN TABLET

ZANDU

(NEW ANTIBIOTIC BACITRACIN)

HISTOQUIN TABLET

Dihydroxyquinoline
Tablets of 0.21 gm.

Well known Non-Toxic
Drug for treatment of all
types of Intestinal
Amœbiasis

Specify
ZANDU
for
QUALITY

EMETINE PARENTERAL

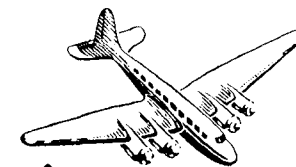
Emetine 1 gr. with Strychnine 1 60 gr.
Emetine 1 gr. with Strychnine 1 60 gr.
Embizan A (Emetine 1 gr. Vit. B₁ 25 mgms.)
Embizan B (Emetine 1 gr. Vit. B₁ 25 mgms.)

For details, please write to:

THE ZANDU PHARMACEUTICAL WORKS LTD.,
Gokhale Road South, P.O. Box No. 7015,
BOMBAY-28

Vereinigte Chininfabriken
ZIMMER & CO., G.m.b.H.
Mannheim-Waldhof (Germany)

Presents one of their
Outstanding Preparations:



Nervous irritation
and exhaustion,
Travel sickness,
Palpitation, spasms,
Cardiac and gastric
neuroses.

Prompt relief with



Sole Importers & Exclusive Distributors

PANNALAL BROS.,
44/45, Ezra St., CALCUTTA-I

Phone: 33-6527

Gram: 'PRONTOSIL'

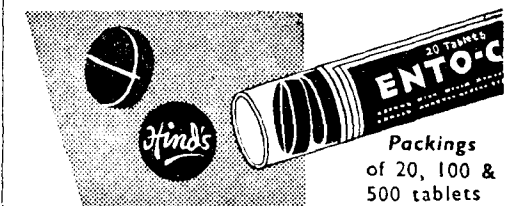
BROAD ANTI-PATHOGENIC
SPECTRUM

ENTO-CARB

A potent therapeutic agent for
the treatment of diarrhoeas of
diverse origin.

EACH TABLET CONTAINS:

Iodochloroxyquinoline	0.2	gm.
Sulphaguanidine	0.2	gm.
Activated Charcoal	0.12	gm.
Bismuth citras and Kaolin.	0.042	gm.



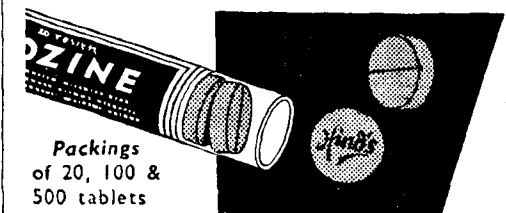
Packings
of 20, 100 &
500 tablets

ENTOZINE

For effective control of frequently co-existent amoebic and bacillary infections.

EACH TABLET CONTAINS:

Sulphadiazine	0.162	gm.
Sulphaguanidine	0.26	gm.
Iodochloroxyquinoline	0.2	gm.



Packings
of 20, 100 &
500 tablets

HIND CHEMICALS LTD.
Post Box 227, KANPUR

Antiphlozone Poultice

PRESCRIBED BY EMINENT
PHYSICIANS AND USED BY
HOSPITALS SINCE 1931



WHEN CONSTANT
MOIST HEAT IS
REQUIRED

1. To subside inflammation and stop PAIN.
2. To relieve SWELLINGS by increasing flow of blood.
3. To localize infections.

ANTIPHLOZONE POULTICE MAY BE USED AS
ADJUVANT IN CHEMO-THERAPY

Trial size (4½ oz.), Rs. 11-8 per doz.
No. 1 size (10½ oz.), Rs. 21/-

Postage Extra

Hospital size (5 lbs.) also available
NO FREE SAMPLE

Manufacturers:

THE ZONE CHEMICAL CO.,
BOMBAY-4

FOR

Arthritis, Fibrositis, Sciatica,
Rheumatism and Allied Diseases

TABLET

RHEUMOPHAN COMPOUND

(Gold Bhasma with Mahayograj Guggul
and Maharasnadi Quath)

Packings: 60, 120, 500 Tablets

Ref.: Treatment of "Rheumatism & Arthritis"
with Indigenous Drugs.

A Paper read at the 1st All India Medical Conference,
Lucknow

By Dr. M. V. BANSOD, M.S.,
Hon. Surgeon, Dept. of Surgery,
B. J. Medical College & Sassoon Hospitals,
Poona

Literature from:

ALARSIN PHARMACEUTICALS
(INDIA)

Post Box 14,

BOMBAY-1

FOR ASTHMA

EFELIN

TABLETS FOR ORAL USE

An effective combination for the relief of
ASTHMA and allied troubles.

Each tablet contains:

Aminophylline	... ½ gr.
Ephedrine Hcl.	... ¼ gr.
Phenobarbitone	... ¼ gr.
Caffeine	... ¼ gr.

The Combination of these Four Drugs Makes
"Efelin" A Reliable Drug in Bronchial and
Cardiac Asthma, Hay Fever, Chronic
Bronchitis Etc.

DOSE:—1 to 2 tablets during attacks.

ISSUED in Bottles of
25, 100 and 1000 tablets.

INDOCO REMEDIES LTD.,

457, Sardar Vallabhbhai Patel Rd., BOMBAY-4

SULFOMIN

(Phenyl methyl amine-p-amino-
benzenesulphonate)

for

LEPROSY

A sulfo-drug of proved efficiency
without any side reactions of
general sulphono preparations

Sold in 2 cc. Injectules of 0.05 gm.
In boxes of 6, 12 & 50 ampoules

**ALKALOID RESEARCH
LABORATORIES LTD.,**

47, Harish Chatterjee St.,

CALCUTTA-26

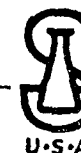
Schering's

CHLOR-TRIMETON Maleate
Highly potent Antihistaminic
for all allergic conditions

CORICIDIN

Antihistaminic plus A.P.C. —
effective cure for common cold

CORTADREN (Cortisone Acetate)
Tablets, Injectable and
Ophthalmic Suspension



U.S.A

Products of
Schering CORPORATION, U.S.A.

Sole Importers:

W. T. SURÉN & CO. LTD.,
P. O. Box 229, Bombay 1

T.C.F. FOLIC ACID COMPOUND

WITH
LIVER
EXTRACT

T.C.F. Folic Acid Compound with Liver
Extract is manufactured from NATURAL SOURCES
— yeast and liver. Each c.c. contains 0.5 mg.
Pteroyl Glutamic Acid, 0.6 mg. Pteroyl Hexaglu-
tate and all anti-anaemic erythrocyte-maturing principles
from 15 gms. of fresh liver.

For all macrocytic anaemias
— pregnancy, tropical, nutri-
tional — and anaemias as-
sociated with sprue and
gastro-intestinal etiology.

For intramuscular injection.
Boxes of 3, 6, 25 and 100
ampoules of 2 c.c. R. C.
vials of 10 c.c.



A Product of
**TEDDINGTON CHEMICAL
FACTORY LTD., BOMBAY.**

Sole Distributors:
W. T. SURÉN & CO. LTD.,
P. O. Box 229, BOMBAY 1.

NPH INSULIN

Simplifies Diabetic management through improved time action and fewer injections.
Unstable Cases of Severe Diabetes are the Test of Insulin Timing

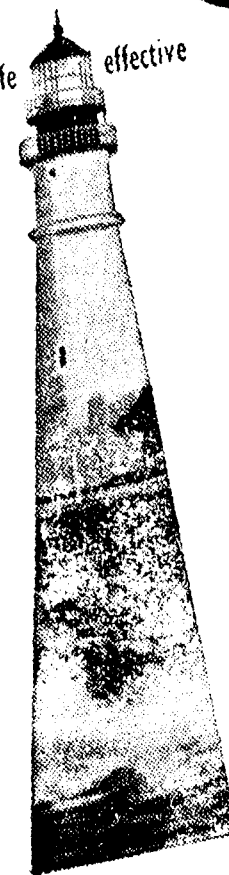
No special modification of Insulin can be expected to meet all the requirements of the "hard-to-manage" class of diabetic patients. With NPH Insulin, the results appear to be as good as and are often far better than those obtained by other means. NPH Insulin is regarded by many clinicians as the first really satisfactory modification designed to replace extemporaneous mixtures of unmodified Insulin with Protamine Zinc Insulin. Single daily injections of NPH Insulin provide an effect which closely parallels average requirements over a twenty-four-hour period.

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

New approach to adrenocortical hormone therapy

Cortril*

Safe effective



brand of hydrocortisone

the hormone that is
anti-rheumatic
anti-allergic
anti-inflammatory

Pfizer

11 times more potent than Cortisone with 2/3rd dosage of the later.
Will be made available in convenient dosage forms like:-

Cortril Tablets

Scored 10 mg in bottles of 25 & 100
Scored 20 mg in bottles of 20

Cortril Acetate Aqueous Suspension

5 cc vials 25 mg of hydrocortisone acetate per cc

Cortril Topical Ointment

1/6 ounce tubes in two strengths: 1% & 2.5% hydrocortisone

Terra-Cortril Topical Ointment

1/2 ounce tubes containing 1% Cortril and 3% Terramycin

Cortril Acetate Ophthalmic Ointment

1/8 ounce tubes in two strengths in bland, semi-fluid petrolatum base: 0.5% & 2.5% hydrocortisone acetate.

Terra-Cortril Ophthalmic Suspension

in bottles of 5cc containing 15 mg of Cortril & 5 mg of Terramycin per cc

PFIZER EASTERN CORPORATION, New York

Exclusive Distributors in India:
RAVISON PHARMACEUTICALS LTD.
P. O. Bag No. 10020 BOMBAY 1,
'GRAMS' 'RAVIPHARM'

REGISTERED TRADEMARK OF CHAS. PFIZER & CO. INC.

CLINITEST

TRADE MARK

urine-sugar analysis set

Distinct colours for reliable readings

DOCTORS AND PATIENTS CAN BE SURE OF THE RELIABILITY AND SIMPLICITY OF 'CLINITEST' (BRAND) SETS AND REAGENT TABLETS. THE MOST DISTINCT COLOUR SCALE, THE EASILY RECOGNISABLE COLOURS OF THE TEST, GIVE PATIENTS CONFIDENCE IN THEIR READINGS, SO REDUCING THE NUMBER OF UNNECESSARY VISITS TO DOCTORS. THIS ONE-MINUTE, NO HEATING, COPPER REDUCTION TABLET TEST CAN BE MADE EASILY EVEN UNDER TRAVELLING CONDITIONS. A VALUABLE INSTRUMENT FOR THE PRACTITIONER FOR ROUTINE SUGAR ANALYSIS. 'CLINITEST' IS THE ACCEPTED TEST FOR THE DETECTION AND CONTROL OF GLYCOSURIA.

Approved by the Medical Advisory Committee of the Diabetic Association in England

No. 2155 Complete Set, including 24 Foil-Wrapped Tablets.
No. 2157 Refill bottles (24 Foil-Wrapped Reagent Tablets).

SOLE AGENTS

MARTIN & HARRIS LTD., CALCUTTA.

BRANCHES : BOMBAY, MADRAS & DELHI.

Manufactured by Miles Laboratories Ltd., Bridgend, South Wales, under licence from Ames Company, Inc.

**E
L
K
O
S
I
N**

**for greater efficacy
in sulphonamide therapy.**

TABLETS 0.5 G.
Tube of 20
Bottle of 200
Tin of 1000

SYRUP 10%
Bottle of 100 c.c.

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

For Hepato-biliary disorders

colibil



Each fl. oz. of Colibil contains:

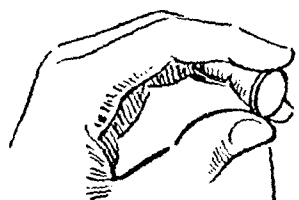
Choline Chloride	1 1/2 Gm.
Desiccated Whole Bile	150 mg.
Dehydrocholic Acid	100 mg.
Proteolysed Liver Ext. eq. to 10 Gms. of fresh liver	

In a base composed of Pharmaceutical and Indigenously drugs known as efficient hepatic stimulants and cholagogues.

Available in 2 oz. & 4 oz. phials.
Also COLIBIL with M.L. HEPATHIN is available.

THE CALCUTTA CHEMICAL CO. LTD.,
CALCUTTA-29
South India Office: 4/143, Broadway, Madras.

★ *6 Essential VITAMINS
in one tablet/*



CEBETINA

is a 'Therapeutic Formula' of water-soluble vitamins of great value during disease and after operation.

Ascorbic Acid	...	150 mg.
Thiamine Mononitrate	...	15 mg.
Riboflavin Soluble	...	15 mg.
Pyridoxine Hydrochloride	...	10 mg.
Calcium Pantothenate	...	25 mg.
Nicotinamide	...	50 mg.

In each tablet

Available in phials of 25 and 100 tablets

THE CALCUTTA CHEMICAL CO. LTD., CALCUTTA-29
Samples & literature are supplied on request.
Branches at: Madras, Bombay, Vizag, Bangalore, Nagpur, Delhi, Patna, Jamshepur, Bhubaneswar, Ranchi, Madhapur, Assam, Biligiri

The Antiseptic

A Monthly Journal of Medicine and Surgery
Published on the 8th of every month
Founded by the late Dr. U. RAMA RAU in 1904

Editor: U. KRISHNA RAU, M.B., B.S., M.D.A.
Associate Editor: U. VASUDEVA RAU, M.B., B.S.
Editorial & Publishing Office: 323-24, Thambu Chetty St., Madras-1
Annual Subscription: Rs. 7-8-0. Foreign—Rs. 10 Post Paid

Vol. 52

JUNE, 1955

No. 6

Original Articles

WANTED A NATIONAL PROGRAMME FOR THE CONTROL OF VENEREAL DISEASES*

R. V. RAJAN, M.S., F.R.C.P. (Edin.),
Director, Upgraded Venereal Diseases Department,
Government General Hospital, Madras

Introduction.—While we have a national plan for other communicable diseases like malaria, tuberculosis, leprosy, filariasis, the problem of venereal diseases has not received the attention which it deserves. The World Health Organization assigned the third place to venereal disease next to malaria and tuberculosis in communicable disease priorities. There is an unjustifiable complacency among the public, the medical profession and even the medical administrations regarding the importance and urgency of the problem. The 'dying syphilologist' the expiring urologist are some of the expressions used by the unthinking among the medical profession. Since the advent of penicillin, it is true that from the point of view of the individual sufferer, gonorrhoea can be cured in a few days and syphilis in two weeks. But these diseases with a community-wide distribution cannot be controlled or combated on the basis of individual treatment of persons who voluntarily seek treatment at a public clinic or from private physicians.

Among the group of venereal diseases, syphilis offers a challenge to the health administrator and constitutes a major health hazard to the individual and the community.

In no other communicable disease, have we such effective tools of rapid diagnosis and treatment as in syphilis. By the application of certain public health techniques, it is possible to bring down the reservoir of infectious syphilis in the population. This has been

*Specially contributed to the ANTISEPTIC.

amply borne out by the remarkable decline of infectious syphilis in the countries of the West since World War II.

In these countries, the national governments set up control organisations in which the therapeutic, epidemiological, and educational aspects of V.D. control were successfully integrated.

What is the status of venereal diseases in the Republic of India? To take syphilis as the major menace to health among the group of venereal diseases:

There are no accurate statistical data on the morbidity and mortality of syphilis in our country. From the limited information available on the prevalence and incidence of syphilis, based upon the attendance of patients in clinics and hospitals and limited surveys of groups of population, it would appear that syphilis next to malaria and tuberculosis is a major public health problem in our country.

Here are some facts to spotlight the seriousness of the current situation: (1) Treponemal disease is prevalent in the Indian Union in three forms—(a) Venereal syphilis; (b) Endemic syphilis—venereal and non-venereal and (c) Yaws.

Venereal syphilis is mostly prevalent in urban areas, cities, towns, seaports, industrial centres, and pilgrim centres. Endemic syphilis is prevalent in the primitive hill folks inhabiting the vast sub himalayan area extending from Kashmir in the north west to Assam in the north-east, and also in the vast slum populations of cities. The third pattern of treponemal disease, yaws is reported to be endemic in the valleys and hills of Assam, certain contiguous areas of the states of Andhra, Hyderabad, Madhya Pradesh and Orissa and in certain isolated enclaves of the rural areas of the Madras State.

Treponematoses may be regarded as a signal example in the realm of communicable diseases, where the host-parasite relationship has changed with the changing environmental and socio-economic conditions of human populations.

A synthetic view of the disease patterns—venereal syphilis, non-venereal syphilis, and yaws is justified on the following grounds:

- (a) Historical evolution of the disease.
- (b) Identity in the morphology of the parasitic agent.
- (c) Fundamental sameness of the pathological reaction of the tissues.
- (d) Identical serological reaction.
- (e) The existence of cross-immunity between the disease syndromes.
- (f) Response to treatment with chemo-therapeutic and antibiotic drugs.

With the increasing urbanisation consequent on shifting of populations from the rural to the urban areas and the impending

accelerated tempo of industrialization visualised in the second Five Year Plan, syphilis will pose a serious and urgent problem.

2. A perusal of the annual clinic admissions in the teaching hospitals of Madras, Bombay, and Calcutta reveals that of the total admissions for syphilis, 66 to 75% are for early infectious syphilis while in Western Clinics, early infectious syphilis forms only 1/4 or 1/5 of the total syphilis admissions.

3. The sex-ratio of early infectious syphilis patients reporting at clinics is 3 or 4 males to 1 female. Hence there is a large undiscovered reservoir of infection among women, who never reach hospital clinics and are spreading the infection among the population. Analysing the age specific rates among reported cases of early infectious syphilis, the greater risk of infection is in the age group 15 to 30 and constitutes 80% of the reported total infectious load.

4. Morbidity and mortality of infants born of syphilitic mothers. On an analysis of 1,000 pregnancies sustained by 260 pregnant women with untreated syphilis, the results of the outcome of pregnancy was as follows:

Healthy non-syphilitic children	... 30%
Syphilitic babies	... 40%
Still-births and neo-natal deaths	... 30%

This means that 7 out of 10 children born to untreated syphilitic mothers are born either dead or diseased. The stigmata of congenital syphilis among those who survive are frequently sufficiently crippling to make such children costly, non-productive burdens on society in later life.

There is talk about the rehabilitation of the blind, the deaf and the crippled child. In the field of preventive medicine pertaining to childhood disorders, rehabilitation is the last desperate cry of society to make up for its neglect to prevent the causes that lead to the maiming and crippling of the sweetest creation on God's earth. Prenatal syphilis is one such preventable disorder. It is surely the basic right of an infant to be born free of syphilis.

5. Syphilis is one of the blinding diseases both in children and adults. Routine serological screening of patients for syphilis attending the Government Ophthalmic Hospital, Madras, for ocular disease for the three years 1951-53 revealed 16.1% of positive reactors to syphilis and it is our surmise that about 1/5 of total blindness in children and adults in which an infectious aetiology could be established is due to neglected or undiscovered syphilis.

6. The effect of syphilis on the cardiovascular system is well known. From figures published from teaching hospitals, it would appear that syphilis accounts for 12 to 15% of the total organic disease of the heart and blood vessels admitted for treatment.

Although the late parenchymatous lesions of the nervous system caused by syphilis are not so common as in western countries, meningeal and meningovascular syphilis particularly affecting the spinal cord, occur in 3 to 5% of total syphilis admissions in hospitals.

These data gathered mostly from the hospitals in the City of Madras may equally apply to the other big cities such as Bombay and Calcutta. Although these figures based upon diseased population groups seeking admission and treatment in hospitals do not give an accurate picture of the prevalence or incidence of syphilis in the population as a whole and are subject to errors of over or under-estimation, yet they should be sufficiently disturbing to our complacency and should make us sit up and take note. The true prevalence rate of syphilis can never be determined short of blood-testing of the entire population. Such a procedure is impossible and impracticable.

7. Studies on the prevalence of syphilis among pregnant women are free of many of the objectionable selective features, inherent in population groups that come under medical care for other conditions including syphilis. Such pregnant women are not biologically selected because they are suffering from a disease but because of a natural physiological function. Pregnancy thus provides a natural physiologically selective mechanism in a relatively small segment of the general population which is fairly constant year after year in its proportional representation of the various strata of society. Hence the prevalence of syphilis in such a physiologically selected sample of the population as pregnant women offers a relatively reliable and a convenient index of the extent of syphilis infection in the community as a whole. Here are some recent figures:—

Routine serological screening of 11,736 consecutive expectant mothers who attended the ante-natal clinics of the Women and Children Hospital, Madras, in 1953 revealed 6.3% of positive reactors to syphilis. Among 13,609 pregnant women who attended the ante-natal clinics of the Municipal Corporation of Madras in 1952-53 the percentage of positive reactors to syphilis was 7.2. Curiously enough when we recently blood-tested 159 non-pregnant women from a Women's Welfare Home in Madras, consisting of deserted wives, widows etc., we found almost the same percentage about 7.8% of positive reactors. Prior studies at Simla Hospital, Calcutta Hospitals and Singur Health Unit had shown a percentage rating of positive reactors from pregnant women routinely tested for syphilis, ranging from 4 to 7.5%. Hence it can reasonably be claimed that the prevalence of syphilis among apparently normal pregnant women is a measure of its prevalence among the general population. In other words, a 5% prevalence rate for the whole of India may be a conservative estimate of the status of syphilis among the teeming populations of our country. If hospital and clinic

rates for early infectious syphilis are any indication, it is reasonable to assume that there is a considerable reservoir of infectious syphilis among the population in the scale of about 3,000 to 4,000 per hundred thousand of the population in urban and semi-urban areas.

8. Confirmation of the reliability of prevalence rates for syphilis in the general population based upon the percentage rating of positive reactors to syphilis among pregnant women, is available from another apparently normal group, the voluntary blood donors. During the year ending 31st July 1954, 5,952 voluntary blood donors attending the Blood Bank of the Government General Hospital, Madras, were serologically tested at the laboratory of the V.D. Department and the percentage rating of positive reactors to syphilis was 5.3. An identical prevalence-rate was reported from Calcutta hospitals.

Endemic syphilis.—The WHO Demonstration Team under the leadership of Dr. Cutler carried out extensive surveys of groups of hill populations in Himachal Pradesh which revealed a high prevalence rate of syphilis varying from 5 to 50%. It is presumed that a similar high rate exists in other areas from Kashmir to Assam. Non-venereal, acquired, childhood syphilis has recently been discovered among the slum populations in the City of Madras and its environs. These populations in the 400 odd slums live under conditions of squalor, total lack of hygiene and debased sexual standards. Adult venereal syphilis, juvenile venereal syphilis, and non-venereal, acquired, childhood syphilis thrive cheek by jowl in this pitiable section of humanity. What is true of Madras slums must also be true of slums in other big cities of our country with a growing population.

Yaws.—The third type of non-venereal treponematoses, is not a major public health problem as Syphilis is, in the current situation. The state governments of Andhra, Hyderabad and Madhya Pradesh with the help and technical advice of WHO and UNICEF have launched a mass project of Yaws control in the contiguous areas where yaws is endemic among the backward populations.

The other major venereal disease, gonorrhoea, has lost much of its ancient terror for the individual sufferer and may be a minor treatment problem among those who are discovered. The great problem still remains among undiscovered cases, predominantly women who are symptomless carriers of infection. It is considered by those who are in daily professional contact with the disease, that the increasing and widespread use of penicillin for a variety of other disease conditions, has changed the disease from a 'Hyde to a Jekyll' pattern although quantitative evidence in support of this presumption is not available. Much less information is available about either the incidence or prevalence of gonorrhoea in the population. Even in countries where an efficient V.D. control organisation has been operating for many years, the incidence

of gonorrhoea has not shown any precipitous decline as that of syphilis.

We have no cost analysis and accounting of uncontrolled and undiscovered syphilis. But the economic burden of venereal disease on the community and on the State living on a subsistence level must be considerable.

"To the physical havoc wrought by these diseases and by the conditions in which they breed, must be added the social wreckage of twisted moral and ethical values, of warped and irreparable damaged lives."

What is the present situation on the control of venereal diseases?—Facilities for the diagnosis and treatment of syphilis and other venereal diseases exist in the larger hospitals of the cities and some of the major municipalities. But these are grossly inadequate both in quality and quantity. Except in one State of the Union, the concept of control of venereal diseases is non-existent. The treatment clinics which are operating in the hospitals are like revolving doors of department stores in which an enormous clinic load gets in and gets out and no further notice is taken. There is a sad lack of epidemiological investigation, patient education, and case-finding activities.

It is my presumption that a large but unknown number of venereal disease patients are being treated by private physicians practising modern medicine, practitioners of other schools, and an army of unqualified quacks. I understand in the last category are a few women Venereologists who profitably combine the purveying of sex and treatment of the consequences! The standards of scientific diagnosis and treatment leave much to be desired both in the public clinics and among private practitioners. A sort of hit or miss therapy prevails in the treatment of these diseases.

At the request of the Government of India the World Health Organization sent a Venereal Diseases Demonstration Team in 1949 to work side by side with a matching National Team to establish a centre for a survey and mass treatment of syphilis among the Paharis of Himachal Pradesh, and also to train teams of doctors, technicians, nurses etc., in the modern methods of venereal diseases control. 14 teams were trained during the period of the project who were sent from different states at the instance of the Central Government and at the end of the three months' training, were supplied with laboratory equipment and Penicillin by UNICEF to establish V.D. control activities in their respective states. The present status of the activities of these control teams in the different states is not known. In 1949 Dr. Leiby, a WHO consultant from the States, at the request of the Central Government, toured the country, visiting hospitals, V.D. clinics, contacted Medical and Health Administrators and submitted a report for the control of venereal diseases in India.

The Central Government has recently taken steps for the manufacture of Penicillin with the technical help of WHO and financial aid from UNICEF. Steps have also been taken for the preparation of Cardiolipin antigen at the serological laboratory, Calcutta. As part of the scheme for the establishment of an All India Medical Institute for post-graduate training and research and on the recommendations of the Upgrading Committee, the Venereal Diseases Department of the Government General Hospital and Medical College, Madras, was upgraded in 1952 to serve as a central institution for the training of medical and para-medical personnel, for advanced research in the various aspects of venereal diseases and to serve as a model unit for demonstrating the clinical, laboratory, social and preventive aspects of V.D. control. The WHO generously came forward to help in the implementing of the upgrading scheme with laboratory and educational equipment, transport for epidemiological and case-finding procedures and technical personnel. Besides, the organization granted two fellowships for the medical officers of the department for training abroad. They have satisfactorily completed their fellowship training and one of them has just returned having qualified for M.P.H. of Johns Hopkins University, Baltimore.

Discussion.—There is sufficient data available to suggest that in the larger cities and industrial areas, the prevalence of venereal diseases is disturbingly high, claiming around 5 to 7% of the population for syphilis alone. The majority of the victims of the disease in these populations belong to the ignorant, under-privileged sections. The problem in the rural areas is not defined, although it is usual to quote Sir John Megaw's figure of 3.7% for India's agricultural population based upon the unreliable replies to questionnaires sent to dispensary doctors in villages. The preventive bias in the current medical education is sadly lacking. "Much will have to be accomplished by medical educationists before the satisfaction, the average physician finds in his direct relation to his patient can be replaced by his satisfaction in his service to the community as a whole." "Permanent improvement in a nation's health cannot be secured by clinical medicine alone." In the memorable words of Prof. J. M. Mackintosh, 'sickness is an incident—grave or troublesome in the life of a person but to the hospital and its staff, sickness is a challenge, a focus of enquiry from which prevention should radiate as well as cure of the individual patient.' These words particularly apply to a communicable disease like syphilis in which treatment and prevention are one and indivisible. There are proposals to create a Chair of Preventive and Social Medicine in each medical college. Unless every teacher of clinical medicine in a teaching institution is imbued with the knowledge of the social and environmental impact on disease and integrates his day to day clinical teaching with a preventive bias, the mere creation of a separate Chair of Social and Preventive Medicine will be one more

clog in the wheel of compartmentalism in medical education and will fail of its purpose. Venereal diseases, more than any other group of communicable diseases offer unique opportunities for the inculcation of the principles and practice of social and preventive medicine.

Venereal diseases are intimately associated with the social condition and economic status of the people. They are not controllable by any means of prophylactic vaccination now known. Immunity is not provided by an attack and efficiency of therapy is, therefore, not a sufficient guarantee against continuation of infection in the population.

Prostitution and venereal diseases—Prostitution and venereal diseases are a sort of Siamese twins and no operation has been devised which can separate the two to the destruction of the one and the disappearance of the other. 'Prostitution is not a medical problem with a moral aspect, but a moral problem, a socio-economic problem with a medical aspect.' The human propensity for sexual promiscuity whether stemming from social, economic or psychological factors, cannot be abolished by an act of Parliament. In urban areas, prostitution is hydra-headed. We have the commercialised exploitation of many helpless girls and women by a few antisocial parasites. A large number belong to the casual clandestine type. 'Wife prostitution' among the lower economic levels with or without the connivance of the husband is another disturbing feature of urban life. Some of the states in the Indian Union, have laws on their statute book against commercialised prostitution. But how far they are effectively and honestly applied by the Myrmidons of law, is anybody's guess. There is no doubt that rigorous law enforcement measures will mitigate and cause reduction in the frequency of sexual exposures per unit of time and result in a corresponding lowering of the venereal disease incidence. Sex is the cheapest commodity among the poorer sections of the urban population and the appalling unhygienic conditions in which the sex act is performed, contribute in a significant measure to the spread of V.D. It is encouraging to note that the Central Government will shortly put before the legislature an all-comprehensive measure for the 'Suppression of Immoral Traffic' in our country. Side by side with law enforcement measures, organised efforts should be made to rouse the moral and sanitary conscience of the community and to inculcate a sense of personal responsibility in the age groups of the population who are most likely to be promiscuous. For the control of venereal diseases, our main reliance should be the public health approach of breaking the chain of infection with the therapeutic, epidemiological, and educational hammers.

A national plan for the control of venereal diseases is an urgent desideratum. The Central Government should assume

dynamic leadership and call for the co-operation of the constituent states in the fight against these social diseases. In view of the proposed concentration on industrialisation in the Second Five Year Plan, the necessity for control of the spread of venereal diseases, assumes a greater urgency and provision should be made for adequate funds in the Second Five Year Plan.

As syphilis is the most serious of the venereal diseases with respect to its morbidity and mortality, major emphasis should be laid on this disease. In attacking syphilis the control of all the other venereal diseases will benefit at the same time. In the first instance, one segment of the large syphilis problem, namely, control of infectious syphilis with prevention of prenatal syphilis, should receive the top-most priority.

The control of a communicable disease such as syphilis should vest with the public health authority and this fundamental principle should be impressed upon some of the States, where a dichotomy of health services prevails and communicable diseases like syphilis and tuberculosis are under the administrative control of the head of the curative services. No progress can be made in communicable diseases control as long as this anomaly of criss-cross dualism persists.

SUGGESTED MEASURES FOR A NATIONAL PLAN FOR THE CONTROL OF SYPHILIS AND OTHER VENEREAL DISEASES:—This is not a blueprint for action but contains tentative suggestions put forward for the consideration of the Government of India and the Planning Commission.

Central organization.—(1) A venereal diseases control division should be established in the Office of the Director-General of Health Services at Delhi. This division should plan, develop, and expand a nation-wide venereal diseases control programme during the period of the Second Five Year Plan. The Chief of the division should have a good working knowledge of the clinical and laboratory aspects of venereal diseases on the one hand and of bio-statistics, epidemiology and public health administration as these disciplines relate to venereal diseases.

(2) The establishment of a Central Advisory Council under the Chairmanship of the Director-General of Health Services and consisting of provincial Health Administrators, Clinicians and Laboratory Directors and non-official citizens interested in the social and educational aspects of the V.D. control.

(3) Establishment of V.D. control sections in the States under the administrative authority of the provincial Directors of Public Health: In the initial stage, a control section may be established in each of the states where high prevalence rates of venereal diseases are reported.

(4) A Central Reference Laboratory under the control of the Chief of the V.D. Division for the central production or purchase of

antigen and other reagents and distribution to the other state laboratories, for the setting up of minimum requirements for technical procedures and laboratories, and for fostering uniformity in testing procedures by the publication of manuals on Serology and to initiate inter-laboratory serological evaluation studies.

(5) Post-graduate training in venereal diseases control for medical officers, laboratory training for serologists and technicians and training of nurses, health-visitors, and social workers. Persons with a prior public qualification and experience should be preferred for post-graduate training both for the administrative and the clinical and laboratory aspects of V.D. control. The medical personnel should be salaried and whole-time and debarred from private practice. For the training of medical and para-medical personnel for the control scheme, the All India Institute of Hygiene and Public Health at Calcutta and the Upgraded Venereal Diseases Department of the Government General Hospital, Madras, may be chosen as centres, the former for basic training in public health, public health nursing, laboratory procedures and health education, and the latter for specialised training in V.D. control for medical and para-medical personnel.

(6) Supply of drugs:—Procaine penicillin in oil with aluminium monostearate is the drug of choice for the routine treatment of syphilis and gonorrhoea. The penicillin factory should give a high priority for the large scale production of procaine penicillin in oil. Pending self-sufficiency of procaine penicillin manufacture in India, liberalisation of import facilities and large scale purchase from abroad at competitive rates are indicated. Advance requirements of penicillin for the exclusive treatment of women and children suffering from syphilis. Treatment of the infected individual and contacts is the linch-pin of the whole control scheme and is a major item to be budgeted for.

(7) Preparation of educational propaganda material in the major languages of the states by a Central Organisation and distribution to the various control units in the states or alternatively the states health administration may assume responsibility for the preparation of educational material to suit the particular social and cultural standards of the state.

(8) Collection, maintenance, publication and distribution of statistical and scientific literatures pertaining to venereal diseases control.

(9) A quarterly bulletin of the progress of the control scheme may be issued from the V.D. Division of the Central Directorate of Health Services and given wide spread publicity. This procedure will keep the public constantly alerted to the importance of the problem, besides having an educational value.

At the state level.—(1) V.D. control sections should be established under the Director of Public Health in each state. The clinics and laboratories shall be under the over-all control of the V.D. Control Officer of the state.

(2) In consultation with these states, one or more urban centres having a high venereal diseases prevalence may be chosen in each state for establishing control projects. The number of V.D. clinics and their locations in each of the chosen urban areas will depend upon the geographical extent, the concentration of the population in particular sections of the area, and on the extent of the facilities available in hospitals for the treatment of V.D. The location of clinics in strategic centres is an important consideration in the planning programme. Two types of clinics are visualised: (a) the V.D. clinics with a certain number of beds for hospitalization, in association with and as part of teaching in General and Women and Children Hospitals of the urban area, and (b) *ad hoc* clinics under the control of and run by the municipal authorities, the latter providing only ambulatory treatment.

(3) Establishment of laboratories for the serological diagnosis of syphilis, bacteriological and cultural examination of other venereal disease specimens in each of the urban areas. A reference laboratory in each state or urban area which will supply antigen, reagents etc., obtained from the laboratory and would also serve as control to the local laboratories attached to the clinics. The Reference Laboratory when properly developed would also serve as training centres for doctor serologists, laboratory assistants and technicians. The Reference Laboratory of each state or urban area, may either function as part of a training hospital or as a section of a Public Health Laboratory under the Municipal Health Officer. In either case the reference laboratory should be in a position to perform routinely a battery of two or three serological tests for teaching, training and control purposes, carry out bacteriological and cultural examination of specimens which may be referred from other clinics.

Every clinic should be equipped to carry out dark-field examinations for T.P. and smear examinations for gonococci and other organisms as part of the daily routine for quick diagnosis and treatment. The *ad hoc* clinics, may have their bloods tested for syphilis in the Reference Laboratory of the area while the clinics with a heavy clinic-load attached to teaching hospitals, large maternity hospitals etc., should be provided with a simple set-up for performing a single, quick, easily carried-out and economical test like the VDRL slide test.

While blood-testing of all patients attending the V.D. clinics of the area under control, should be routinely carried out, it should be obligatory on the staff of the Maternity and Child Health centres of the urban area to blood-test for syphilis, every pregnant woman

attending the Maternity and Child Welfare clinics. As these Maternity and Child Welfare centres are under the administrative control of the Municipal Health Department, the Municipal Public Health Laboratory of the State Reference Laboratory should undertake the testing of bloods of all the pregnant women who will be screened by the Maternity and Child Health clinics. At least two blood tests for syphilis should be the routine procedure in the pre-natal care of every pregnant woman, one early in pregnancy and the other late in the third trimester of pregnancy. The male marital partners of the positive reactors among pregnant women should be directed to go to the nearest V. D. clinic for examination and treatment. If this epidemiological precaution of testing and treating the male marital partner at the same time is not observed a well treated infected wife in early pregnancy may get reinfected during the latter months with disastrous consequences to the fetus in utero. This sort of 'ping-pong' syphilis in which the infection is batted to and forth between married partners is by no means uncommon in familial syphilis since the advent of penicillin in syphilo-therapy. The syphilitic pregnant women should be treated at the ante-natal clinics and not sent to a crowded mixed V.D. clinic. With the advent of penicillin, the occurrence of pre-natal syphilis could be virtually eliminated by adequate treatment of every syphilitic pregnant woman; and a great social responsibility rests on all those who look after expectant mothers.

(4) A continuous educational campaign against venereal diseases by all the modern devices to focus public attention and sensitize the public conscience, and graded to suit particular educational and cultural levels should be instituted under the supervision and guidance of the provincial control officer. The responsibility for the preparation of the educational propaganda material has already been mentioned.

(5) Every V. D. Clinic and Maternity and Child Welfare Centre should have on its staff trained Social Workers and Health Visitors for the purpose of interviewing and education of the patients, case-finding and contact investigation. The slogan of these workers should be 'find syphilis and treat faster than it can spread.'

(6) In the control area, the co-operation of the private physicians should be sought for by affording them short training courses, free diagnostic and consultative facilities to enable them to treat their patients effectively. Without doing violence to the patient-doctor relationship, the physicians may be asked to anonymously report the cases under their care to the authority for statistical purposes. Too much of red-tapism and filling of numerous forms by the private physician should be avoided if the whole hearted co-operation of the busy practitioner is to be obtained. The physician in his turn should help the health authority

or the control officer, in case-finding and contact investigation by affording reliable information regarding the identity of the contact obtained confidentially from the patient.

(7) Every V.D. clinic should be required to maintain proper records of work performed and send a monthly epidemiological report to the V.D. Control Officer of his area who, in his turn, shall be required to send a consolidated report to the V.D. control division at the centre.

(8) In addition to the stationary clinics in each of the urban centres, there should be one or more field units attached to one of the clinics or V.D. control section for carrying out field surveys and treatment among specific population groups in the rural areas.

Financing of the project will be the joint responsibility of the Central and State governments. During the first five years of the programme, the Central Government may have to meet a major share of the cost of the programme to secure the willing co-operation of the states.

The cost of penicillin, expensive laboratory equipment, training of personnel and cost of transport are major items to be budgeted for by the Central government while accommodation for clinic and laboratory and operational costs of the state programmes should be met from state funds. The assistance of UNICEF may be sought for the donation of penicillin and certain specialised laboratory equipment.

Initial phase - *Planning*: 1st year.—(1) Establishment of a V.D. Control Division at the centre. (2) Obtaining of detailed data from the States through a comprehensive questionnaire. (3) Preparation of a tentative national programme by the Chief of the V.D. Division from the data obtained from the states. (4) Setting up of a Central Advisory Council to discuss, modify and finalise the project and preparation of blue-prints for action. (5) Training of medical and para-medical personnel recruited by each state in specified training centres. (6) Purchase of penicillin, laboratory equipment and transport.

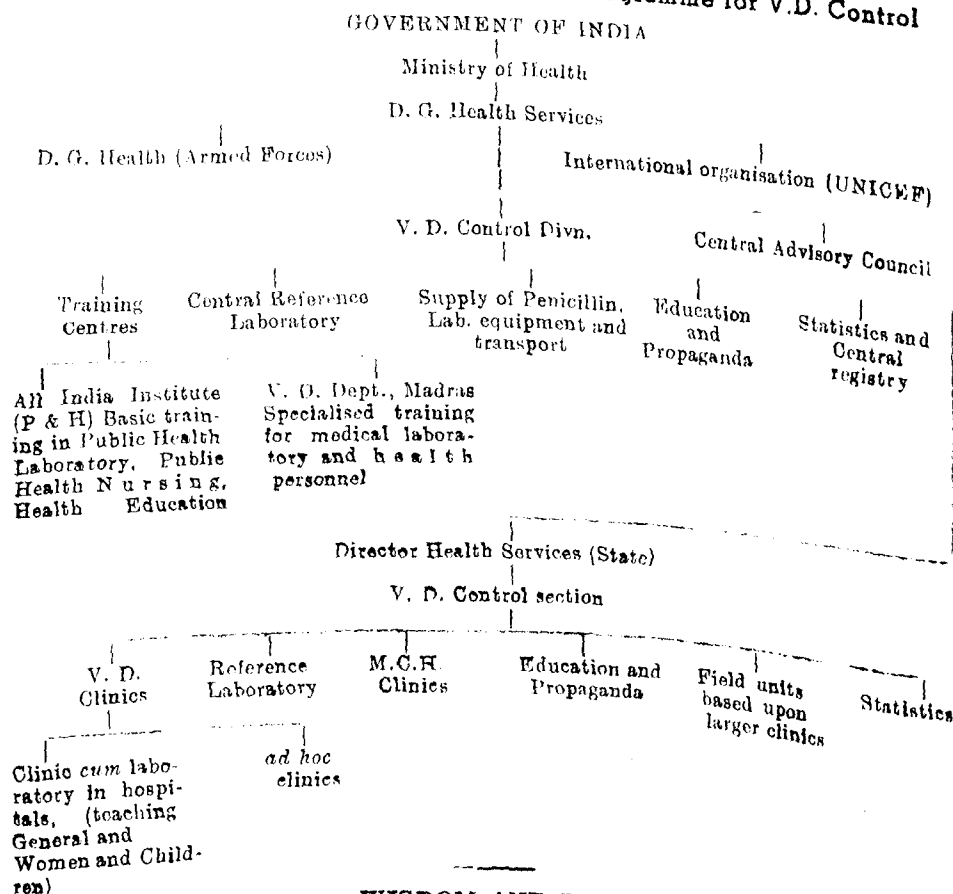
Second phase - *Project*: 2 years.—(1) V. D. control section in the states which have opted to come into the National Plan. (2) Organisation of one or more V.D. control units in each state. (3) The establishment of a Reference Laboratory in each state. (4) Establishment of an adequate number of V.D. clinics in each control unit, (one clinic for 200,000 of the urban population). (5) Routine serological screening of pregnant women attending the ante-natal clinics in the area of the control unit and treatment of the positive reactors to syphilis. (6) Preparation of educational propaganda material.

Third phase - *Consolidation and expansion of the control scheme in each State* - 2 years.—(1) Planned research on the clinical,

laboratory, and field aspects of V.D. control by the state control sections in their hospitals, clinics, and laboratories. (2) Field survey and mass treatment of specific population groups. (3) Assessment of the results of the project at the end of five years in terms of cost analysis, reduction in the quantum of disease in the population at risk who were benefited by the national project. (4) During the expansion phase of the state programmes at the end of five years, the Central government may have to render financial assistance but on a more restricted scale which cannot be visualised now.

The details of the staff, equipment, supply of drugs etc., for the project and the financial responsibility of the Centre and the States will have to be worked out by a small Committee of experts.

Charted Bird's Eye View of the National Programme for V.D. Control



WISDOM AND LOVE

Man is continually saying to woman, why will you not be more wise? Woman is continually saying to man, why will you not be more loving? It is not in their wills to be wise or loving; but unless each is both wise and loving, there can be neither wisdom nor true love. —(Thoreau, via *J. Int. Coll. Surg.*, Jan. 1955).

X-RAY AND RADIUM THERAPY IN THE TREATMENT OF CERTAIN INFLAMMATORY AND BENIGN CONDITIONS*

K. M. RAI, M.B., B.S., F.R.C.S. (Edn.), D.M.R. (L),
Director, The Barnard Institute of Radiology, Govt. General Hospital, and
Professor of Radiology, Madras Medical College, Madras

FOR a very considerable time after the discovery of X-rays and radium, except for the treatment of certain skin conditions, the therapeutic use of X-rays and radium was largely associated with the treatment of malignant conditions. But during the past two decades the use of these rays have been greatly extended into the field of treatment of non-malignant conditions as well. Such use is being continuously expanded year after year by various clinical researches so that now it has come to be considered a useful therapeutic measure in a large number of benign conditions. At the Barnard Institute of Radiology, General Hospital, Madras, X-rays and radium are extensively used in a large number of benign conditions during the past 15 years and the Institute has also extended the use of these agents in several conditions for which previously very little or no use of these therapeutic agents were thought of. The groups of diseases which are benefited by such treatment in our experience can be broadly classified as follows:— (1) Inflammatory conditions. (2) Ankylosing spondylitis. (3) Osteoclastoma. (4) Certain benign pathological conditions of the uterus and ovaries, and (5) Certain miscellaneous conditions.

Inflammatory conditions.—The treatment of inflammatory conditions is by exposing the site of infection directly to the radio-therapeutic source; i.e. irradiating the site of infection and the beneficial action of radiotherapy seem indisputable in a certain number of these inflammatory affections, particularly the acute, the sub-acute and the localised lesions. The changes that take place under the influence of such therapy are both local and general and a brief study of these will help in understanding the mode of action of radiotherapy. These changes may be grouped as follows:—

(a) *Clinical*:—These are both subjective and objective. Subjectively there will be improvement in the general condition of the patient with a decrease of pain. Objectively there may occur a slight exacerbation of local signs during the first few hours following irradiation. At the end of 24 to 48 hours there will be diminution of the swelling, infiltration and redness. The temperature curve will be in accordance with the tendency either to the formation of pus or a progressive resorption of the exudates up to a complete resolution of the condition.

*Specially contributed to the ANTISEPTIC.

(b) *Local modifications*:—24 to 48 hours after irradiation the progressive disappearance of the germs in the irradiated area can be proved and a large proportion of the organisms appear to be phagocytosed.

(c) *Modifications in the circulating blood*:—There is a leucopenia immediately or some hours after irradiation followed by a leucocytosis lasting for over a period of 24 to 48 hours, where an increase in the proportion of polynuclears with a tendency for the Arneth index to deviate still more towards the left (polynuclears with two nuclei); presence of some myelocytes; and lymphopenia relative or sometimes absolute.

(d) *Serological modifications*:—It is stated by some workers that they have observed an increase of the phagocytic power, the opsonic index and the bacteriolytic power following the irradiation of an inflammatory focus. But this has been disputed by others. On the whole although a direct bactericidal action is not demonstrable with small doses of radiation, as are commonly used in these treatments, it should not be forgotten that radio-therapy can act in an indirect way by modifying the supporting tissue, and the efficacy of radiotherapy in inflammatory conditions is essentially a local action and in the mechanisms of the action of X-rays, the final influence is the combined sum total of various factors which are called into action at each irradiation and these factors which are considered as:—(i) The action of the radiations on the local circulation. (ii) The necrobiotic action on the cells of the infiltrated tissue. (iii) The action of the radiations on phagocytosis. (iv) The action of the radiations of the cutaneous reticulo-endothelial system.

Of these, the last two factors can also be grouped together by reason of the relationship existing between phagocytosis and the reticulo-endothelial system.

It may be noted that under the influence of radio-therapy a hyperæmia is produced at the site of the irradiated focus, and the resulting redness is the sign of vascular dilation. This hyperæmia provokes changes in the superficial and deep circulation; it can have effect on the inflammatory œdema and in a certain sense can act in the same way as "Stasis." The local necrobiotic action causes destruction of local infiltrations and this diminishes the tension and swelling in the treated area with corresponding diminution of pain. The results of histological researches and experiments made with small and moderate doses are interesting and may be stated as follows:

When weak doses were used no difference in the phagocytic activity of the reticulo-endothelial system was seen between the control animals and irradiated ones, whereas when moderate doses were used the phagocytic power definitely increased and with still larger doses it got diminished.

About 4000 cases of various types of inflammatory diseases were treated at the Barnard Institute of Radiology under my direction during the past 15 years.

In our experience such inflammatory conditions as unresolved pneumonia, post-pneumonic lung abscess, whooping cough; joint diseases such as post-operative inflammation, synovitis, arthritis; sinusitis; inflammatory conditions in the lymphatic glands acute and chronic as tubercular adenitis; affections of the nerves as sciatica, trigeminal neuralgia, post-herpetic neuralgia, Bell's palsy; pharyngitis, tonsillitis, catarrhal deafness, laryngitis, abscess, furuncle, carbuncle, whitlow, parotitis—both infective post-operative acute; calcification of supra-spinatus tendon and allied conditions; gas gangrene, cellulitis etc., treated early enough by a suitable dose of Röntgen rays respond, in a large proportion of cases, by a rapid diminution of pain and by resolution of the inflammation; in some of the above cases without suppuration but when the affected area is exposed to a similar dose after suppuration has started, although the pain is relieved more slowly, the suppuration is accelerated. When the inflammatory lesion is treated after suppuration has reached an advanced stage, little or no change occurs in the course of the disease.

As for the chronic inflammations which are known to benefit by irradiation, such as tubercular adenitis, sinusitis, synovitis, actinomycosis, sciatica etc., the pathologic circumstances are different as the leucocytic infiltration is less prominent and there is a pronounced feature of proliferation of connective tissues. When compared with leucocytes the connective tissues have such a low grade of radio-sensitiveness that they can well be classified as radio-resistant. This is what is actually seen in practice. The earlier the chronic inflammations are treated, the better they respond to radiotherapy. It is also our experience that in such chronic cases treatment must be repeated and larger doses have to be administered to obtain the maximum benefit. A careful analysis of the 4000 and odd cases treated during these years has convinced us that radio-therapy in the treatment of inflammatory conditions has a very useful and definite place. A suitable dose of X-rays given in time may save some lives, alleviate pain and distress in a large percentage of cases and in certain types of cases will make any other treatment unnecessary; but very often this method of treatment is not considered, as its positive efficacy is not appreciated until every other method has been tried and found to be of no avail. It is to be emphasized that it is only during the very early stage of acute inflammation that the maximum benefit from this treatment can be expected, but unfortunately patients are often referred too late when the conditions have progressed too far to secure the best results.

Post-pneumonic lung abscess.—**SIGNS AND SYMPTOMS**:—There is usually a history of high fever with cough and incomplete resolution resulting in a moderate degree of temperature going up to about 100°F with cough and copious foul smelling sputum, some pain in the chest, usually of some weeks' duration, sputum negative for tubercle bacilli, a mild degree of leucocytosis and anaemia, with a high erythrocyte sedimentation rate, loss of weight etc. An X-ray examination of the lung reveals an abscess cavity of varying size with fluid level and a certain amount of pneumonitis around the cavity.

TREATMENT:—A course of X-ray therapy to the affected area of about 10 sittings—five from the front and five from the back of the chest, each sitting of 100r on alternate days at a tension of 200k.v. at 50 cm.; focal skin distance and 0.5 cu and 1 Al. filter is the line of treatment adopted. A total of 1000r on the skin from the two fields and an effective dose of about 450r in the centre of the area treated is given. This is sufficient for an average sized patient. The skin dose should be decreased or increased according to the thickness of the chest so that the effective dose obtained at the site of the abscess is about 450 to 500r.

Improvement in the condition is noted by the temperature coming down to normal, and by a diminution of cough and expectoration noticed sometimes even after three or four sittings. Complete radiological resolution of the lesion may take from several weeks to months, but clinical cure as shown by the cessation of temperature and cough and sputum may often be expected within a week or two after the completion of the treatment. X-ray photos taken before treatment and six months after the treatment are given below to illustrate this: (See Fig. I and Fig. II)

Unresolved pneumonia.—**SYMPTOMS**:—Pain in the chest with fever and cough of a few weeks' duration. Examination of the chest would reveal an area of unresolved pneumonia. Blood will show a leucocytosis and sputum will be negative for tubercle bacilli.

TREATMENT:—A course of deep X-ray similar to that given in post-pneumonic lung abscess, but slightly smaller in total dose is given. This usually results in complete resolution of the pneumonia and the temperature settles down to normal with the disappearance of the cough; the blood picture returns to normal. The resolution of the condition as revealed by repeated X-ray examination is much quicker than in post-pneumonic lung abscesses.

Whooping-cough.—This is an acute specific disease of young children. Three stages of this disease are recognised:—Catarrhal, paroxysmal and convalescent. The first stage of the disease lasts for about 2 weeks and is accompanied by fever and severe respiratory catarrh. In the paroxysmal stage, the fever subsides but the

cough comes on in paroxysmal bouts with the typical whoop along with the attendant, distressing symptoms, such as the congested face, engorgement of the superficial blood vessels, eyes filled with tears, the child bathed in sweat and suffocation appearing imminent. During these fits of cough that often last for 2 to 3 minutes, the child may even faint or often get convulsions. The child may vomit and pass urine. Sometimes there may be even bleeding from the nose or under the conjunctiva. It is during this stage when the characteristic whoop comes on, that X-ray treatment to the hilar glands is most useful in alleviating the distressing symptom of cough, vomiting etc. A small dose of X-rays to the hilar glands relieves the irritation on the phrenic nerve and relieves these symptoms. The factors used are 150k.v. 40 cm. focal skin distance, ½ c.u. and 1.0 mm. aluminium filter and about 25r to 50r depending upon the age and general condition of the patient given on 3 or 4 successive days.

Peri-arthritis.—This is characterised by pain and stiffness in the joint which are progressive. Movement of the joint is restricted, and painful in all directions. There may be pain and tenderness on pressure over the joint.

TREATMENT:—A course of deep X-ray of 5 or 6 sittings each of 150r at 200k.v. and ½ c.u. plus 1 Al. filter, 50 cm. f.s.d. is advised which generally gives complete relief of pain and improvement of movements by 60% to 70% in every direction.

Osteo-arthritis.—Chronic pain is felt in joints, like the shoulder or the knee and is of fairly long duration with limitation of movements.

Examination:—Generally does not reveal any local swelling or tenderness unless there is some fluid in the joint but there may be at times a little atrophy of the muscles of the joint due to disuse. All movements of the joint are painful and restricted and is accompanied by some creeping. X-rays reveal osteo-arthritic changes.

TREATMENT:—A course of X-ray therapy of 10 to 12 sittings by two opposing fields over a period of about 3 weeks at 150 k.v., ½ cu. plus 1 Al. 30 cm., f.s.d. at 150r at each sitting—a total of 750r from each field is generally advised. At the end of the course, pain is usually relieved to a great extent. Sometimes it is useful to combine X-ray therapy with ultra-short-wave therapy. If this line is advised, the ultra-short-wave therapy should immediately precede X-ray therapy.

Calcification of supra-spinatus tendon.—The patient usually complains of acute pain in the affected joint and gross limitation of movements in all directions. The patient is unable even to put on a shirt. There is generally no swelling or effusion into the joint. Abduction of the joint is severely limited.

X-ray examination of the shoulder joint reveals an area of calcification of the supra-spinatus tendon. The skiagram of such a condition is given in *Fig. III*.

TREATMENT:—A course of X-ray therapy in combination with ultra-short-wave therapy is the treatment of choice for this condition. A total dose of 1500r in ten sittings over a period of about 3 weeks is recommended. This generally results in complete relief of pain and the range of movements increases to almost normal. X-ray examination at this time would reveal an almost complete disappearance of the calcification. X-ray pictures taken before and after treatment are shown in *Fig. III* and *Fig. IV*.

Sciatica.—The patient is generally middle-aged, complains of pain radiating down the thigh, and leg to the foot along the sciatic nerve usually of a few weeks' duration. On examination there is pain and tenderness along the sciatic nerve - gluteal region and back of the thigh radiating down to the great toe.

A course of X-ray therapy of about 6 sittings of 150r at 30 cm. f.s.d. and 5 cu. mm filter plus 1 mm. Al. is indicated. At the end of the course, the patient generally feels some relief and at the end of another three weeks he gets almost complete relief from pain.

Post-herpetic neuralgia.—This is an acute infection of the posterior root of the ganglion probably viral in nature, leading to severe pain along the distribution of the corresponding posterior root. The onset may be with fever lasting for 3 or 4 days. There is pain from the beginning and the eruptions appear as small vesicles filled with clear fluid. These dry up in a few days, the scabs drop off leaving a scarred area. The pain before and during the evolution of the vesicles may be very severe and is of a burning and itching nature, which may persist for months or even years.

TREATMENT:—A course of X-ray therapy of about 8 to 10 sittings over the affected nerve segments at 150r at each sitting, at 150 k.v. 5 cu. plus 1 Al. at 30 cm. f.s.d. gives relief of pain in about 75% of cases at the end of the course.

Bell's palsy.—Inflammation or compression of the seventh cranial nerve within the stylomastoid foramen is the cause of "Bell's Palsy." This nerve supplies all the muscles of the face. It is a purely motor nerve but the taste fibres which convey taste from the anterior two thirds of the tongue join it. Paralysis of the nerve may be caused by various other pathologies which must all be excluded. X-ray therapy is useful only when there is no evidence of an upper motor neuron-lesion.

TREATMENT:—X-ray treatment gives the best results if administered early in the disease, i.e., within 48 hours of its onset. A course of 3 sittings of X-ray therapy of 150r at 150 k.v. $\frac{1}{2}$ cu.

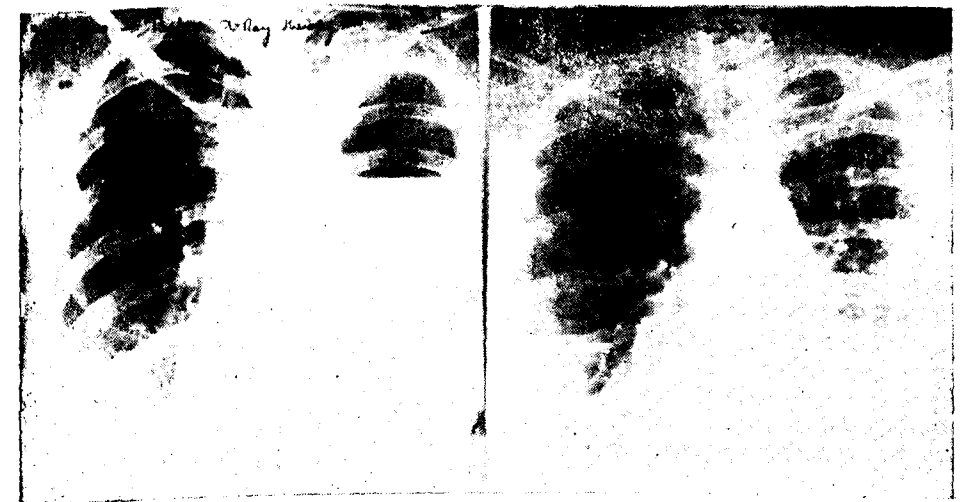


FIG. I. Post pneumonic lung abscess before treatment.

FIG. II. After X-ray Therapy. Note the complete disappearance of the abscess and the condition continues to be satisfactory. The X-ray photo was taken after 6 months.

[See page 430]

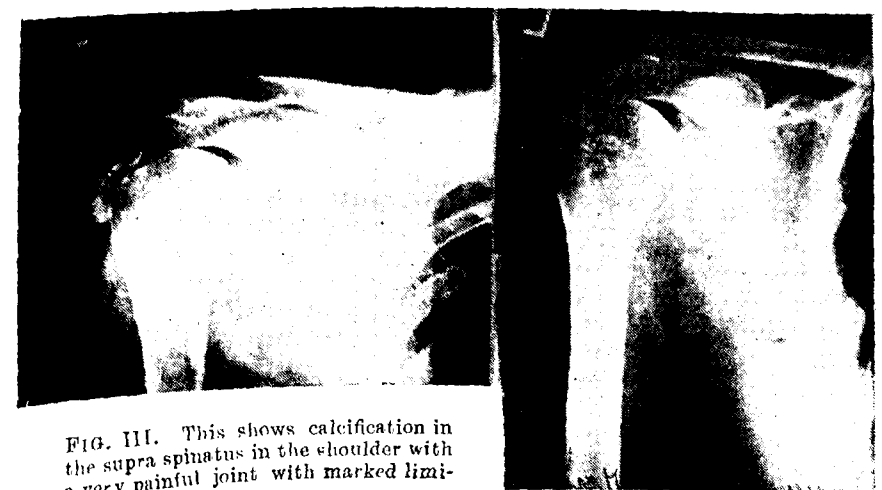


FIG. III. This shows calcification in the supra spinatus in the shoulder with a very painful joint with marked limitation of movements.

FIG. IV. The same after treatment, with almost complete disappearance of calcification, relief of pain and return of movements.

[See page 432]



FIG. V. Facial paralysis before treatment. Note inability of the right eye to close and the paralysis of the facial muscles and the disappearance of the naso-labial fold on the right side.



FIG. VI. After treatment. Is able to close both eyes equally and the return of the naso-labial fold on the right side.

[See page 435]



FIG. VII. Before treatment.



FIG. VIII. After treatment.

[See page 436]

plus 1 Al. 30 cm. f.s.d. should be given on three consecutive days on the affected side over the mastoid. If given early, the patient is generally able to close the eye completely at the end of this short course of treatment with re-appearance of the naso-labial folds and disappearance of the paralysis of the facial region to a large extent. See the clinical photographs taken before and after X-ray treatment in *Fig. V* and *Fig. VI*.

Eustachian tube catarrh.—The patient complains of defective hearing in one or other ear usually of a few months' duration. There is no history of any discharge from the ear. He is unable to hear when talked to, in normal tone.

TREATMENT:—The diagnosis that the deafness is due to an over-growth of lymphoid tissue around the eustachian cushion which blocks air-entry into the tube should be established before X-ray treatment is advised. X-ray treatment should be given to both sides and a course of six X-ray treatments of 150r each over a period of seven days with the usual factors is advised. An examination at the end of the course or a few days later generally reveals that the patient is able to hear well—even the tick of a pocket watch.

Carbuncle.—Before the discovery of antibiotics, the onset of a diabetic carbuncle was of serious import. There was nothing to stop the rapidly spreading infection except perhaps the surgeon's knife. X ray treatment, in our experience in the pre-antibiotic days was of immense use in arresting the spreading infection. Even after the advent of antibiotics, this line of treatment assists not only in the arrest of the infection, but also hastens the liquefaction of the necrotic tissues resulting in the formation of pus and its discharge.

TREATMENT:—A course of X-ray treatment, a total of 750r using the usual factors is given in 5 days. At the end of the course, there is great relief of pain and local tenderness with a tendency for the carbuncle to localize and form pus which later could be opened like any ordinary abscess. The action of X-rays in infections like this is either to abort the infections if given early or to localize it quickly. If given later in the course of infection, when suppuration is well advanced, not much benefit can be expected.

Cellulitis of the face.—On examination, there is swelling of the face of a few days' duration. There is usually a history that the trouble started as a pimple over some part of the face which was squeezed with the fingers, when it began to spread rapidly over the whole face.

TREATMENT:—A short course of 4 sittings of X-ray therapy at 90r per sitting, is generally sufficient to control the inflammation with disappearance of oedema of the face, eyelids, etc. and relief of pain. In our experience X-ray therapy has prevailed even when penicillin failed to control the spread of infection.

Hyperplastic tuberculosis of lymph glands.—The trouble starts with swelling over the neck, the axilla or the groin some times with pain. Both superficial and deep glands may get involved. A biopsy of the gland, to confirm tubercular lymphadenitis, is necessary before treatment is advised.

TREATMENT:—A course of deep X-ray of 10 sittings one each week at 150r at 150 k.e. and usual factors over a period of 10 weeks, gives the best results with almost complete resolution of the glands resulting in small fibrous nodules in the neck. If for any reason the patient is unable to stay for such a long period, then the whole course can be given in three to four weeks without materially affecting the result. (See *Fig. VII* and *Fig. VIII*.)

(To be continued).

RADIOLOGY IN THE DIAGNOSIS AND TREATMENT OF TONSILLAR HYPERTROPHY

Radiology, in the light of up-to-date notions on hypertrophy of the tonsils has a valid contribution to make, either in completing diagnosis, or for treatment. In the diagnostic field, to reveal, "hypertrophy of the pharyngeal tonsils" clinically "silent" or not sufficiently clearly definable with the rhinoscope and digital exploration: to demonstrate sinusitis (concomitant) with tonsils' hypertrophy and clinically obscure, or "silent"; to find "hilar or mediastinal enlargement also concomitant and clinically silent" (hyperplastic, or caseous) both in children, in the guise of adenoids, and in those who, after tonsillectomy continue to complain of general disturbances.

In the field of therapy: in the pædiatric ages and up to puberty, radiotherapy as a local treatment for diseases of the tonsils must be considered the "therapy of choice" and must be employed in the acute form and in subacute and chronic developments; in adults, on the other hand, it should be used as a "preventive treatment" to avoid or to facilitate an eventual surgical intervention; it is the only form of treatment in cases where the removal of the tonsils is contra-indicated.—(Sc, *Med. Ital.*, 3: 1, 1954).

THE DISADVANTAGES OF THOROTRAST

The use of substances opaque to roentgen rays is sometimes indispensable to the establishment of a diagnosis. Thorotrast has been and still is much employed, for it is apparently well tolerated and produces perfect roentgen negatives.

Dr. Albert Jentzer, Director of the Surgical Dept., of the University of Geneva, reports on his personal experiments, the clinical results of which prove that it is not really well tolerated and that Thorotrast has undeniable radioactivity, which lasts for years and is not eliminated or resorbed. Such permanent radioactivity must be considered a preliminary cause of cancer. Jentzer concludes that the use of this substance is to be avoided except, perhaps, in a few exceptional cases.

Other well known substances that serve the same purpose include Hepato-selectan of Degwitz, produced before the war by Schering. Jentzer has demonstrated the fact that Hepato-selectan has the great advantage of being immediately resorbed and eliminated. It is also free from toxic effects.—(*J. Internat. Coll. Surg.* 23: 1, Jan. 1955).

THIERSCH'S OPERATION FOR COMPLETE PROLAPSE OF THE RECTUM IN CHILDREN*

U. MOHAN RAO, M.S., F.R.C.S., (Eng.)

AND

R. NANJUNDA RAO, B.Sc., M.S.,
Madras

COMPLETE prolapse of the rectum (procidentia recti) in children is not uncommon. During the last few years on an average about 20 to 25 cases per year have been admitted for necessary treatment into the children's wards of the Government General Hospital, Madras.

In almost all these cases, reduction of the prolapse was easily achieved by simple pressure on the protruding mass by the thumb and fingers of a gloved hand. But recurrence of the prolapse both during and in-between the acts of defæcation was not so easily prevented. Mere strapping together of the gluteal folds with adhesive plaster alone was not successful, probably because of the lack of intelligent and patient guidance, and cooperation on the part of the parents. Two other methods of treatment had to be adopted for minimising the recurrence:— (A) Conservative and (B) Operative treatment.

A. Conservative (non-operative) treatment by the use of gallow's splint (Kini³).—In this, after the protrusion was reduced,



Fig. 1. Shows a child's inferior extremities suspended from a gallow's splint.

the buttocks of the child were strapped together posterior to the anal orifice, with adhesive plaster. The child was then put to bed in the supine position and its inferior extremities were flexed to a right angle at the hips and maintained in this position by strapping, and suspension from a gallow's splint (*Fig. 1*) as is

usually done in treating a fracture of the shaft of the femur in children. The gluteal region must be slightly raised from the bed.

As this position greatly minimized the effects of straining on the pelvic and anal regions during defæcation, subsequent acts of

*Specially contributed to the ANTISEPTIC.

defaecation were allowed only in this position. Probably gravity also helped in the treatment, not only by keeping the prolapsing mass reduced but also by spontaneously reducing any minor degree of prolapse that might have occurred during defaecation.

The child was kept in this splint and in this position for a minimum period of a fortnight.

This method, when carried out with constant attention to details and good nursing care, has given excellent results—both immediate and late. In our experience, operative procedures like rectopexy or rectosigmoidectomy (Irani²) that have been practised elsewhere from time to time were found to be unnecessary.

But there were a few disadvantages in this method:—

(i) Rest in bed was compulsory throughout the period of treatment. Hence continued hospitalization was required for a minimum period of 15 days.

(ii) The obvious discomfort of this position.

(iii) Constant nursing attention was necessary to see that the adhesive plaster in the gluteal region, that got soiled during defaecation was kept clean by frequent changes.

(iv) Occasionally parents and "affectionate" visitors, by tampering with the position of the child, prolonged the duration of the treatment.

B. Operative treatment—Thiersch's⁴ operation.—In the original Thiersch's operation carried out in adults, the recurrence of the rectal prolapse was prevented by narrowing the anal orifice. This was achieved by means of a buried subcutaneous silver wire which encircled the anal orifice in the perianal region. The wire was removed at the end of 2 or 3 months. The fibrous tissue deposited around the wire was expected to maintain stenosis of the anal orifice and thus prevent recurrence.

This method of treatment *did not give a permanent cure in all cases*. In some cases, the buried wire snapped, with recurrence of the prolapse. In others, the fibrous tissue yielded restoring the pre-operative patulous nature of the anal orifice thus facilitating the recrudescence of the original trouble. Further, as Moschovitz and Graham have so convincingly shown several procidentia recti in adults were in the nature of a sliding hernia and mere narrowing of the anal orifice cannot be sufficient.

Rationale for the use of Thiersch's operation in children.—It has been our experience as also the experience of several others that prolapse of the rectum in children was a temporary phase. The severe tenesmus associated with diarrhoea or dysentery, together with the lack of tone of the muscles of the pelvic floor, of the rectum and of the anal orifice, precipitated the prolapse. The temporary dehydration and malnutrition that were

met with in these conditions in these children aggravated the effect of the other precipitating causes.

Once these causative factors were removed or rectified, the large majority of children made a complete and permanent recovery from their condition of procidentia recti.

The temporary and completely reversible nature of the procidentia recti in children, made the condition a good indication for Thiersch's operation. Aird¹ referred to this operation so early as 1949.

Material used.—Since Thiersch's original operation where he used silver wire for narrowing the perianal region, many different materials like fascia lata, rubber bands, nylon etc., have been used in this operation. Among these, nylon, because of its pliability, tensile strength, ease of sterilization and almost innocuous nature in the tissues, appeared to us to be the most suitable.

Technique of the operation.—Under general anaesthesia and with the child held in the lithotomy position, and after the usual draping, the area including the protruded mass was cleansed. The

rectum was then pushed back into its normal position and the anal region was once again cleaned.

A big sized 3 circle curved cutting needle threaded with an 18" strand of nylon (size 7 N) was then introduced into the subcutaneous tissues in the perianal region. By alternate tunnelling and delivery of the needle (Fig. 2) the perianal region was completely encircled. The strand was then tightened, so that the anal orifice just admitted the index finger; the two ends of the nylon strand were then tied securely. *There was no necessity to bury the stitch or the knot completely.*

After a light aseptic dressing had been applied, the child was returned to the ward.

Post-operative care:—The anti-dysenteric treatment and the diet pertaining thereto that had been given in the pre-operative period were continued in the post-operative period also.

The child was up and about, on the evening of the same day or the next morning at the latest; and was discharged on the second post-operative day.

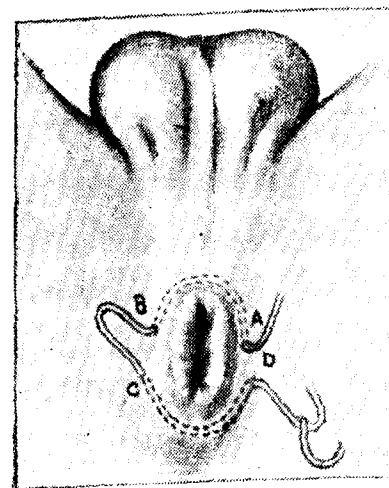


Fig. 2. The threaded needle is entered at point A and then is taken through the subcutaneous tissues and delivered out at B, the needle is then re-introduced into the subcutaneous tissues at C and delivered out at D. The anal orifice is thus encircled.

No special post-operative nursing was necessary; the dressings were changed every time the child had a motion and this change was easily carried out by the mother.

The perineal stitch was removed on the 15th post-operative day.

ADVANTAGES OF THIS METHOD:—This procedure greatly minimized the period of hospitalization and the nursing care that was necessary. The child was not in an uncomfortable head-low position and the method was "tamper-proof."

The disadvantage was that it required general anaesthesia.

ANALYSIS OF OUR CASES:—Total number of cases on whom the operation has been done so far is 10.

Age and sex:—All the children were in the first decade of life, the youngest being one and the oldest 8 years of age. Two were females and eight were males.

The causative factors in this group were diarrhoea and dysentery; other causes like whooping cough, phimosis, worms or vesical calculus were not present.

Mortality following the operation was nil.

Average stay in hospital in the post-operative period was 2 days.

Post-operative morbidity:—Apart from a very mild superficial sepsis in some of these cases, there was no post operative morbidity.

Follow-up was attempted in all these 10 cases.

The earliest case that was operated upon in July 1952, was seen in August 1954, and there was no recurrence.

Three other cases were operated upon more than a year ago; all of them are now doing well, free from recurrence.

Of the remaining six cases, one could not be traced; another child died with no recurrence of the same complaint two months after discharge from the hospital. The others are free from recurrence and quite healthy. The tenth case was done only a month ago and though the immediate result has been very satisfactory, it is too early for a long term follow-up. The results in the entire series, taken as a whole, are thus found to be quite good.

Summary.—(1) The technique of the "gallow's splint" method of treating acute prolapse of the rectum in children is briefly described. The disadvantages of this method are mentioned. (2) The rationale for the use of Thiersch's operation in children is discussed. The technique of the operation is described. (3) The results in ten cases treated by this method are presented.

Acknowledgement.—Our thanks are due to the staff of the Paediatric Department of the Government General Hospital, Madras, for their willing co-operation. We also thank the Dean of the Hospital, for permission to publish this paper.

References:

1. Aird, I. (1949)—"A Companion in Surgical Studies," E and S. Livingstone, Edinburgh, p. 754.
2. Irani, R. A.—"Prolapse of the Rectum in Children," Ind. J. Surg., 15: 43-45.
3. Kini, M. G.—"Prolapse of the Rectum in Children and the role played by the gallow splint in the cure of this condition," Ind. Med. Gaz., 75: 728-729.
4. Thiersch, (1914)—Referred to in "Rectal Surgery" by W. E. Miles Cassell & Co. Ltd., London p. 173.

SOME FEATURES IN THE DEVELOPMENT OF DYNAMIC PSYCHIATRY IN THE UNITED STATES*

LEON J. SAUL, M.D.,

Professor of Clinical Psychiatry, University of Pennsylvania, Philadelphia-4

AND

ANDREW S. WATSON, M.D.

OF the many changes that have taken place in psychiatry in the past decade, perhaps the most important is the emergence of the science of *Psychodynamics*. Its subject is the interplay of motivational forces in human beings and other biological organisms, especially as seen through and reflected in the mind. It deals not only with the *what* but also the *why* of behaviour. Psychodynamics recognizes that present behaviour is much motivated by patterns from the past which are, to a large extent, unconscious. It is a predictive science and is beginning to learn how to quantitate emotional forces. It is derived chiefly from psychoanalysis with a growing tendency to utilize the knowledge and techniques of anthropology, physiology, psychology, sociology and other fields. As *psychodynamics* permeates psychiatry a truly "dynamic psychiatry" has been developing. "Because of its singular value for the understanding of human behaviour, psychodynamics must take its place in medicine as a basic science."¹⁶

It was chiefly Sigmund Freud's pioneer work in the study of the personality that set the stage for most present-day psychotherapeutic methods and most psychodynamic knowledge. Freud explored man's unconscious mental processes and clarified the manner in which primitive motivations are modified and controlled by the ego as it is developed and educated by one's social impulses and experiences (super-ego). Let us sketch some of the influences which have affected the development of psychoanalysis.

Psychoanalytic work started and was developed outside of the universities. This tended to remove the infant field from the critical interchange which is present in academic centres, and there was less opportunity for mingling with workers in other disciplines.

There was early hostility toward and from official medicine. Because of it, some of the brilliant persons with whom Freud worked were laymen. This tended further to drive a wedge between psychoanalysis and medicine.

A great deal of the pressure and criticism brought to bear on the early analysts was of an emotional nature. The result was to make the group defensive about all criticism, with a tendency to undervalue even legitimate criticism as "resistance."

Many students of psychoanalysis sought out this field in the hope of solving their own problems. This too was inevitable and,

* Specially contributed to the Golden Jubilee issue of the ANTISEPTIC

while it resulted in much especially brilliant work, it also brought in certain emotional attitudes which tended to produce problems later on.

Such factors, among others, tended to isolate the new science, which developed the character of a "movement" with a sense of special knowledge and of mission. This zeal facilitated intensive, uninterrupted work, but it also introduced problems which made its assimilation with medicine and the family of sciences difficult.

The field of psychoanalytic psychiatry began with intensive observation of individual persons in a clinical setting. Later there developed a tendency to teach theory first and then to "apply it" to clinical observations and to make it a test of whether or not a person was a true psycho-analyst. Today, the trend is to test theory by facts through further clinical observations and experimental methods.

Personal analysis has proved to be an indispensable essential in the training of analysts. But this special feature of psychoanalytic training, peculiar to this field, has also created problems. The analytic relationship, due to its nature, puts great responsibility on the maturity of the analyst. The student's former submissiveness to his parents develops towards the training analyst, thereby enormously magnifying the analyst's authority. This makes it easy enough for him to leave his analysands as dependent, idolizing followers. The challenge is to produce mature, objective, emotionally free individuals who can realize most fully their own cal and scientific world, and can enjoy giving of their best to their work, families and friends and to human society in general.

Several features of the early content of psychoanalysis had important effects upon its subsequent development.

In his first observations Freud was greatly impressed by the prominence of sexual matters in the problems of his patients. As he continued his work, he gradually broadened the meaning of sex to include both love and sensuousness. It almost became the equivalent of all pleasure; later he saw it as part of the unifying force of all life, Eros.

This introduced problems as well as simplifications. The term "sex," as used in the literature, not infrequently confused genital sensations with sex in the broadest sense. Further, if all pleasure is sexual, basically in connexion with the mother, with father as the rival (for the male), then every investigation could only lead to the oedipus complex. Such thinking is both stimulating and confining. This is not to deny the importance of the oedipus complex, which is an expression towards the parents of infantile elements of an underlying sexual attraction and rivalry seen in many animal forms.

Another important effect of the early focus upon the libidinal desires was to overlook and underestimate the importance of

hostility (termed "aggression" in the literature). Late in his life, Freud expressed astonishment that he and his followers could so long have failed to recognize the central significance of this fateful reaction. It is fortunate indeed that Freud made this statement (in "Civilization and Its Discontents") for, if he had not, it would have further delayed the inclusion into psychodynamic theory and practice of this emotional response which is so vitally important, not only in all psychiatric conditions but in all aspects of man's mental and emotional life and in personal and social behaviour.

Through a remarkable feat of observation and interpretation Freud was able to include a vast range of psychological phenomena within his "libido theory." But his early formulation, although loosened and expanded by Freud himself,⁷ led in part, amongst some of his followers, to operating within a rather rigid, stratified concept of the psychic life. Recently this horizontally-stratified picture of personality has been altered to include continuing forces such as dependence and to utilize observations from physiology, psychology, and other fields which must ultimately be included in the understanding of human behaviour.

The interest of analytic psychiatry has widened from what the basic instinctual forces *are* to *how* these forces are handled by the rest of the personality. When this trend first appeared, there were many who believed that this was a turning away from the essentials of psycho-analysis.

However, it was Freud's daughter, Anna, who made the first great contribution in this direction with her book, "The Ego and the Mechanisms of Defence."⁸ In this book she described the functioning of the ego and the way in which it mediates the activity of the instincts and the conscience in relation to the outside world. She emphasized the fact that it is through the understanding and alteration of these ego forces that therapy takes place, and not primarily by the resurrection of infantile fantasies. In other words, everyone has all sorts of infantile impulses, libidinal and hostile, and the big differences between individuals lies in how each handles these motivations within him; yielding to them and becoming criminal or perverted, fighting them unsuccessfully and developing neurotic or psychotic symptoms—or mastering and sublimating them to become strong, gentle, constructive responsible mates, parents and citizens.

Another change in emphasis is toward viewing the personality more fully in its broader social relationships. Experience in the last war proved that each person has specific vulnerabilities to specific emotional stresses. To treat these individuals one must fully understand these weak points in their personalities and the background experiences which determined them as well as the particular current stresses which act upon them.¹⁷

The concept of personality is also being broadened and deepened, by the many character neuroses which are treated today. Attention is expanding from concentration on certain symptoms to a study of the total personality with increasing interest in the nature of maturity and in the pathways toward achieving it.

In the past, analysts when treading upon new and dangerous ground, felt that they had best be no more than a blank screen upon which the patient projected his fantasies, ideas and feelings. Now realization is increasing that the main part of the therapeutic goal is for the patient to outgrow or better handle powerful emotional forces, shaped by childhood conditioning influences, in favour of freeing the mature attitudes and motivations of his personality. Hence therapists are exploring methods for assisting in this process. Freud led the way in this by pointing out that the process of cure in analytic treatment is a form of "after-education" to correct the "blunders of the parents". Alexander calls their disconditioning and reconditioning process "the corrective emotional experience."¹

These developments have increased therapeutic effectiveness and have removed some of the aura of mystery from the practice of psychiatry. The patient's emotional problems are dealt with mostly as problems in *interpersonal* and *social* adjustment as well as in *intrapsychic* adjustment. They result from faulty conditioning which must be corrected through emotional re-education. This re-opens the development to maturity which is essential both for the good spouse, parent and citizen and for inner peace and security.

The evolution of analytic treatment has been depicted by Alexander and French² as falling into five main historical periods; (1) cathartic hypnosis; (2) waking suggestion; (3) free association; (4) transference neurosis; and (5) emotional after-education.

In the early years of psycho-analysis, there was a natural tendency to select patients to fit this new technique. Since part of the technique, growing out of Freud's previous use of hypnosis, consisted of daily interviews with the patient free-associating while lying on the couch, there were a great many patients who could not be helped, and, indeed might even be rendered more ineffective by such an approach. This led to experimentation with new techniques and searches for modifications which would shorten this long, cumbersome method. A great deal has now been learned and treatment through insight into the total personality and its relations with others, utilizing the transference, is now more accurate, sure and flexible and the range of persons who can be helped by dynamic psychotherapy has been greatly widened.

Also, there has been a growing awareness on the part of the public that the psychiatrist who is trained in psychodynamics is not concerned only with the "insane." In fact, the whole focus of psychiatry has shifted to the everyday problems of everyday people.

Analytic psychiatrists specialize in psychosomatic problems, difficulties in marriage, career, and so on. Even psychotic symptoms have become largely intelligible in these terms, as have criminal behaviour, alcoholism and other widespread disorders of behaviour. As a result the stigma attached to seeing a psychiatrist is diminishing and a much greater variety of patients come to the dynamic psychiatrist for understanding and treatment.

All of these factors mean that the analytic therapist must call forth and possess much greater skill and flexibility than formerly when his work was limited to the classical neuroses and the mechanics of his technique were fixed. Freud himself anticipated this when, in 1910, he wrote: "We are...now coming to the opinion that the analytic technique must undergo certain modifications according to the nature of the disease and the predominating instinctual trends in the patient..." In 1919 he stated: "We are ready to admit incompleteness of our understanding, to learn new things and to alter our methods in any way that yields better results."³

Just as in other specialities, the more experienced the therapist the more he has mastered the understanding of the interplay of motivation (*i.e.* psychodynamics), the more varied are the techniques which he can employ effectively. From experimentation and study during the last fifty years, there is gradually emerging a type of *analytically based therapy* which is more accurate, smooth, rapid and effective.

As the concepts of analytic psychiatry developed and were subjected to tests they were found applicable to other fields such as physiology, anthropology, clinical and experimental psychology, and education; and the contributions of these fields, in turn, led to the gradual integration of the related knowledge and concepts.

To describe this process at length with suitable examples would carry us far beyond the limits of this paper. However, a few illustrations may be given. In clinical psychology, dynamic concepts and therapeutic methods have been developing, based upon the understanding of human motivations. Experimental psychology has contributed by testing the findings of psychodynamics, and also through the introduction of clinical tests, such as the Rorschach and H. A. Murray's Thematic Apperception tests both of which were developed from psychoanalytic concepts and have proved to be valuable in clinical diagnosis.

Understanding of the super-ego, that is the part of the personality which is the result of training and which contains social motivations, has been broadened by collaborative work with anthropology. Such work has extended our concept of human nature and thrown light upon the behaviour of people in different cultures and upon continuation of cultural patterns in the bringing up of children.

This interaction with anthropology and also with sociology has stimulated a trend known as "social psychology." These contributions deal with man as a social being and with the behaviour of groups. They should help greatly in lessening man's inhumanity to man.

Animal psychology, especially the work of Pavlov and Cannon and their disciples, has contributed much to the understanding of human beings. Pavlov's work showed the effect of conditioning and thus thrown light upon the super-ego, that is, upon the results in the adult of the ways in which he was treated during his earliest formative years. The work of Cannon, especially his concept of the fight-flight reaction and of homeostasis, has provided an understanding of fundamental mechanisms operative in the human organism. At the same time, our understanding of people is being tested by experimentation with animals.¹⁴ Behaviour observed in human beings is reproduced in animals in order to elucidate the motivation involved. The effects of stress and the physiology and pathology of adaptation to it in human beings is being studied experimentally in animals.¹⁵

The interaction of medicine and dynamic psychiatry is well-known through the development of the whole field of psychosomatic medicine with its own scientific journals. This field represents a unification of understanding of the human organism by combining knowledge about him derived from all levels, from the highest psychological down to the lowest structural, from his highest feelings down through to the behaviour of his organs and cells.

Education is also involved in important ways with the newer knowledge of human motivation. About 600 psychiatrists in the United States act as consultants to colleges and universities. Courses are being introduced at all levels of education from nursery school through graduate schools to deal with the emotional development. It is being increasingly perceived that education which deals only with the intellect is incomplete. Education which includes education for living, is of fundamental importance. The educator's observations of students of all ages is contributing to a better comprehension of their development, motivation, and behaviour and to further understanding of the learning process. Analytic treatment itself is a form of learning—reopening the learning of mature attitudes so that the adult can enjoy working and loving.

In recent years publications have appeared on the connexions between dynamic psychiatry and politics, economics and religion. In various centres, seminars are held for mutual discussion between dynamic psychiatrists and clergymen. In the universities there is a tendency to develop multi-discipline projects for teaching and research which include psychiatrists and representatives of all the different social science departments within the college or university.

The mutual interaction of dynamic psychiatry with these inter-related fields is leading to a more comprehensive picture of man as a psychological, biological, social organism and to the hope that this knowledge will be applied practically to shape a more peaceful world and provide more satisfying and effective human living than we and our children now face.

In the United States psychiatry is an accepted medical specialty, and it is the overwhelming opinion of the American Psychoanalytic Association that it should remain based in medicine.

In over twenty medical schools in the United States the professors, as well as many or most of the staff, are trained psychoanalysts. Many of the large hospitals have organized their psychiatric services along analytic lines. Other schools and hospitals do not have many trained analysts but are also dynamically oriented.

The scientific papers on dynamic psychiatry increasingly present valid data with adequate controls. Some fear that psychoanalysis is threatened with loss of identity. This is far from the case—the American Psychoanalytic Association was never so vigorous or so rapidly expanding. Integration between sciences has always served to strengthen and mutually benefit them.

Quantitative measurement is one of the ultimate goals of all sciences, but a difficult one to achieve when dealing with psychological data. It may be well to conclude this survey with an example of such work.

In a recently reported study by the senior author,¹⁹ an effort was made to estimate quantitatively *hostility* as it appears in the manifest content of dreams. The subjects for this study were a group of hypertensive patients and a group of healthy college students who were used as controls. The degree of hostility was arrived at by taking the consensus of a group of psychiatrists, internists, psychologists and social workers as to the intensity of the hostility in various manifest dream elements. By arranging the dream elements in the order of diminishing intensity of hostility, a six-point scale was developed.

The dreams of the patients and the controls were then rated according to this scale. The rating was done by three judges who were trained in the use of the scale without knowing from whom the dreams came or what the purpose of the study was. It was found that all the judges ranked the dreams in essentially the same way. (In comparing the group of hypertensives with the controls, the difference of the means in the level of hostility was significant at better than the .001 level, according to the method of testing such samples).

Thus, it appears possible to differentiate the hypertensives from the normotensives by the amount of hostility in the manifest content of the dreams, as measured by this scale. Although the

samples were not precisely matched, the results seem to show that such scales can be developed for estimating hostility and other motivational forces such as dependence and activity; and also to show how the person's conscience reacts to these motivations and how the ego handles them. Such scales can be applied to other data besides dreams. They should prove useful: (1) as a method for the quantitative study of motivations and tensions in human beings, (2) for further understanding of hypertension and other psychosomatic conditions and (3) for applications to diagnosis and therapy.

Conclusions.—Psychiatry has moved from preoccupation with description and classification of the psychoses toward understanding human motivations as these produce symptoms and determine human person, interpersonal and social life with all its variety, conflict and violence. This knowledge of psychodynamics derives chiefly from psychoanalysis but, includes more and more, the contributions of inter-related fields. Those psychiatrists who operate chiefly with such understanding of motivation are 'dynamic' in their orientation.

Contributions to dynamic (*i.e.*, motivational) understanding come from clinical psychologists, experimental psychologists, anthropologists, biologists, physiologists, sociologists, educators and others. The direct observation of children and infants and students of all ages broaden our understanding of health and maturity. Economics is giving depth to the picture of group and national social processes which, in an indirect and long-term fashion, alter the environment which, in turn, affects the development of personality. Whatever bends the infant twig affects the adult tree.

As psychiatry becomes more dynamic, more concerned with human motivations in all their aspects, as it integrates with the knowledge of psychoanalysis and the many other inter-related, rapidly growing fields, we may hope that its contributions will help mankind. Through knowing themselves better, people should rear their children better, and help them to mature more fully and thus prevent the widespread warping of their development, which is the greatest single cause of hostility, violence and war. Hate and cruelty will be overcome only as children develop properly from conception and are socialized gradually without antagonizing and warping them. Thus, dynamic psychiatry can help build generations in which adults realize their true human nature and reach their full human stature.

Bibliography:

1. Alexander, F. and French, T., (1946)—*Psychoanalytic Therapy: Principles and Applications*, The Ronald Press Co., New York.
2. Alexander, F. (1948)—*Fundamentals of Psychoanalysis*, W.W. Norton & Co., New York.
3. Alexander, F. (1950)—*Psychosomatic Medicine: Its Principles and Applications*, W. W. Norton & Co., New York.
4. Erikson, Eric, (1950)—*Childhood and Society*, W. W. Norton, New York.
5. French Thomas M. (1933)—*Am. Jour. Psychiatry*, *XII*: 6.

Bibliography—(Contd.)

6. Freud, Anna, (1946)—*The Ego and the Mechanisms of Defense*, International Universities Press, Inc., New York.
7. Freud, Sigmund (1933)—*New Introductory Lectures in Psychoanalysis*, W. W. Norton & Co., New York.
8. Freud, Sigmund, (1949)—*An Outline of Psychoanalysis*, W. W. Norton, New York.
9. Freud, Sigmund, (1933)—*Training in the Ways of Psychoanalytic Therapy*, Collected Papers, Vol. II, Hogarth Press, London.
10. Freud, Sigmund (1933)—*Future Prospects of Psychoanalytic Therapy*, Collected Papers, Vol II, Hogarth Press, London.
11. Fromm-Reichmann, F. (1950)—*Principles of Intensive Psychotherapy*, University of Chicago Press, Chicago.
12. Grotjahn, M. and Gabe S. (1953)—*Psychotherapy—Outline of its History and Present Situation*, Modern Abnormal Psychology, philosophical Library.
13. Jones, Ernest, (1953)—*The Life and Works of Sigmund Freud*, Basic Books Inc., New York.
14. Masserman, Jules, (1953)—*Internat. Jour. Psychoanal.*, *34*: Supplement, pp. 1-30.
15. Oberndorf, Clarence, P. (1953)—*A History of Psychoanalysis in America*, Grune and Stratton, Inc., New York.
16. Rado, Sandor, (1946)—*Am Jour. Orthopsychiat.*, *33*: 405.
17. Saul, L. J. (1947)—*Emotional Maturity*, Lippincott Co., Philadelphia.
18. Saul, L. J. (1951)—*Bases of Human Behaviour*, Lippincott Co., Philadelphia.
19. Saul, L. J., Sheppard, R., Selby, C., Master, J. and Sachs, D. (1953)—*An Attempt to Quantify Emotional Forces Using Manifest Dreams:—A Preliminary Study*, Presented at meeting of American Psychoanalytic Association, New York (to be published).
20. Selye H. (1950)—*Stress: A Treatise based on the concepts of the general adaptation syndrome and the disease of adaptation*, Montreal Acta Inc.

Highland Avenue,
Media, Pa. (U.S.A.)

THE AIM OF PSYCHOANALYTIC THERAPY

Within the broad expanse of the discipline of medicine, which aims at the preservation and restoration of health and the prolongation of life, there exists the subdivision of psychiatry whose special field of endeavour is the furtherance of mental health. With the continuing refinement of psychoanalytic technique and the ever accumulating insight into human nature which has resulted therefrom, psychotherapy has achieved a direction and purposiveness which justify its claim as a logical method for the treatment of personality disorders.

While it is plain that, in greater or less degree, the psychoanalyst has been successful in finding practical methods of presenting both to himself and to his patient the aims of the psychotherapeutic endeavour, it seems highly desirable to have a simplified statement of goal to which both patient and physician can subscribe, comparable to that of general medicine, *viz.*, health. Such a simple statement of the hallmark of the well ordered mental economy, which is acceptable to both physician and patient, which is in fact constantly striven for in all psychotherapeutic endeavours, is the achievement of *happiness*.

No matter what the source of our knowledge about the nature of happiness and the various paths to its attainment, it is the particular task of the psychoanalyst to make this information available to his patient in such a manner that the latter can apply it practically, and in so doing, the psychoanalyst must take into account, and overcome, those factors in the illness of the patient which have made it impossible for him to help himself.

The aim of the psychoanalyst, briefly stated, is to reorient the forces operative within his patient's personality so that they tend consistently to produce a state of happiness; the psychoanalyst should know clearly what he means by happiness and how it can be reached. Expressed in terms of the topology of the personality, happiness means that the instinctual impulses which arise from the id encounter the approval, by and large, of the ego which is eager to facilitate the fulfilment of these desires with all the energy at its disposal, since it operates

under the beneficent approval of a permissive super-ego and with the hearty concurrence of an encouraging ego ideal whose reasonable aspirations it is attempting to consummate. It is the aim of the analyst to assist his patient in the development of this type of functioning. As stated by Appel, "The mature citizen is one who finds his individuality, expresses it, delights in it, in performing services which are contributing, necessary, and acceptable to society. This is the goal of any psychiatrist in his practice."

During the course of psychoanalytic treatment, the patient, on his part, must ascertain the truth about himself in several important areas. Ultimately the most important truth to him is that which comes from an intimate knowledge of his talents and a realistic appraisal of his capabilities and potentialities for growth. Before he can acquire a more or less complete appreciation of his own assets and media for self-expression, it will be necessary for him to understand, *pari passu*, the nature of the forces which have hindered and obstructed the free exercise of his abilities in the pursuit of happiness. The patient's conscious appreciation, the forces which obstruct their functioning, because in large measure his knowledge of his abilities has been carried down into repression along with the prohibited instinctual impulses which are condemned by the superego.

The goal of psychoanalytic treatment, briefly stated, is the achievement by the patient of a durable state of happiness in so far as reality permits, and this is, and the largest possible amount of energy available for, the constructive use of the patient's talents and abilities, particularly in their highly individualistic features. The state of happiness from which the patient seeks relief, is brought about by those factors which restrict his freedom in this type of functioning and reduce the energies available for constructive activity by the need to maintain the restrictive forces in a vigilant and effective state while simultaneously the fight against them is carried on. The turning of instinctual energies against the ego, the laying down of the infantile superego, even if this was originally intended to curb only undesirable activities. The degree of damage sustained in this manner varies greatly from person to person. Bringing the infantile superego into consciousness, with the intention of altering it in the direction of greater leniency and abolishing some parts of it, liberates energies which then become available to the ego for other purposes conducting to a state of happiness. The critical function formerly exercised by the infantile superego, producing anxiety and guilt when the ego contemplates engaging in certain socially undesirable activities, can then be taken by the ego itself, and when this becomes automatic, a new inhibiting agency has been formed which may be spoken of as the adult superego, in contrast to the infantile. This new agency is much more effective than the former, and much less susceptible to corruption, simply because it has much less to do and because its activities are approved of by the ego. The chief distinction between the adult and the infantile superego is that the ego is in a state of active co-operation with the former, while it is largely in a state of continuous conflict with the latter. The adult superego is that into action only at moments when the ego tends to lapse from its customary behaviour of functioning constructively, and these moments are rare when the individual is generally happy and not frustrated. It is obvious that the effect of infantile superego in producing unhappiness varies greatly from individual to individual, but that it has this effect universally, in some degree at least, is probably in large part responsible for the oft repeated statement that all people have some neurotic tendencies.—(*Am. J. Psychotherapy*, 9:1, Jan. 1955).

Medicine, to produce health, has to examine disease.—(Plutarch).

The more we study, the more we discover our ignorance.—(Shelley).

TREATMENT OF RHEUMATISM AND ARTHRITIS WITH INDIGENOUS DRUGS*

M. V. BANSOD, M.S.,
Honorary Surgeon, Department of Surgery,
B.J. Medical College and Sassoon Hospitals, Poona

Introductory.—Rheumatism—arthritis has been a perennial problem all over the world for which an adequate answer has not yet been found. It has been a serious drain on national economy. The chief reason for its not having caught the public fancy and secured publicity in the lay press, as cancer, tuberculosis and poliomyelitis have done, is that while it is a crippling disease, it does not kill. The magnitude of the problem will be readily apparent from published reports of its high incidence in Europe and America. Holbrook and Hill estimated that 7½ million people suffer from chronic rheumatic disease in U.S.A., and that rheumatism and arthritis cause more disability and crippling than all accidents combined. Lord Horder found that in Great Britain one in every fifty of the population suffers from chronic rheumatism.

The present study relates to a mode of treatment of this condition particularly suited to our country. The problem of chronic rheumatism touches many fields in medicine. Because of the wide disturbance of physiology caused and the secondary invalidism consequent on it, no single or specific measure can secure complete amelioration. Patience and perseverance are essential. The treatment should comprise:—(1) Physiotherapy: (a) physical therapy, (b) massage and (c) exercise. (2) Occupational therapy; (3) Orthopaedic management; (4) Attention to diet; (5) Psychotherapy; (6) Supportive therapy and finally, (7) Drug therapy.

In our present study we have concentrated mainly on "Drug therapy." The number of drugs that have been used is legion. In Indian medicine, two drugs have been used with good results in the treatment of rheumatism *i.e.* Mahayograj Guggul and Maharasnadhi Quath. The third drug that has been very successfully used in chronic rheumatism till recently is gold. In fact, before the dramatic advent of cortisone, gold was our sheet anchor in the treatment of many cases of arthritis and rheumatism.

We have in this study, 70 cases of chronic rheumatism and arthritis, treated with a combination of gold, Mahayograj Guggul and Maharasnadhi Quath.

Our 70 cases comprise 19 cases of sciatica, 15 of fibrositis, 11 of sciatica with fibrositis, 13 of osteo-arthritis, 10 cases of osteo-arthritis with sciatica, and two cases of rheumatoid arthritis. Twentysix were males and 44 were females. Among the predisposing factors, fatigue accounted for 12, cold for 23, fatigue and cold for 14 and injury for 5 cases, making the total of 70 cases.

As regards the relation of the rheumatic and/or arthritic condition to the foci of infection, 18 had septic teeth, 6 septic tonsils, another 6 had sinus infection,

* Specially contributed to the ANTISEPTIC.

while 2 had cervix infection and four had bowel infections making a total of 36 out of 70.

The investigations, carried out (laboratory and roentgenographic) revealed that 37 had a normal ESR while 33 had an elevated ESR. The X-ray pictures revealed a normal state in 40 patients; eighteen showed osteoarthritis and rheumatoid arthritis and nine had sacro-iliac arthritis. Spondylolisthesis, sacralization and disc-prolapse were each noted in one case.

The drug used in treatment was the same in all cases, *viz.*, the compound already referred to on page 451 *supra*; 64 received 3 doses a day and 6 had four doses daily. There were no complications or after effects (following the use of the drug) in 67 cases, while only two had diarrhoea and one complained of renal irritation.

As regards response to treatment, sixteen showed quick dramatic results and 41 progressed slowly; 9 showed a moderate response while only 4 responded poorly.

The period of remission following the treatment varied from 2 to 7 months as shown below:—

Period of remission	No. of cases
7 months	4
6 months	8
5 "	12
4 "	15
3 "	19
2 "	9
no relief at all	3
	70 cases

Supportive therapy had to be given to 41 patients; 16 received vitamin therapy and injections of liver extract, 24 were treated for the removal of septic foci, two received special diet and two others had to be given analgesics.

Discussion.—In our search since 1948 for a remedy which will offer a cure for or will reasonably relieve cases of osteo-arthritis, we came across this indigenous product for which we decided to try.

Our treatment of osteo-arthritis between 1950 and 1953, with this compounded product yielded variable results. Some cases gave surprisingly good results while others showed none at all. The cases which responded were characterised by long remissions and no side-reactions. Since then we have been trying it in all cases and types of chronic rheumatism. In some cases, the results were gratifying, so that we planned a comprehensive research this year and analysed and studied all cases treated with this preparation. The components of which are:—

Mahayograj Guggula:—Charak used Yograj Guggul in combination with Rasana for rheumatism and sciatica. The combination

is strongly recommended in Sharangdhar Samhita (Part II, Ch. 7, Sl. 84-97). It contains about 29 different ingredients, 21 herbal and the rest 'bhasmas.' It is held in high esteem in the treatment of rheumatism, neuritis, nervous disorders, and dyspepsia. It is a nervine and hæmatinic tonic. It is believed to increase phagocytosis and the resistance of the individual.

Maharasnadhi Quath which is prominently mentioned in Sharangdhar Samhita, contains 23 herbal ingredients. It is used essentially in acute muscular rheumatism, inflammation of the joints, sciatica, paralysis and also as a digestant and tonic.

Gold bhasma:—Gold seems to have long dominated the therapeutic conception of the old masters, and has been prominently advocated by Charaka, Sushruta and Vagbhata in their respective works. Gold was regarded as the 'Elixir of life.'

Even today, gold therapy is reckoned to be a very efficient allopathic treatment in arthritis, probably second only to cortisone. According to a report from the Association of Rheumatic Diseases of America, gold therapy has given good, and fairly lasting results in 60% of cases of rheumatoid arthritis.

It was therefore, reasonable to expect that a combination of Mahayograj guggul, Maharasnadhi quath and Gold bhasma, used in judicious proportions would give encouraging results in many cases of chronic rheumatism and arthritis. So we have used such a combination in 70 well-investigated cases and followed them up for about 7 months, and the results of these investigations have been detailed *supra*. Dealing *seriatim* with the conditions thus treated:—

1. *Sciatica and fibrositis* are the commonest and most annoying conditions which incapacitate an individual quite often and without warning. In our series we found that cold draughts, fatigue, and septic foci, are contributing causes to a large extent. Possibly rheumatic diathesis and psychogenic factor (Halliday) also play some part.

In our series, best results were obtained in cases of severe fibrositis and sciatica. The response was quick, often dramatic and the remission prolonged. Additional treatment for the removal of septic foci may be necessary. In some cases the E.S.R. was raised but in almost all cases the X-rays were negative. The differential diagnosis of fibrositis and sciatica from other conditions of low back pain, is always difficult. Before diagnosing a case of fibrositis and sciatica of rheumatic origin, one must clearly appreciate the numerous causes of low back pain.

It is only in such cases that we tried this Ayurvedic preparation with significant success. It is in this common, painful, and chronically incapacitating malady that this drug was found to yield better results than other forms of therapy.

2. *Osteo-arthritis or degenerative joint-disease* is another very common condition noticed in our country, and it is for the treatment of this complaint particularly that we started the search for a reliable potent remedy. Since 1949 we have used this in hundreds of cases with varying results: in some they were very encouraging, and in others totally disappointing. In the present series, however, the results were promising. Further research in this direction will be necessary before a final verdict can be given. Deep X-ray therapy and injection of (intra articular) hydrocorton which are now very much in use are potent rivals to this indigenous product.

3. *Rheumatoid arthritis*:—Fortunately this disease is rare in our country. We treated only two cases of rheumatoid arthritis with this drug and in both the results were encouraging, and sufficiently impressive to warrant further trial. In one case this drug helped, where phenylbutazone and cortisone had totally failed. Other allopathic physicians in Bombay also appear to have found this drug useful in rheumatoid arthritis.

With the introduction of cortisone the treatment of arthritis has entered a new phase. But in dealing with drugs like cortisone and phenylbutazone or for that matter even gold (by injection), continued medical supervision with frequent laboratory tests are essential, to prevent serious side-effects and control unexpected complications. They should therefore, be used with a full knowledge of their dangerous side-effects. The indigenous compound used by us in this study, is comparatively free from such risks and can be handled with greater ease and without the need for constant medical supervision. It has in addition, very definite tonic properties which would conduce to the general well-being of the patient. Even when given over a prolonged period, it does no harm, and so we have used it for two, three and even four months without any ill-effects.

Another point which is of much more and supreme importance as regards our poor country, is the question of cost. Cortisone is not within the reach of the majority of people, and so a cheap indigenous compound which would give reasonably good results is certainly to be welcomed.

Cortisone and phenylbutazone, produce remissions only for short periods in diseases like rheumatoid arthritis while the remission produced by this Ayurvedic preparation sometimes lasted for six to seven months.

It is our considered opinion therefore, that this indigenous preparation is worthy of trial, not only in cases of chronic rheumatism but also in cases of osteo-arthritis particularly in rheumatoid arthritis. Further research is however, needed to assess its real value in the last mentioned condition.

Summary.—The results of a study on the use of an indigenous preparation in 70 cases of chronic rheumatism and arthritis, are presented.

The best results were noted in the acute phase of diseases like (a) acute severe fibrositis, (b) acute sciatica (of rheumatoid origin); and (c) possibly rheumatoid arthritis (acute and early phase). Its value in osteo-arthritis is uncertain, and can be assessed only by further trial. This drug acts slowly and progressively within 48 hours of administration though some cases have shown a dramatic and quick response. No toxic effects were noted. It gives a sense of general well-being. A fairly long period of remission is secured by its use.

Septic foci, when present must be removed to secure lasting results. Otherwise the disease is bound to recur. The mode of administration is easy, and it compares favourably with the numerous other remedies in use. It has also its limitations, for only in selected cases does it give gratifying results. Systematic and organized research in Indian medicine, will certainly reveal the existence of many potent herbal and other products which can profitably fill the lacunae in modern drug therapy.

References:

1. Holbrook, W. P. and Hill, D. F.—Manual of Rheumatic Diseases.
2. Am. Rheum. Assoc.:—Rheumatic Diseases.
3. Comroe, B. I.—Arthritis and Allied conditions.
4. Lowin, Philip—Backache and Sciatica.
5. Sharma, H.—Ayurvedic Medicines.
6. Lakshmipathi, A.—100 Useful Drugs.
7. Hariprapanaji Pandit—Rasa Yoga Sagar.
8. Mehta, P. M.—Charak Sambita (Transl.)
9. Kaikini, V. M., (1953)—*Antiseptic*, Jan.

SPECIFIC THERAPY IN RHEUMATOID ARTHRITIS

1. Corticotropin (ACTH) is indicated in rapid fulminating type of rheumatoid arthritis and contraindicated in chronic nephritis, congestive heart failure, Cushing's syndrome, diabetes mellitus, hirsutism, hypertension, peptic ulcer history, psychoses and psychopathic personality states, tuberculosis. It is useless in Addison's disease. It is used intravenously in aqueous solution or intramuscularly in gelatin. The therapeutic dose, aqueous, 10 mg. is given at six hour intervals. If no improvement the dose is increased. Maximum dose 25 to 30 units q 6 h. Interval may be increased if gelatin solution is used. Once improvement is obtained, the dose is tapered off to a maintenance level by reductions of five units per week. Intravenous route is the most effective if given slowly. Gelatin solution must not be used intravenously.

2. Cortisone is indicated in rheumatoid arthritis during acute stages and contraindicated in oedema, peptic ulcer history, renal or hepatic damage, hypertension, psychoses, tuberculosis, or other infectious disease. The saline suspension and tablet forms of the acetate are used; early high levels (200 to 500 mg. daily in divided doses) to obtain initial improvement. Once improvement is obtained the dose is tapered off over a period of 7 to 14 days to maintenance level. Alternative method is to start with low level of 100 mg. daily in divided doses and then to adjust the level either upward or downward to maintain approximately 75 per cent improvement. This method gives fewest side-effects. The routes used are the oral, intramuscular, or intravenous; the oral route being preferred.

The use of this drug involves continuous prolonged administration with possibility of cortisone addiction. Usually withdrawal symptoms are worse than original disease. Fatigue and muscular weakness with oedema during cortisone therapy can usually be controlled by reduction of sodium intake and addition of 3 g of potassium salt daily. This drug is beneficial in arthritis where other methods fail. Occasionally a sustained remission is obtained. Magnitude of side effects is directly related to size of dose. A carefully controlled study finds no apparent difference between long term cortisone and aspirin therapy.

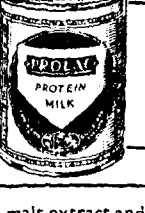
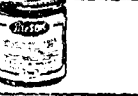
3. Hydrocortisone (Oral) is indicated in rheumatoid arthritis that will not respond to other forms of therapy. The contraindications are the same as for cortisone. The tablet form of the alcohol is more effective than the acetate, and in severe cases, 60 to 70 mg. is used daily in divided doses; in moderately severe cases, 40 to 50 mg. These amounts are continued until clinical manifestations of arthritis are suppressed, ordinarily, one to three weeks. Once clinical improvement is obtained, the dosage should be reduced stepwise by 5 mg. every 7 to 14 days until a maintenance dose is reached giving 75 to 85 per cent relief of pre-treatment symptoms. This level varies from 40 to 70 mg. daily. Some recommend a rest period of 2 to 3 months for every 18 to 24 months of continuous therapy. Oral hydrocortisone has the advantage that it is 27 to 50 per cent more effective than cortisone. Thus 50 mg. hydrocortisone has about the same anti-arthritic effect as 75 mg. cortisone, hence side effects are lessened.

4. Hydrocortisone (Intra-articular) is used to obtain relief in a single large joint as in the knee, elbow, wrist, ankle and to aid in orthopaedic correction. The suspension of hydrocortisone (alcohol) is used in the larger joints 25-50 mg. and in smaller joints as in the fingers 5-10 mg. intra-articularly. Repeated injections are needed to maintain relief. The results are only temporary. Side effects are lowered. Hydrocortisone disappears from the synovial cavity in a few hours, where the dose of hydrocortisone is 35 mg. or more per joint; effects produced are due to systemic reaction rather than to any local activity of the compound.

5. Phenylbutazone is indicated in almost all forms of rheumatoid arthritis. Trial with this compound is indicated before resorting to cortisone or ACTH. It is contraindicated in oedema, with possible cardiac decompensation, peptic ulcer history, history of blood dyscrasias, renal or hepatic damage, hypertension. The tablet form is used orally from 600 to 800 mg. daily in divided doses. More than 800 mg. per day produces no better results but increase toxicity. In 2 to 3 days the dose is lowered to 400 mg. per day. Maintenance level varies from 200 to 400 mg. per day. The drug is best tolerated when taken before or after meals with a full glass of milk. Sodium salts in the diet should be avoided. Verbal and physical examinations should be done weekly for toxic effects. Weight should be checked to detect water retention. Warn the patient to report immediately the occurrence of fever, sore throat, lesions in mouth, black tarry stools. Do complete blood counts including platelets at start of therapy, and then at weekly intervals until maintenance level is established. Stop the drug at first signs of anaemia or agranulocytosis. Relief is obtained rapidly if the patient can tolerate it. Its high toxicity requires constant supervision.

6. Gold salts are indicated in progressive activity of rheumatoid process despite adherence to a conservative programme and are contra-indicated in process diabetes mellitus, nephritis, ulcerative colitis, pregnancy, specific allergy, hepatic disease, blood dyscrasias. The preparations used are gold thioglucose, 50 per cent gold; gold sodium thiomalate, 50 per cent gold; aurothioglycanide, 54 per cent gold. The dosage is intramuscular at 5-7 days intervals. First dose 15 mg., second dose 25 mg., third dose 50 mg., continuing at 50 mg. level until total dose of 800 to 1000 mg., has been given. Continue 50 mg. at three to four week intervals until total dose reaches 1500 to 2000 mg.

Precautions:—Before therapy determine satisfactory kidney and liver function, do weekly urine analysis (complete with microscopic), haemoglobin and white blood count. Question patient for signs of pruritus, sore mouth or rash. Each month do complete physical examination and blood study. Observe for signs of exfoliative dermatitis, stomatitis, hepatitis, gastritis, albuminuria, haematuria, agranulocytosis, thrombocytopenia or aplastic anaemia. If untoward effects noted, stop gold. For definite toxicity use ACTH, BAL and antibiotics. Toxic reactions may persist for a year or more.—(N.W. Medicine, 54: 11, February 1955).

Some Cow & Gate Products		
COW & GATE MILK FOOD		A complete food for normal infants. Specially prepared for hot climates and fortified with Vitamin D and iron salts.
For babies from birth to three months old where reduced fat considered desirable. Also for fat intolerance. Fortified with Vitamin D and iron salts.		HALF CREAM MILK FOOD
BEURLAC		A standardised buttermilk in powder form with 3% lactic acid for gastro-intestinal disturbances, marasmus, etc. Also useful for prematures.
A complete food for babies allergic to the lactalbumen of normal milk.		ALLERGILAC
DEXTRIN MALTOSE C.G. (Daltose)		A carbohydrate mixture for milk modification. Useful where increase of weight desired whilst avoiding fermentation and diarrhoea often caused by single sugar.
A milk food for the prevention and treatment of nutritional anaemia in infancy.		HEMOLAC
PROLAC		A high protein milk food with added lactic acid for use in cases of gastro-enteritis, diarrhoea and vomiting.
A blend of specially chosen fats with malt extract and concentrated orange juice for milk modification for underweight babies, loss of weight and malnutrition		BRESTOL
COW & GATE LTD., Guildford, England. Local Agents: CARR & CO., LTD. Bombay, Calcutta & Madras.		

Cosome

For the economical treatment of coughs of all kinds in

Common colds
Bronchitis
Influenza
good results in
Whooping cough

Bottle of approx. 170 g.

E. Merck

DARMSTADT - GERMANY

Sole Agents in India:
Capco Limited - E. Merck Dept.
P.O. Box 1632 - Fort, Bombay 1

SURGERY IN MOFUSSIL AREAS*

Capt. R. S. KESAVA RAJ, M.B., B.S.,
District Medical Officer, Mangalore, South Kanara

UNLIKE medical practice, surgical practice is expensive, time-consuming and requires the collection and use of suitable equipment. Time was when surgery was performed mainly in big towns and head-quarters' hospitals, and when only a few men handled the knife and the mortality rate was somewhat high. Thanks to new discoveries, improved anaesthetic techniques, the sulpha drugs, antibiotics, blood and plasma transfusions, saline transfusions, efficient management of post-operative complications, and good nursing, surgery is now being practised by many and with great success.

Preliminary investigations are now possible with modern diagnostic aids like X-rays, biochemical examinations of body fluids, biopsies, cystoscopy, pyelography etc., even in distant mofussil areas, and a correct diagnosis is usually arrived at in many cases before surgery is undertaken.

The operating surgeon should be quick, firm and resourceful, and be able to deal promptly with any emergencies arising in the course of the operation, some of which may be altogether unexpected. He should be thoroughly familiar with the anatomy of the part to be operated, with the diagnosis of the actual condition he has to deal with, and with the several procedures in technique, including emergency needs. Blood-loss should be combated without delay, by early replacement of fluids so as to prevent shock.

The extent of blood-loss occurring during major operations was worked out by Crook, Lob and Collier in 1946 and the statement overleaf based on their findings with slight modifications, will no doubt be of practical interest and help.

As already stated, the good surgeon should forestall all possible contingencies and prepare himself, even before starting the operation, to meet them. The essential qualities, required of a good surgeon according to Moynihan are:—gifts of character, leadership, wisdom even worldly wisdom, compassion and the finest technical skill. In respect of the latter we must remember that surgery is not only a science, but an art—work demanding the highest craftsmanship and a knowledge of all "the tricks of the tools' true play."

A capable anaesthetist is indeed an asset. Recent advances in surgery and many of the marvellous modern surgical operations like the shunt operation for the Tetralogy of Fallot, the widening of the mitral stenosed valvular opening, lobectomy, operations on

* Specially contributed to the Golden Jubilee issue of the ANTISEPTIC

the central nervous system have been possible because of the expert assistance given by highly experienced anaesthetists who look after the anaesthetization as also the general condition of the patient and always keep an eye on the blood-pressure and the fluid balance.

TABLE I* (After Crook, Job, and Coller-1946).

OPERATION	Range of blood-loss in cc.	Average blood-loss in cc.	Average decrease per cent. in total blood volume	Operating time in minutes
Biliary tract operation	150-1,455	594	14.6	105-255
Radical breast amputations	520-1,091	808	17.4	143-249
Stomach operations.	321- 480	599	6.8 to 20.0	155-287
Resection of rectum	183- 686	410	9.5	107-245
Thyroidectomy	204- 725	373	10.7	58-140

* (Modified from statement on p. 417, *Surg. Gynecol. Obst.*, 82: 1946).

NOTE:—"Insensible evaporation and sweating are both greater than normal and may be responsible for the loss of from 1 to 3 litres of fluid during the course of a long operation."

TABLE II

MEDICAL INSTITUTIONS	SURGICAL OPERATIONS THAT CAN BE DONE
Rural Dispensaries.	Amputations of digits; piles and fistula; inflamed hydroceles; removal of small tumours; abscesses; scraping of wounds.
Fairly well equipped Taluk Headquarters Hospitals.	Hydrocele; hernia; elephantoid scrotum; strangulated hernia; abdominal emergencies. Appendicectomy; gastrojejunostomy; skin grafting.
District Headquarters Hospitals.	Gastrectomy; tumours of the abdomen; pelvic tumours peculiar to women; radical mastectomy; Resection of bowel, etc. and nephrectomy.

Marvellous surgery was performed during the Second World War, under the most trying and difficult conditions obtaining on the fields of battle—black-outs, absence of proper equipment, paucity in the dressings, steriliser facilities, adequate lighting etc. Success was due to the antibiotics, blood and plasma transfusions and to the pluck and resourcefulness of the surgeons. There is no reason therefore, why good surgery should not be possible in the rural areas of our country. Given the barest equipment necessary, a willing band of workers imbued with the zeal and willingness to face and

overcome difficulties, mofussil stations (rural and semi-urban) can hope to be served well in the matter of their surgical needs.

In Table II on the previous page will be found, what I consider should be possible by way of surgical operations in Rural Dispensaries, Taluk and District Hospitals respectively.

Apart from the cost of building, (or rental) and the salaries of the staff, the equipment required for a decent surgery will cost about Rs. 5,000. The essential items are:—a high-pressure sterilizer (autoclave), a shadowless lamp, Boyle's apparatus for anaesthesia suitable bedsteads and good sharp instruments. The rural medical practitioner has to work under conditions far from pleasant or ideal if the people give their active help and cooperation, and realise that they cannot have everything free, considerably better results can be achieved in rural medical and surgical relief.

SPINAL ANÆSTHESIA FOR HÆMORRHOIDECTOMY

Herbert T. Hayes, M.D., and Harry D. Burr, M.D., Houston, report that the lasting effect of tetracaine (Pontocaine) with epinephrine as a spinal anaesthetic agent helps to reduce pain after anorectal surgery; the incidence of post spinal headache is reduced.

Pontocaine, 5 mg., with 1 mm. of epinephrine is injected through a 22 gauge needle between L4 and L5. With the patient on the side, the drug is expanded to 1 cc. in spinal fluid and injected slowly. The patient is then turned on the back and the feet are immediately placed in stirrups. Anaesthesia begins in two or three minutes and continues four to six hours or more. Perianal injection of 5 or 6 cc. of 40% ethyl alcohol just before operation also helps to control post-operative discomfort. The alcohol is injected subcutaneously and the side massaged vigorously. The alcohol should not be injected into or puddled under the skin.—(*South M. J.*, 47: 577-582, 1954, via *Mod. Med.*, 15-9-1954).

SURGICAL PRINCIPLES IN ANORECTAL DISEASE

Good results in anorectal surgery, according to Gerendasy, depend on the drainage factor, factors of operative technique, the physiology of wound-repair, and the principles of wound management.

Adequate drainage is important to prevent hæmatoma formation and to insure freedom from infection. Operative technical factors are (1) careful handling of tissues, (2) avoidance of mass ligatures, and (3) elimination of large or prolonged gauze-packings, as they interfere with drainage and tend to produce wound infection. The use of sharp dissection is least damaging to living tissues and provides for optimal wound healing. All diseased tissues should be excised to insure a healthy wound and to prevent delayed healing, complete hæmostasis is necessary.

The minimum number of sutures and ligatures should be used. External wound drainage can be maintained by the use of hot applications. Finger dilatation or massage of the anal canal should be begun on the fourth or fifth day post operatively. Drainage material such as gauze, soft rubber tubing are not employed routinely, although gauze packing into the wound proper is sometimes used to prevent bleeding. Over-treatment should be avoided, and careful regulation of bowel habits by dietary means is the best method of keeping the anal canal patent and functioning normally.—(*Am. J. Sur.*, 87: 195, 1954, via *G.P.*, June 1954).

THE PRINCIPLES OF PRE-OPERATIVE AND POST-OPERATIVE CARE

Of greatest import in the pre-operative and post-operative care of the surgical patient is the distinction between the reversible and irreversible conditions. The irreversible lesions must be accepted; they will influence the surgery indicated in a negative sense, that is, they suggest the avoidance of any form of surgery when possible, and reduce the indications for unavoidable surgery to the barest minimum. The surgeon should, of course, not hesitate to consult his colleagues in other specialities.

Paramount in the reversible lesions are the various deficiencies. The surgeon must carefully consider all deficiencies, such as of vitamins, blood (hæmorrhage) hæmoglobin, in particular, and fluids in general. They have always been a problem with reference to the surgical patient. Recently, however, a multitude of deficiencies, such as blood plasma losses and electrolytic imbalance have been observed.

Many of the post-operative comas, which were previously written off as hepatic or other types of coma are today recognized as an effect of electrolytic imbalance. Even the well known and much dreaded entity of surgical shock is now known to be largely the result of various reversible pre-operative states of the patient. In the state of shock which is considered to be the result of acute blood loss, massive blood transfusions were in order. Today, however, it is recognized that the condition of shock may be the result of a lack of certain elements of the blood, such as of plasma or fluid, and the proper procedure may be the administration of the particular deficient element instead of whole blood. In fact, the infusion of sufficient whole blood to make up this particular deficit might overburden the circulatory system with fluids and cellular elements (polycythæmia) hæmorrhage might indeed be better handled by immediate intra-arterial transfusion than by massive perfusions into the venous side of the cardiovascular system.

In the administration of the lacking factor to the patient's economy a certain selectivity seems indicated. The correction of fluid losses from the body with simple physiologic saline or Ringer's solution, or the provision of sugar solutions in instances in which electrolytic imbalance is not thought to be present can hardly be justified today. Each individual type of fluid loss presents a different electrolytic picture and demands perfusion fluids of carefully calculated mixtures based on ion-equivalent considerations.

For the simple loss of fluids from sweating, a simple mixture of glucose (5%) and sodium chloride (5%), or Ringer's solution in equal parts is sufficient. In the losses incident to vomiting or gastric aspiration, however, this mixture is supplemented by ammonium chloride solution (0.75%) to increase the chloride buffer without increasing the sodium content. When increased calorie requirements must be met, the sugar used may be sodium lactate rather than simple glucose, since it is more easily perfused in large quantities and gives a higher calorie intake. Ampoules of 5 per cent glucose, 0.9 per cent sodium chloride, 0.9 per cent Ringer's solution, one sixth molar sodium lactate solution, and 0.75 per cent ammonium chloride solution are to be kept ready for mixing with distilled water or physiologic saline solution.

In the presence of extraordinary electrolytic and water losses, the patient receives parenteral fluids in addition to the normal requirements of the healthy person (200 c.cm. 5 to 10% glucose), the indicated infusion fluids corresponding quantitatively to the electrolytic status of the patient and qualitatively to the losses sustained.—(Abst. by Brennan, in *Intern. Abst. Surg. from Geburtsh. and Frauenh.*, 14: 97).

SOME OBSERVATIONS ON ANAEMIAS AND THEIR TREATMENT*

JAYANT M. BHATT, M.B., B.S.,
Asst. Surgeon, Irwin Hospital, Jamnagar

THIS review is based on the results of a clinical study of disorders of the blood—usually styled anæmia, which is a pathological condition associated with alterations in the quantity and quality of the circulating blood. We have treated several types of blood dyscrasias, resulting from many different causes.

I. Haemorrhagic.—This type of anæmia is the result of the loss of blood through multiple leakages from the human body *e.g.*, bleeding piles, severe and prolonged epistaxis in a patient with hypertension, post-partum hæmorrhage after confinement, or severe hæmatemesis due to cancer of the stomach.

II. Haemolytic.—In this type of anæmia, the actual pathology lies in the breaking down and disintegration of RBCs resulting from different causes such as infections, poisons, malaria, kala-azar, syphilis, lead poisoning, jaundice and occupational hazards.

III. Dyshaematopoietic.—Caused by deficiencies and disorders which may be dietetic; alimentary; vitamin or/and endocrinal, in origin.

The vast majority of cases of anæmia belong to this group. The normal erythropoiesis gets disturbed as evidenced by an examination of bone marrow obtained from a sternal puncture. The maturation of the hæmopoietic cells undergoes a change, and the cells increase in size and number. The process of hæmoglobinization is delayed and the nuclei do not disappear.

Microscopic examination of a peripheral blood smear reveals the alteration in the number of cells and the reduction of hæmoglobin in the average red cell. Based on the nature of the changes we differentiate anæmias into:—macrocytic hyperchromic, and microcytic hypochromic.

The dyshaematopoietic type of anæmias are associated with disordered nutrition. Tropical megaloblastic and iron deficiency anæmias are included in this class.

The type of marrow-reaction depends on the cause *e.g.*, in the hæmorrhagic type of anæmia due to bleeding piles etc., there is hyperplasia of the marrow, due to the increased demand for fresh red blood corpuscles. In the pernicious type of anæmia which is due to a deficiency in the formation and storage of the anti-anæmia principle, there is a megaloblastic type of erythropoiesis.

Very often in the hæmolytic type of anæmias along with the normoblastic erythropoiesis, leucoblastic response is seen due to invasion of the bone-marrow by some infective agent. The hyper-

*Specially contributed to the ANTISEPTIC.

plasia of red marrow occurring in this type is clinically manifested by tenderness on tapping over the shin of the bones.

In dealing with any blood disorder, the treating physician should have a complete blood-picture before he can arrive at a correct diagnosis and plan the line of treatment for combating the chain of symptoms observed clinically.

TREATMENT:—Iron therapy in anaemia.—Iron is essential for combating the pallor in anaemia and also for stabilizing the action of hæmatinic drugs. It is essential for the synthesis of hæmoglobin; and helps in the maturation of red blood corpuscles. It serves also as an index to determine the number of RBCs delivered from the bone marrow into the general circulation. Oral administration of iron has not been efficient or successful in many cases as its action depends solely upon its adequate absorption and utilization by the system for the regeneration of hæmoglobin. Iron administered orally has also often been found to irritate the digestive tract and cause digestive disturbances, and so it is not favoured.

Intravenous iron therapy using a saccharated oxide of iron is now largely in vogue and has been found to be efficient in combating the microcytic hypochromic, and the hæmorrhagic types of anaemias. Satisfactory response is manifest in suitable selected cases between the 6th and 11th days after starting treatment.

Intravenous iron therapy however, requires considerable care and attention to details of dosage, timing and side-effects. Some have reported toxic reactions following such therapy, which include severe dyspnoea, rigors, collapse, sudden fall in B. P., diarrhoea and abdominal pain. We have however, not had any such experience in the cases treated by us.

Role of vitamin B₁₂.—B₁₂ is known as the erythropoietic factor of liver. As a result of treatment with Vitamin B₁₂, the nervous disorder known as subacute combined degeneration of the cord is now very rare in patients with pernicious anaemia. B₁₂ is believed to exert a steadying influence in the matter of nourishment and in the functioning of nerve cells in health and disease. Vitamin B₁₂ is well-known for its anti-anæmic effect and growth promoting property, and plays an important part in the utilisation of the dietary protein.

Folic acid stimulates the bone marrow and helps in the regeneration and maturation of RBCs. It supplies nutrition to the mucous cells of the digestive system, as evidenced by its effect in some cases of sprue treated in our medical wards.

The synergistic action of folic acid and B₁₂ should always be kept in mind, while dealing with cases of anaemia.

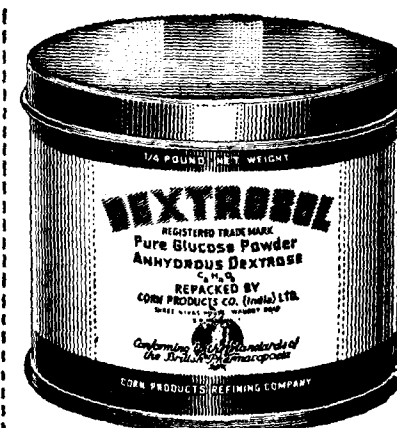
My grateful thanks are due to Dr. Suresh H. Baxi, M. D., Honorary Physician and to Dr. Surendra S. Bakshi, M. S., Chief Medical Officer of the Irwin Hospital, Jamnagar for their helpful guidance and for the facilities afforded to me.

Choose the right Glucose Powder for your patient's needs

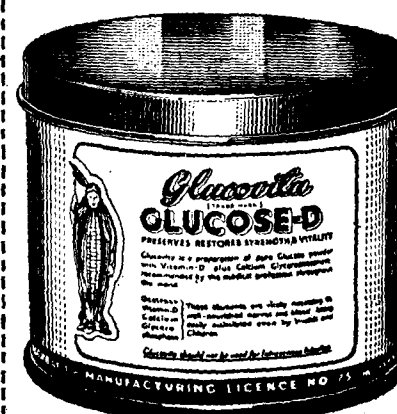
If your patient needs Glucose, you may feel that he will get *full* benefit from a prescription of pure Glucose only. Or you may think that *Glucose plus Vitamins* is best for him.

In either case, there is a preparation for you made by Corn Products Company—the people who have been manufacturing Glucose powders longer than anyone else.

DEXTROSOL and GLUCOVITA are Glucose preparations that have been tried and proven by doctors the world over.



DEXTROSOL, 99.8 per cent pure, is Glucose in the purest form available anywhere. It is anhydrous—it does not even contain water of crystallisation.



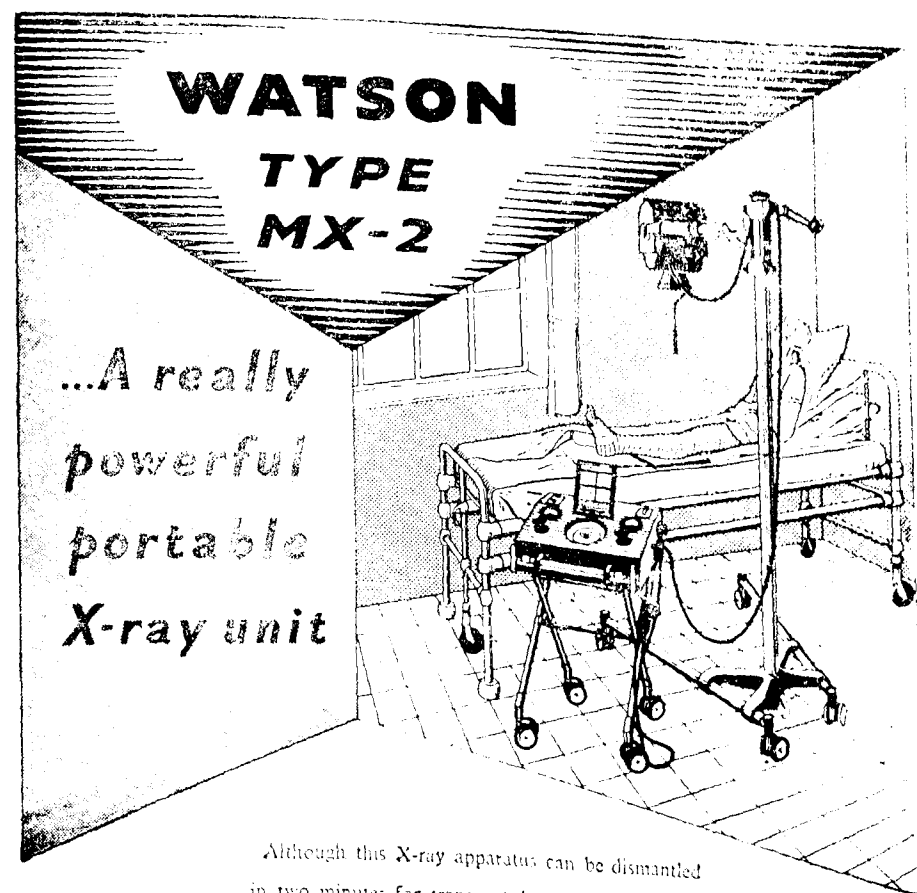
It is not enough to prescribe 'Glucose-D'. Prescribe GLUCOVITA—Corn Products Company's brand name for Glucose with Vitamin D and Calcium Glycerophosphate.

CORN PRODUCTS COMPANY (INDIA) LIMITED

BOMBAY 1 — CALCUTTA 1

Every tin of genuine DEXTROSOL and GLUCOVITA bears this COPROCO symbol





Although this X-ray apparatus can be dismantled in two minutes for transport by car, it has a high X-ray output. It is often solely used in a small radiological practice. Radiographs of excellent quality can be taken of all regions of the body.

Type MX-2 is extremely robust and will give long service without attention under the most severe climatic conditions.

We will gladly arrange a practical demonstration without obligation. Please write for further information.

G.E.C.
 THE GENERAL ELECTRIC COMPANY OF INDIA LIMITED
 Magnet House, Chittaranjan Avenue, Calcutta-13
 Branches at:
 Bombay Madras Kanpur Delhi Bangalore Coimbatore Secunderabad.
 (Representing THE GENERAL ELECTRIC CO. LTD. OF ENGLAND)
 Also represented in: Karachi Lahore Chittagong Rangoon.

GEC 1953

Cases and Comments

CEREBRAL MALARIA ASSOCIATED WITH ATYPICAL CLINICAL FEATURES WITH AUTOPSY FINDINGS

D. BHASKARA REDDY, M.D.,

Lecturer in Forensic Medicine, Andhra Medical College, Visakhapatnam

INFECTION of the human being with *plasmodium falciparum* malarial parasite is manifested in different ways. It is known by various terms such as pernicious or cerebral malaria. It is usually applied to a series of phenomena occurring during the course of an infection with the parasite which, if not effectively treated, threatens the life of the patient within a short time. This syndrome which commonly develops as a result of blockage of the capillaries by parasitised red blood cells depends entirely on the organs affected by the pathological process. These pernicious manifestations may develop during a course of attack or may appear from the start with such dramatic suddenness as to cause death within a very short time. The various manifestations of pernicious malaria may be grouped as follows: (a) cerebral, (b) septicæmic and (c) algid type. The relative incidence of these different types noted in Seyfarth's autopsy records (1926) is as follows:—cerebral 55 per cent, algid 14 per cent, septicæmic 30 per cent and renal 1 per cent. Combinations of these types may be met with but they are somewhat rare. The following is an unusual case report of cerebral malaria in combination with a septicæmic type presenting jaundice. The detailed autopsy report is also furnished below.

Case Report.—A Hindu male, R. A., aged 40 years was admitted in the medical wards of King George Hospital on 25-3-54 for pain in the right hypochondrium and fever since 3 days. The present complaint started 3 days previously with pain in the right hypochondrium, fever and vomiting which was bile-stained. General examination revealed the patient to be drowsy and there was yellowish colouration of the conjunctiva.

The heart sounds were feeble; liver and spleen were just palpable and tender.

Examination of the central nervous system revealed the pupils dilated and not reacting to light.

Laboratory investigations:—Hb. 60%. R.B.C. 3.9 mill/cmm. W.B.C. 10,500/cmm. Differential count:—Polymorphs 72. Eosinophiles 3%. Lymphocytes 25%. Blood-pressure 90/50. Lumbar puncture done under pressure; Proteins 60 mg. Globulin + Sugar 50 mg. per cent Chloride 720 mg. per cent.

Lange's colloidal gold curve—3,211,100,000

Clinical diagnosis: Infective hepatitis.

[463]

The patient died on 27-3-'54 after 48 hours' stay in the hospital.

Post-mortem appearances:—An autopsy was performed 72 hours after death. Smears were taken from the peripheral blood, spleen, liver and bone-marrow every 24 hours from the time of death and stained with Leishman's stain. Parasites were demonstrated even up to 72 hours after death when the autopsy was performed.

Autopsy findings:—Fairly well nourished individual of about 40 years. Icteric tinge of the conjunctiva noticed. No cyanosis or clubbing of fingers noted. On opening the abdomen no free fluid could be seen. Liver and spleen were enlarged and other organs were in normal position.

Tonsils; Trachea; Thyroid: nil remarkable.

Each lung weighed 390 g. Crepitant throughout showed only basal congestion in both lungs. No evidence of consolidation.

The liver weighed 1200 g. Uniformly smooth, firm and cut section was dark black in colour. Histological sections studied from various portions of the liver showed the capsule to be thickened. The sinusoids were markedly dilated and the Kupffer cells lining the sinusoids were loaded heavily with malarial pigment (*Fig. 1*). Almost all the Kupffer cells seemed to be filled with pigment. There was mild mesenchymal reaction around the portal tract with round cell collections (*Fig. 2*) but no definite evidence of cirrhotic changes. There was no evidence of necrosis of liver cells.

The spleen weighed 420 g.; markedly enlarged, smooth and firm, dark in colour, cut with resistance and cut surface appeared as homogeneous black scattered with fibrous bands and greyish white spots. Microscopic examination of the spleen revealed the capsule to be thickened. There was congestion and distention of venous sinuses with blood. Abundance of hemozoin pigment occurring as granules or masses inside the macrophages were seen (*Fig. 3*). Malpighian corpuscles were scattered irregularly and were free from hemozoin pigment.

The brain weighed 1380 g. Cortical vessels were markedly congested and the brain was slate grey in colour. White matter showed multiple punctiform hemorrhages - cut surface of the brain was wiped with the edge of a clean knife and a smear made on the slide (impression-smear) casts of pial blood vessels with parasitised red blood cells were demonstrated in stained preparation.

Histological study from the various sites of the brain revealed dilated, congested capillaries and arterioles of the brain; all of them were filled with parasitised erythrocytes (*Fig. 4*). Perivascular hemorrhages were generally found in relation to the arterioles. Malarial pigment could be seen filling and blocking most of the capillaries. Nerve cells showed varying degrees of degeneration. The so-called malarial granulomas could not be found on detailed histological study.

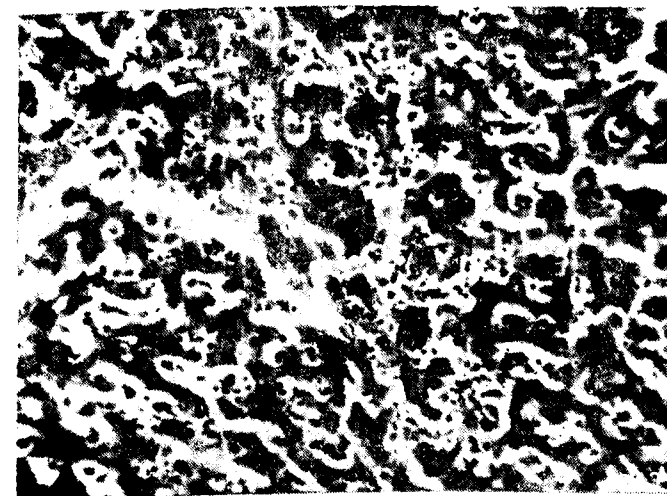


Fig. 1. Photomicrograph shows the Kupffer cells lining the liver sinusoids distended with hemozoin pigment (H & E $\times 100$).

[See p. 464]

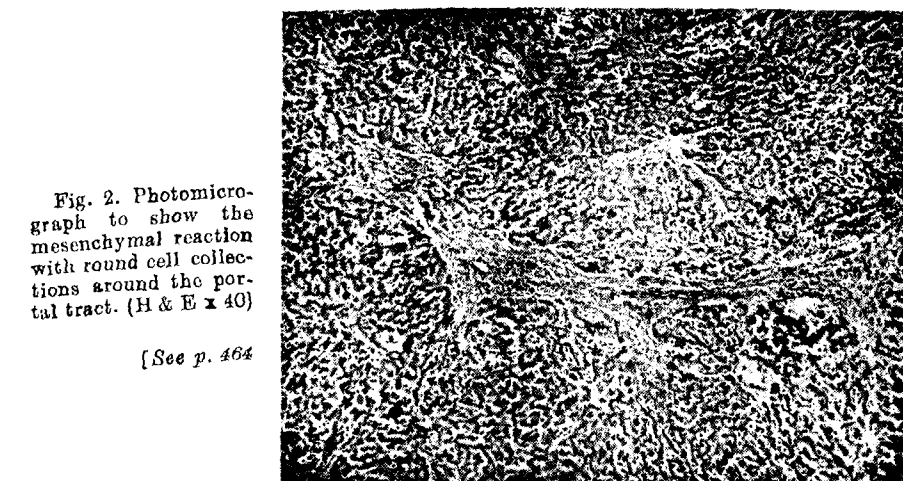


Fig. 2. Photomicrograph to show the mesenchymal reaction with round cell collections around the portal tract. (H & E $\times 40$)

[See p. 464]



Fig. 3. Photomicrograph showing the thickened capsule with hemozoin pigment in splenic pulp. (H & E $\times 60$).

[See p. 464]



Fig. 4. Photomicrograph shows the cerebral capillaries filled with parasitised RBC's and haemozoin pigment. (H & E x 60).

[See p. 464]

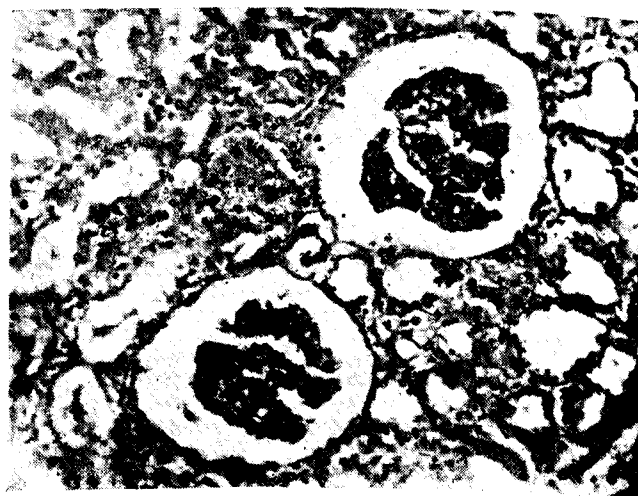


Fig. 5. Photomicrograph shows the haemozoin pigment in the glomeruli of the kidney. (H & E x 60).

[See p. 467]

The heart weighed 270 g. All the chambers were filled with fluid blood and the valves did not reveal any abnormality. Aorta showed atheromatous changes. Microscopical examination of the heart revealed extreme congestion and the pigment was found in the blood vessels. There was thickening of the coronary blood vessels.

The kidneys: each weighed 150 g. Slightly enlarged capsule stripped off easily. Cortex was pale grey and congested pyramids of medulla.

Microscopical examination of the kidneys revealed haemozoin pigment in the glomerular tuft (Fig. 5) and intertubular blood vessel. The inter-tubular blood vessels were congested. The tubules themselves showed degenerative changes. All the other organs showed no abnormality.

AUTOPSY DIAGNOSIS:—Pernicious malaria with atypical clinical features.

Comment.—The predominant symptoms of jaundice, pain in the right hypochondrium and tender enlarged liver in this case made the clinician think of this condition as one of infective hepatitis. Unless the clinician or the general practitioner is aware of such a state in infections with *plasmodium falciparum* he is likely to miss such cases which usually end fatally. In all these cases a blood smear will clinch the diagnosis. These types of cases are usually met with in the septicæmic bilious remittent type of *falciparum* malarial infection. In the case under review both cerebral and septicæmic types were combined which produced the symptoms recorded. If diagnosed early and treated properly such cases might be saved. Jaundice in the case reported may probably have been due to a hæmolytic phenomenon which is usually observed in malarial infections.

It was possible to demonstrate the parasites in the various tissues described, till 72 hours after death when an autopsy was done and this clearly proves that malarial parasites are not readily destroyed soon after death and that they can be demonstrated for some time after death.

Summary.—1. A case report including necropsy findings in a case of cerebral malaria associated with atypical clinical features is presented.

2. In all obscure cases of fever, jaundice, hepatomegaly and splenomegaly in our country it is important to remember cerebral malaria as a distinct possibility.

Acknowledgements.—I am extremely thankful to Dr. D. Govinda Reddy, M.D., for all his help and to Dr. G.V.S. Murthy, M.D., for the case notes. With pleasure, I acknowledge the help rendered by Photo artist Edwin.

References:

1. Chatterjee, K. D., (1952)—Human Parasites and Parasitic Disease.
2. Seyfarth, C., (1926)—Die Malaria Handb Spez. Path. Anat. Histol., 178-248.

SULPHONE FOR LOCAL THERAPY IN OPHTHALMIC PRACTICE*

GOPAL CHANDRA SEN, M.B., D.O.M.S.,
Islamia Hospital, Calcutta

SULPHONES, which have been found efficient in leprosy, have since been tested both *in vivo* and *in vitro*, as well as clinically, for their bactericidal properties, against a variety of pathogenic organisms like tubercle bacillus, strepto and staphylococci, B-coli, diplococci etc.

The results of the extensive laboratory work done by Acklin, Rossi and others show that the sulphones have significant bactericidal effect *in vitro* on various pathogenic cocci. In view of this finding Rossi further tried sulphones in the local treatment of 152 cases of otitis, both acute and chronic. The clinical and bacteriological findings are summarised by him as follows:

"A report is given of 152 cases of acute, sub-acute and chronic, perforated cases of otitis with discharge, some of which were treated with Ciloprime alone and some with Ciloprime + S-amides; 78.3% of the cases were healed, this result being favourable in consideration of the fact that most of the cases were of an obdurate nature and that part of them had been previously treated without success. No secondary reactions were observed save for one case of slight stratification of the tympanic membrane."

The favourable bactericidal properties of sulphones have made their application successful in local therapy (*vide* Alfred Burger's "Medicinal Chemistry," Vol. II, pp. 831-834). Our trials* were conducted at the Islamia Hospital, Calcutta, both on indoor as well as outdoor patients. The obvious difficulty of a proper follow-up of out-door patients limited the number of case-reports. The difficulties in carrying out detailed pathological examinations on the cases before, during and after the treatment have been responsible for the non-inclusion of the same in the present article which is meant to be a preliminary report on the salient features of the new therapy and its clinical evaluation in various features of the affections. However, a detailed communication containing the regular pathological findings will be made later.

The cases selected amongst the out-door patients were, acute and chronic conjunctivitis, phlyctenular conjunctivitis and trachoma. The treatment of the patients was ambulatory, and the patients were asked to report regularly at the hospital in order to record the progress. In the case of in-door patients the treatment was mostly carried out in post-operative cases as a prophylactic.

* The preparation used was the Morpholine salt of Diamino-diphenylsulphone-N-acetate 5% aqueous solution kindly supplied for clinical trial by M/s. Cilag Hind Ltd.

In both instances, a comparison of the sulphone-treated cases was controlled against a batch of patients treated with sulphacetamide eye drops; the therapeutic efficacy of each and the side-reactions, if any were noted. In operated cases, the clinical condition of the patients with particular reference to discharge was studied in each of the groups, *viz.*, (1) those treated with sulphone, (2) those treated with sulphacetamide, and (3) the control batch without any local medication.

A comparative study of the effect of penicillin drops, antibiotic drops and protargol-drops as compared to the effects of the drug under review was also undertaken by me in the hospital.

The results of the clinical observations in each case are shown below:—

I. Acute conjunctivitis.—

TABLE I

Drug used	Dose	Total No. of cases treated	Discharge	Clinically normal	Side-effects
1. Sulphone	One drop four times a day in conjunctival sac.	26	Absent from the 5th day.	5th day	Soothing effect. No burning.
2. Sulphacetamide	do	26	Present even on the 6th day.	Improvement on the 7th day.	Burning sensation reported.

II. Chronic conjunctivitis.—

1. Sulphone	One drop four times a day in conjunctival sac.	4	Absent on the 5th day	5th day	No burning
2. Sulphacetamide	do	4	Continued	No response	Burning

The most striking point of interest was that in chronic conjunctivitis the local application of the drug produced prompt satisfactory results while all other treatments failed.

III. Phlyctenular conjunctivitis.—Only two cases were treated and with the same dosage of the drug, redness and discharge were absent on the 5th day, while sulphacetamide failed to produce any response.

IV. Trachoma.—

TABLE II

Drug used	Dose	Effect
1. Sulphone	One drop every 3 hours	Conjunctival conditions improved in 7 days
2. Sulphacetamide	do	No response

V. Post-operative cases —

TABLE III

Drug used	Dose	No. of cases	Discharge	Condition of the conjunctiva
1. Sulphone	One drop 3 times a day from next day of opening the bandage	14	Absent on the next day.	Better after 5th day.
2. Sulphacetamide.	do	14	Present +	Improvement after the 7th day
3. No drug			+++	

The remarkable absence of discharge in cases treated with sulphone drops, facilitates the early healing of the surgical wounds. Local therapy with sulphone eye-drops has distinct advantages over the sulphacetamide therapy as will be seen from the above tables. Besides giving quicker results, it is absolutely free from any side-reactions like itching or burning, and it is of help even in chronic cases. It has not been possible for me to assess the value of the drug in cases of infections of the lacrimal apparatus, and in ulcers of the cornea. It may perhaps do equally well in those conditions also.

We do not know yet, if the drug may by infiltrating into the eye, be found useful in inner infections of the eye, and also in tubercular and lepromatous lesions of the eye. These points are worth investigating.

Summary.—Fifty cases, including acute and chronic conjunctivitis, Phlyctenular conjunctivitis, trachoma and post operative cases, treated with eye drops containing a Morpholine salt of Diamino diphenylsulphone-N-acetate, have been studied. Controls for the same in each group were treated with sulphacetamide eye-drops. From the clinical observations made the sulphone eye drops were found to give quicker and better results and the most striking fact was that there were no side-effects like itching or burning sensation. It was also found to be very useful in post-operative treatment of eye conditions.

My thanks are due to the Superintendent, Islamia Hospital for according permission to publish this article.

References

1. Burger, Alfred—Medicinal Chemistry, Vol II, pp. 831-834.
2. Acklin, O.—New Bactericidal Sulphonates.
3. Rossi, E.—The Sulphones in Treatment of Otitis Purulenta Perforata in Children.
4. Glaninger, J. and Neuhold, R.—Sulphone for local treatment of Inflammations of the Middle Ear.

DEXTRAN AS A PLASMA SUBSTITUTE: EXCRETION STUDIES ON CONTROL PATIENTS

A series of 30 control patients with normal blood volume were given intravenous infusions of 1,000 cc. of 6 per cent dextran in 0.9 per cent saline solution. The average plasma volume increase was 823 cc., and the average blood volume increase was 909 cc. in 6 hours after the infusion was completed.

On an average, 20.5 per cent of the dextran was excreted in the urine within 6 hours, and 30.6 per cent was excreted in 24 hours. Adverse reactions were observed in only one patient who developed generalized urticaria and dyspnoea with wheezes 30 minutes after the beginning of the infusion. He improved rapidly under adrenalin, chlor-trimeton, and aminophylline therapy.

Harrison considers that dextran is an effective and generally safe plasma volume-expander. Its resuscitative value is enhanced by the fact that it can be made available to patients in shock immediately upon their arrival in emergency clinics, or even at the scene of the accident. —(Ann. Surg., 139: 137, 1954, via Internat. Abst. Surg., 99: 5, Nov. '54).

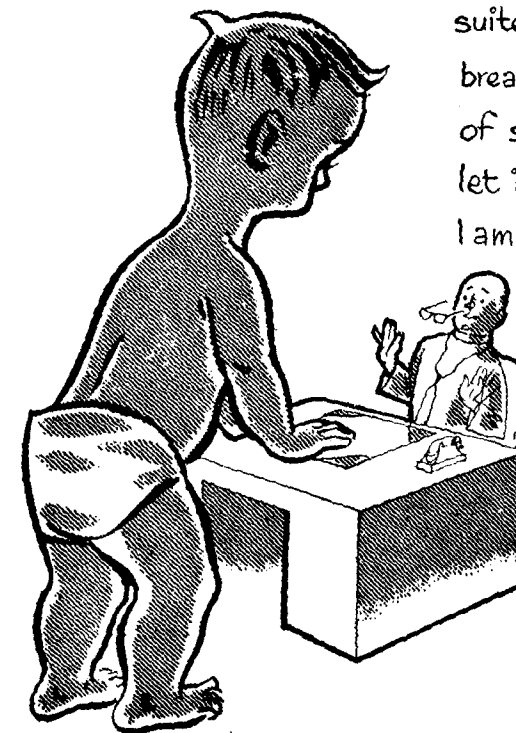
I concede, of course, doctor, that there's nothing like mother's milk, but what happens when mother cannot feed me? And in any case, after five months, you know mother's milk often does not suffice. And what with all this I hear about the extreme importance of the first two years of life in determining the physical development achieved at maturity, I just cannot be too careful. They even tell me that there's a definite relation between height at two years and that at maturity. Just imagine!

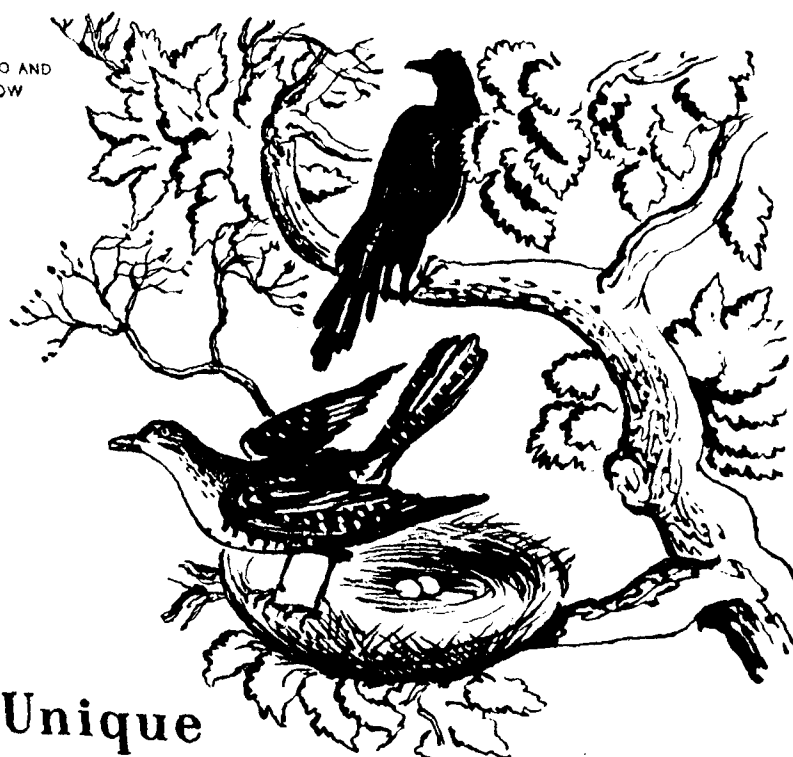
if my word counts it will be **DUMEX Baby Food**

You'll, therefore, understand my anxiety to get myself off to a good start in life. Now I hear from absolutely dependable sources that

DUMEX BABY FOOD is ideally suited to fill the gap between breast feeding and the intake of solids. So, for me, doctor, let it be **DUMEX BABY FOOD**.

I am informed that it is available in 2 sizes—1 lb. and 3 lbs. and somebody called **DUMEX LIMITED** has marketed it.



THE CUCKOO AND
THE CROW

A Unique Combination

Every doctor knows the fundamental importance of Vitamin B and the usefulness of Glucose in nutrition. VYBROSE is a unique preparation presenting these substances in combination. VYBROSE is particularly useful in tropical practice where conditions of B avitaminosis are encountered with great frequency. The daily dose of VYBROSE provides a reasonable supplementary intake of easily assimilable carbohydrate and of the Vitamin B factors.

VYBROSE is of particular value as a dietary supplement for children. And in all cases likely to be complicated by a lack of Vitamin B.

VYBROSE

A UNIQUE COMBINATION OF GLUCOSE AND VITAMIN B

Each ounce contains:

Anserine Hydrochloride		1 mg.
Riboflavin		2 mg.
Nicotinamide		10 mg.
Hydrous Dextrose		1 oz.



Literature and further information on request to:

BOOTS PURE DRUG COMPANY (INDIA) LTD., P.O. BOX NO. 680, BOMBAY



The Antiseptic

A Monthly Journal of Medicine and Surgery

Published on the 8th of every month

Founded by the late Dr. U. RAMA RAU in 1904

Editor: U. KRISHNA RAU, M.B., B.S., M.L.A.

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

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

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

Vol. 52

JUNE, 1955

No. 6

SELF-SUFFICIENCY IN DRUGS FOR INDIA

It is indeed a matter for gratification that during the last eight years, after we obtained our Independence, mighty efforts have been made to achieve self-sufficiency in many of our requirements. This is true also of some of the drugs in popular use. We have now our own Penicillin Factory at Pimpri where other antibiotics besides Penicillin will eventually be manufactured. Then there are the DDT. factories one at Delhi and the other which will shortly be established at Alwaye. A new Quinine factory in the Anamalais was opened on the 14th May by Shri Sri PRAKASA, the Governor of Madras. This will be the third in India.

During the Second World War when enormous quantities of quinine were needed to meet army and civilian requirements, the Madras Government ordered a large scale expansion of the Chincona plantations on the Nilgiris. At the same time they ordered the construction of a new factory in the Anamalais on the most up-to-date lines. The Madras State Government indeed took a very bold step in doing so. For, when it is remembered that their Naduvattam factory (which was started in 1871) had been working at a loss during the last four years and that the competition of synthetic antimalarial products and the heavy imports of quinine from other countries seriously affected the demand for the indigenous product, the starting of this new factory must be reckoned as a bold step. But then we are told by the Madras State Minister for Agriculture that this factory will work for the first 3 or 4 years on the Central Government's account, extracting their bark from the Russian method areas cultivated as a joint enterprise by the Madras State and the Union Governments. The old Naduvattam factory alone will continue to function for the Madras State, which has so far invested about 2½ crores of rupees in the Chincona Industry. The new synthetic antimalarials which have been responsible for the decline in the popularity of quinine

[471]

as a 'specific' for Malaria, are considered to be superior to quinine in many respects. We however, know now for instance, that the earlier claim that Paludrine was effective in suppressing paroxysms with just a single dose, is untenable. Most malarial workers in the field firmly believe that quinine still holds its own in acute paroxysms. As Col. SANGAM LAL, the Director of Medical Services, Madras, has recently pointed out "this becomes quite obvious when it is realised that quinine is most effective against the organisms in their most resistant 'amœboid' forms. Also in the grave emergency of cerebral malaria, quinine by the intravenous route is the most dependable treatment." There is considerable evidence according to him, in recent literature to show that relapses in B.T. malaria are fewer, when treated with quinine followed by pamaquin or primaquin and hence the combined treatment is definitely superior to any of the newer synthetic anti-malarial drugs used alone. There are other uses for quinine of minor importance, *e.g.*, tonics and bitters, and compounds with urea hydrochloride used for injecting into internal piles.

There is thus no reason to think that the starting of a third factory will be either unnecessary or superfluous or that the quinine of Madras have approached the Union Government for a guarantee for the off-take and price of quinine and pending a decision thereon, they have decided to defer further increase in the area of plantation. This is indeed a wise step. Further, the Government of India have recently banned practically all imports of quinine products and have also appointed a sales agency for the distribution of quinine products with a view to increasing the sales. The Government should also do more to advertise and market products of all the three quinine factories, as the main reason for the poor sales, compared to the consumption of quinine products in the country (about one lakh pounds per year mostly as the sulphate) is reported by the Director of the Madras State Chincona Department to be want of adequate publicity and propaganda. India will no longer need to import quinine from foreign countries when the new factory goes into production and supplements the output from the factories in West Bengal and Naduvattam (Madras).

While we are on the subject of self-sufficiency in drugs, it is relevant to refer to other valuable drugs like *Rauwolfia serpentina*, which has been found very effective in hypertension. A press report dated 17th May 1955 issued from New Delhi is somewhat ominous, as this highly valued medicinal plant is now reported to be in short supply (obviously due to the heavy exports that have been made during the last few years) and is apparently getting scarce in the Himalayan region; a team of botanists from different points of India who combed the plants' habitats recently returned without getting a single specimen! The States of West Bengal, Assam

Jammu and Kashmir have started cultivating this plant on a fairly large scale, and the Forest Research Institute at Dehra Dun is making good progress in this direction. Though no ban on its export has so far been placed by the Union Government, the Government of Orissa where the plant grows in abundance, is reported to have refused permission to export it out of India. Perhaps this is to be welcomed, in the context of India's present ability to manufacture many of the specifics, hitherto imported from foreign countries at enormous prices. We earnestly hope that the research into the indigenous drugs of India will progress from strength to strength and eventually make our great country self-sufficient in the matter of drugs required to safeguard her people's health.

THE PROMOTION OF MENTAL HEALTH

WE are glad to know from a statement made by the Madras State's Health Minister at Ootacamund that he will shortly convene a conference of the State Director of Medical Services and the Superintendents of the Mental Hospitals in the State to discuss the condition of these hospitals, obviously with a view to effecting the necessary improvements.

The Bhore Committee in their comprehensive report had pointed out that the proportion of mental patients in India may be taken as 2 per 1,000 of the population but we have hospital accommodation only for about 11,000 beds for such patients in the whole of India. There are also no adequate out-patient facilities, and this is indeed a tragedy 'as persons who could be helped to become good citizens and parents are pushed into the desert waste of insanity.' To cope with mental deficiency, special educational facilities and institutional care of children suffering from various mental conditions, and treatment in Institutions for a considerable proportion of the mentally deficient adults is urgently required. The provision for the care and treatment of the mentally ill in Madras State is deplorably inadequate. There are now only two mental hospitals one at Kilpauk and the other at Kozhikode and both are terribly overcrowded; many who badly need treatment are unable to get admission for want of accommodation. During the last quarter of 1953, there was a daily average of 1852 patients as against the sanctioned strength of 888 in the Madras Mental Hospital, and the Kozhikode Mental Hospital had a daily average of 664 against the sanctioned capacity of 364. These are figures from the report of the Director of Medical Services, issued as a supplement to the report already published on the administration of the three Mental Hospitals for the first nine months of 1953 for the composite Madras State. It is needless to say that congestion of this sort imposes considerable strain on the doctors, nurses and attendants besides being a menace to the health of the patients.

In their order issued in October 1954 reviewing the above report, Government have merely stated that "the general hygiene of the patients in the two hospitals continued to be fairly satisfactory!" We learn that the Budget sanction for 1955-56 for the two mental hospitals does not provide for any expansion or construction of new buildings planned and sanctioned some years ago to provide for the comfort and improved environmental conditions conducive to the rapid recovery of patients. In a booklet published by the Director of Information of the Madras Government, in 1953, Dr. JOHNSON, Superintendent of the Madras Mental Hospital deplored the lack of the essential facilities for undertaking the improved methods based on modern advances in psychiatry and psycho-therapy. He said that while only some of the buildings built in recent years appeared modern in their conception, the older buildings still retained their formidably barred cage-like appearance,—the result of the ancient prison-conception of Mental Hospitals—which is least conducive for any amelioration in the mental condition and outlook of the patients. "Every effort is being made to prevent this impression gaining ground amongst the patients by gradually rearranging and equipping the wards on the same lines as ordinary hospital-wards, and giving freedom to the patients, by keeping the doors open during day time, and encouraging patients to sleep out on the verandahs at night." But adequate progress has not been made for want of accommodation, staff and other essential facilities.

Man in modern society lives in undreamed-of stresses, insecurities, and uncertainties. Forces of disintegration in houses, work-spots and in society are generally on the march. Civilization itself is threatened on all sides. "Space and time are no longer axiomatic but are mathematical forms of relationship intertwined and dependent on the observers." In the result, mental worries and consequent temporary aberrations are on the increase. These require prompt attention and treatment like any other physical ailment to save the individual from dementia and other serious disorders.

Time was when people did not believe that insanity was curable and could also be prevented. Science has since taught us that early diagnosis and specific psycho-therapy will remedy ailments. The present day 'asylums' are no longer lunatic asylums but are 'cured' or 'greatly improved.' Within the last few years the treatment of mental diseases has advanced by leaps and bounds, and progressed so rapidly and so thoughtfully that by planned occupations, removal of infective foci, and induction of shock (electrically or by drugs) in patients, the chronic course of many types of mental derangement has been arrested and recoveries speeded up in other forms of mental disorders.

We have repeatedly stressed in our columns during the last seven years and more, the urgent necessity for providing considerably larger grants, sufficient to increase the accommodation and other facilities in all State hospitals, the chronic overcrowding in which has been the subject of frequent animadversion in the lay and medical press and on the floor of the legislatures; and we reiterate the same with all the force that the problem warrants. In addition every District Hospital should have mental clinics attached to it on the lines of those established in the Madras General Hospital, and psychiatric services should be developed so as to enable retarded children to grow up into healthy, active and alert individuals.

REJOICE WITH US DEAR READER!

(Further extracts from Reviews of our Golden Jubilee Issue)

"Archiva Medica Belgica," Vol. 9, Fasc. 5, 1954 :

"In commemoration of the 50th anniversary of its foundation, the interesting Indian review The 'ANTISEPTIC,' which is published in Madras, issued in April 1954 an important Jubilee number. It includes about 50 contributions from eminent collaborators, Indian as well as foreign; the articles range over practically the whole field of medicine. This number is a new proof of the vitality of medical science in India, and we are happy in paying our tribute to it."

"Medical Times," Brooklyn, N.Y., Mar. '55 :

"This special Golden Jubilee issue of The 'ANTISEPTIC' consists of over 500 pages and gives a concise picture of medical practice today. Issued to commemorate 50 years of continuous publication, its three score articles cover the whole gamut of medical science. Although most of the articles originate in India, several outstanding medical men from other parts of the world have contributed to it.

Indian medicine is ancient and is now being studied with renewed interest due especially to the recent use of alkaloids extracted from *Rauwolfia Serpentina*, the root of which has been used as medicine in India for a long time.

The editor is to be congratulated for his selection of material and a task well done."

REHABILITATION AND TUBERCULOSIS

A study was made by Warren to discover whether any differences could be discerned between a group of persons with tuberculosis who participated in a vocational rehabilitation programme and a comparable group who did not participate in such a programme. The finding indicated that the participants in the vocational rehabilitation programmes exhibited considerably lower mortality and the relapse rates than the non-participants. Psychologic studies also indicated that there were a greater number of non-participants declared to be maladjusted than participants.

A vocational status follow-up showed that 85 per cent of the participants were employed, in contrast to only 47 per cent of the non-participants. Furthermore, it was evident that after discharge the non-participants reverted essentially to their preadmission-occupational status. While the participants exhibited a clear-cut trend out of the service and unskilled occupation into the professional, clerical and skilled categories. Regardless of the criteria used for comparison, this study indicated that participation in the vocational rehabilitation programme produced consequences which were definitely significant to the persons who participated, to the rehabilitation agency which provided the services and to the community as a whole.—(Am. Rev. Tuberc., 69 : 153, 1954, via G.P., 10 : 3, 1954).

OPHTHALMOLOGY

Intraocular foreign bodies; report of 102 cases.—(*Brit. J. Ophthalm.*, 1954, 38: 369 via *Internat. Abst. Surg.*, March 1955).

An intraocular foreign body is a surgical emergency and it is important to keep operative procedures simple; however, there is no universally accepted best method of treatment apart from the extraction of the foreign body from the globe, when possible. Controversial points in treatment are the anterior or posterior route of extraction, diathermy of the scleral field, or simple incision and the type of magnet that is preferable.

Rubinstein mentions recent reports on the management of intraocular foreign bodies, the material concerned being mostly World War II cases.

The present study consists of 102 consecutive cases seen from 1944 to 1953. The criterion for inclusion in this series was that the foreign body should have penetrated the eye, and hopelessly lacerated eyes were included only if the foreign body was lodged within the globe.

All cases were treated according to the same surgical principles; that is, all foreign bodies localized in the anterior chamber or lens were extracted by the anterior route and those in the vitreous were extracted by the posterior route. No attempt was made to incise the globe over the foreign body in acute cases. The quadrant of the globe was selected according to the localizing X-ray chart. The usual posterior entry was through the pars plana, the ora serrata region being invaded only in cases of extreme posterior localization. Diathermy was not used. Antibiotics were used extensively.

Statistical evaluation of the 102 cases indicated that the peak age was from 25 to 40 years with a primary incidence in males—about 30 to 1. The occupations were those of steel workers, mining auxiliaries, and engineering, and at the time of the accident, the

worker usually was using hammer and chisel or hammer on metal. The time of the accident showed little relation to possible fatigue or illumination, though there was an unexplained high incidence of intraocular foreign bodies in the summer months. About 95 per cent of the foreign bodies were steel and the right eye was involved in approximately 60 per cent of the cases. The route of entry was through the cornea in about 60% of the cases, with X-ray localization of the foreign body in the vitreous in about 70 per cent of the cases. In 83 of the cases the foreign body was extracted—26 by the anterior route and 57 by the posterior route. In 19 cases the foreign body was not extracted and in 4 of these extraction was not even attempted—in 3 because of the severe damage and in 1 case because the foreign body had been present 30 years and the eye was quiet.

The anterior route of extraction in this series showed much better results; the reason is obviously not the choice of surgical procedure but the fact of the anterior location of the foreign body.

In summary, the author acknowledges that the series is too small to draw firm conclusions but that certain impressions were formed.

Exact X-ray localization and "over the F.B." approach with the magnet is not essential. Retinal detachment is not frequent in the posterior approach. It occurred in only 7 per cent of the cases and it seemed that the original trauma to the retina and vitreous body caused these detachments rather than the surgery. Established vitreous infection was not controlled by antibiotics; 10 out of 12 eyes so affected had to be enucleated; however, antibiotics seemed to have a prophylactic value in this respect. A quiet eye with retained metallic foreign body must be kept under observation, but the author felt that in the few patients who retained good vision and were trouble-free for years, the foreign bodies were usually embedded in the sclera and encapsulated.

[476]

Cataract sutures.—(*Brit. J. Ophthalm.*, 1954, 38: 345 via *Internat. Abst. Surg.*, March 1955).

Although 30 years ago no sutures were used by most surgeons in routine cataract operations, today some type of suture is almost always used for the wound. During the past 15 years much has been written on the subject of cataract sutures, particularly with regard to the materials used and the tissue reaction produced by them, as well as the advantages and disadvantages of various techniques.

Hughes lists his criteria for the ideal sutures as follows:

1. They should be fine and pass smoothly through the tissue.
2. They should be dyed to be easily visible for handling and picking up during operations.
3. They should be sufficiently strong to hold the tissues together.
4. They should be quite flexible and remain so during the operation.
5. They should produce a small soft knot which can, if desired, overlie the cornea without damaging it.
6. They should not loosen after being tied.
7. The material should not crack or fray during manipulation.
8. The ends should be soft and lie flat so that they do not stick into or irritate the tissues.
9. They should produce minimal tissue reaction.
10. They should disappear spontaneously in about 10 days, leaving no sign of their presence. No further manipulation should be necessary at any time after the operation has been completed.
11. It should be possible to attach them simply and easily, or they should come attached to fine sharp needles that will pass through the eye tissues with little resistance.
12. The junction between the suture and the needles should be smooth, not larger than the diameter of the suture, with no protruding shoulders, edges, or ends that will catch on tissues and cause any injury in passing through.
13. The needles should be tough and not break easily on being grasped with the ordinary needle holders now in use.

14. The needles should be uniformly sharp with a moderately curved cutting edge.

15. The most useful length of suture is about 14 inches.

16. The material should not swell, shrink, or weaken on being soaked in ordinary sterilizing solutions.

17. The sutures should be amenable to being sterilized and resterilized without losing any of their qualities.

18. They should be easily obtainable and reasonably priced.

Various materials were tried by the author. Fine black silk was the first type of suture used. It was flexible and strong; it knotted well, and produced as little reaction as any other suture; however, it had the disadvantage of having to be removed postoperatively and it led to such accidents as springing the wound with loss of the anterior chamber and hyphema.

Monofilament and braided nylon were tried next and had the same objectionable features as silk.

No. 0000 and 00000 plain gut sutures were tried; the former was found to be too coarse and produced too much tissue reaction. The latter produced very little more reaction than the nylon or silk but the sutures were too coarse and the needles were not fine enough for fine cataract surgery. A No. 000000 plain gut suture was tried but disintegrated in too short a time—4 to 5 days. Next a mild chromicized No. 000000 gut suture with a sharp needle was made and found to be satisfactory in most respects except that it could not be coloured satisfactorily and was not easy to see without being dyed. It was not as flexible as it should be and it was thought that as it held for 14 to 24 days this period was excessively long. The author also thought that the knots were too hard to be placed over the cornea and that the needle swaging was sometimes faulty although this has been somewhat corrected.

The author's criteria for the proper closure of a cataract wound are summarized as follows:

1. The cornea and scleral margins of the wound should be accurately approximated and amenable to quick sealing by the healing process.

2. The closing effect of the suture should extend along the limbus as far as possible. A mattress suture is thought to be best for this purpose.

3. The portion of the suture in the cornea should be placed before the eye is opened.

4. The corneoscleral loop of the suture should not include the margin of conjunctival epithelium covering the limbus or the edge of a conjunctival flap.

5. The closure should be strong enough to resist an intraocular pressure of considerable force (at least 80 mm. Hg

was selected as an arbitrary figure) for the first 4 to 5, and preferably 7 to 8 days.

The author states that after trying most of the suturing techniques described in the literature he has developed a procedure which is most satisfactory to him. This procedure is a modified Stallard suture so that the edges of the conjunctival flap are kept out of the wound, somewhat after the manner used with the McLean suture.

Reference might well be made to the complete article by those who like a Stallard type of suture but wish to modify it in an advantageous manner.

DERMATOLOGY

Cortisone and hydrocortisone in skin diseases.—(*Lancet*, Annotation, Sept. 25th '54).

Cortisone appears to cure no skin disease permanently, but it averts death in some hitherto fatal conditions (*e.g.*, pemphigus) and it relieves many distressing chronic disorders (*e.g.*, severe atopic dermatitis). Sulzberger and Witten have investigated the effects of long-term cortisone therapy in skin disease. They report no untoward reaction to the drug, and no instance where progressively larger doses were required to relieve symptoms. Surprisingly, there were no cases of addiction in their series: many patients became dependent on the drug, but when some other treatment gave relief it was always possible to wean them from the drug. Some patients benefited from oral doses of as little as 5 mg. every third day, which seems to indicate that suggestion played a part.

Sulzberger and Witten decided that it was justifiable to give very large initial doses to patients with the hitherto fatal diseases, especially as the unavoidable side-effects of such doses (*e.g.*, glycosuria and psychosis) disappear when the dose is reduced. An initial daily dose of 300–1000 mg. was required in some cases. If the initial dose was more than 500 mg., this was reduced at the rate of 50 mg. a day; if between 25 mg. and 500 mg., at the rate of 25 mg. a day; and below 25 mg., reductions at the rate of 5 to

12.5 mg. often at intervals of three to four days. Total relief of symptoms was not attempted, since a dosage large enough to give this is apt to cause side-effects. Sulzberger and Witten suggest that to avoid side-effects a maintenance dosage of not more than 100–125 mg. a day should be reached as quickly as possible; many patients, tolerated such a dosage for more than year. If exacerbations occur the dose must be temporarily increased, and the case frequently reviewed. Patients receiving more than 300 mg. daily were given a salt-poor diet, supplemented by 3 g. of potassium chloride daily. Continued high dosage made repeated laboratory examinations necessary, and from time to time long bones were examined radiographically for signs of decalcification. When the dose was less than 75 mg. daily the patient's weight, blood-pressure, and mental state were reviewed fortnightly. Sulzberger and Witten believe that with these precautions, and in suitable cases, the long term treatment of dermatoses with systemic cortisone is safe and effective.

Local applications have mostly proved ineffective; but hydrocortisone has been found useful in the local treatment of several distressing minor skin disorders, even when applied generously to wide areas. A 1% hydrocortisone ointment has been applied to an eighth of the body surface for as long as eight months without ill effects. Local hydrocortisone is apparently of little

or no value in the treatment of psoriasis, chronic discoid lupus erythematosus, or alopecia areata; but it is sometimes effective in chronic itchy dermatoses, including atopic dermatitis, anogenital pruritus, and eczema of the eyelids and external auditory passages. Improvement is almost always temporary, and relapse ensues after the drug is withdrawn.

The main disadvantage of local treatment is its cost. In the National Health Service hydrocortisone ointment is available only through hospitals, which pay 7s. 2d. for 5 g. of 1% hydrocortisone-acetate ointment, and 14s. 4d. for the same quantity of 2.5% ointment. A gramme of ointment covers little more than six square inches of skin, a prescription may have to be repeated indefinitely; clearly this remedy should be applied temperately, after the need for it has been fully established. Gratifying as it may be to relieve a patient's pruritus in this way, one should first be sure that she is not excreting sugar in her urine or secreting a primula in her bed room.

Blood picture in sulphone treatment of leprosy: relation with the dose and blood concentration of the drugs.—(*Intern. J. Leprosy*, 22: 1, 1954 via *Leprosy in India*, Jan. 1955).

The investigation was carried in 4 groups of patients (5 in each group). The following drugs and doses were employed, all being administered by the mouth. (1) 0.66 gm. of bis. methylene sodium sulphonylate, daily, equivalent to 0.333 gm. of DDS, (2) 0.9 gm. of the same compound, daily, equivalent to 0.555 gm. of DDS, (3) 0.2 gm. of diaminodiphenylsulphone (DDS), 3 times a week, (4) 0.4 gm. of DDS daily. In the discussion that follows the article, Nahas *et al* consider that the anaemia resulting from oral sulphone treatment is of a haemolytic nature.

Haematologic changes have been studied in patients treated with different doses of diasone—diaminoxil, the Butantan Institute equivalent of diasone, 4'-diaminodiphenylsulphone—N', N' (bis-methylene sodium sulphonylate)

—and pure diaminodiphenylsulphone—DDS—by mouth.

The results show that blood concentration of DDS over 0.6 mg. per cent induced a moderate, progressive anaemia. Blood concentrations smaller than that amount did not cause any alterations.

Daily doses of 0.333 and 0.555 gm of DDS in the form of diasone gave the same blood level. Thus the larger dose of this drug is excessive, presenting no advantage.

The group of patients treated with 0.4 gm. of pure DDS daily presented a mean blood concentration of practically 1.0 mg. per cent. Toxic reactions, chiefly anaemia, appeared in all of those patients.

It was also observed that the blood concentration of DDS does not depend solely upon the amount of active substance contained in the drug. Toxic reactions and anaemia observed in patients who received 400 mg. of pure DDS did not appear in the group treated with 555 mg. of DDS as diasone. The blood level seems to be related to the chemical composition of the drug, and individual variations may be seen.

The detection of the anaemia by haemoglobin determinations is held to be a safe index of the optimal individual dosages. When anaemia occurred, normal blood values were attained after the treatment interruption without the use of antianemics."

The selection of drugs for chemotherapy research in leprosy (NG. PH. BUU HOI).—*Leprosy in India*, Jan. 1955 from *Intern. J. Lep.*, 22 1, 1954).

Selection of drugs for clinical work in leprosy is beset with three main difficulties, viz.: (1) Failure to cultivate or transmit *Myco. leprae*; (2) prolonged treatment necessary; (3) ethical and economic considerations. A set of empirical rules for the selection of substances to be submitted for clinical work in leprosy is proposed viz.: (1) the drug must have tuberculostatic activity; (2) it must have in addition definite fungistatic properties (*e.g.*, DDS, thiosemicarbazone, cyclopentenol

acids from chaulmoogra oil, which are also soluble in lipoids); (3) the toxicity should be little and there should be few side-effects; and (4) it should be easily manufactured and cheap. From these

considerations, two drugs, according to the author, are worth trying in leprosy, viz., drugs of the sulphonamide group (4,4'-diaminodiphenylsulphonamide) and thiocarbanilides.

OBSTETRICS AND GYNAECOLOGY

A five year study of elderly primiparas.—*Am. J. Obst. and Gynaec.*, 66: 1235-1247, December, 1953).

This study of 277 elderly primiparas delivered at the Methodist Hospital of Brooklyn in the years 1943 to 1947 shows the major problems of this group of patients and their infants. The elderly primipara is here considered to be a woman who is delivered of her first viable child at 35 years of age or over.

This is an excellent and painstaking study and discloses clearly the advantages of accurate records and intelligent evaluation. The article is timely since the elderly primipara, as a source of potential disaster, is wholly disregarded in some quarters. The incidence of caesarean section mentioned by the author is high, but justly so, because of the importance of the baby.

Ninety four per cent of these patients were delivered on the private service whereas only 71 per cent of all obstetric patients were on private service. Of the 279 infants of these 277 patients, 134 were males and 145 were females.

Prematurity occurred in 8.24 per cent of the elderly primiparas. Stillbirths totalled 4.3 per cent as opposed to 3.4 per cent for all obstetric patients. Neonatal deaths constituted 3.2 per cent as opposed to 1.6 per cent for all obstetric patients. There were 3 cases of Mongolism for an incidence of 1.08 per cent, compared with 0.14 per cent for the 11,053 other births at the hospital during this time.

Labour was rapid for 46 patients (under six hours), normal for 161 patients (6 to 20 hours) and prolonged for 50 patients (over 20 hours). Twenty patients had elective caesarean sections.

Breech presentations occurred in 20 cases, but since one occurred in twins, the corrected total of 19 gives a 6.8 per cent incidence. The 25 year

average at the Methodist Hospital for primiparous breech presentations, excluding multiple pregnancies, is 4.6 per cent.

Thirty-seven of the 47 caesarean sections were performed primarily or secondarily because the patients were elderly primigravidas. Concern for the safety of the infant, because of the fewer years of reproductive potential in these patients, appears to carry more weight in the consideration of caesarean operations in these patients than in younger primigravidas.

Forty-two (15 per cent) of the 277 elderly primiparas had histories of one or more previous abortions.

There were 13 cases of toxæmia among the elderly primiparas, or 4.7 per cent, as compared with 270 cases for all obstetric patients, or 2.2 per cent.

As compared with other hospital obstetric patients in this study, elderly primiparas more often seek private care, and they have a caesarean section rate over four times as great, a premature rate half again as great, a doubled neonatal mortality rate, an incidence of Mongolism 8 times as great, and a doubled incidence of toxæmia.—(*Author's Abstract*).

The treatment of female genital tuberculosis with streptomycin and para aminosalicylic acid.—(*Am. J. Obst. & Gynaec.*, 66: 823-829, October 1953.)

Eighteen consecutive cases of genital tuberculosis treated with PAS and dihydrostreptomycin are presented. The average dose of streptomycin was 1 g. per day. When side-reactions to PAS appeared, the minimal effective dose has been found to be 5 g. per day. If necessary, the drug may be stopped for several days, then started again at the aforementioned 5 g. per

day. The duration of combined drug therapy was 3½ to 4 months. PAS may be used for its supposed effects long after the tubercle bacillus has become resistant to streptomycin.

Although our objective has been to give both drugs for as long as possible in an effort to avoid surgery, it has been found that advanced forms of genital tuberculosis still necessitate extirpational procedures. The beneficial effects of combined therapy follow the same pattern as those outlined for streptomycin. The addition of PAS to antitubercular therapy has lessened the possibility of relapses and recurrences.

The clinical peculiarities of genital tuberculosis are such that diagnosis may easily be inaccurate. Five of these 18 patients were subjected to initial surgery with a diagnosis other than genital tuberculosis. The other 13 were correctly diagnosed and managed accordingly.

The recent introduction of isonicotinic acid hydrazines in no way minimizes the value of combined PAS and streptomycin therapy.—(*Author's Abstract*).

Recurrent ectopic pregnancy.—(*Am. J. Obst. & Gynaec.*, 66: 626-636, 1953).

Cook and Butt of Cleveland City Hospital, note that about 15% of patients operated upon for ectopic tubal pregnancy subsequently require contralateral operation. The patient with an occluded residual tube rarely conceives; if the residual tube is patent but damaged, a common occurrence, a second ectopic pregnancy is likely.

Hysterosalpingographic examination after surgery for ectopic pregnancy gives good evidence as to which patients are likely to have recurrences and as to prognosis. The residual tube is studied for abnormalities in length, position, tortuosity, and patency. Displacement by extrinsic masses, is demonstrated and hydrosalpinx readily diagnosed.

Postectopic tubal damage is caused by the original ectopic pregnancy,

resultant surgery, or pelvic inflammation. Intraperitoneal blood, with subsequent clotting, organization, and formation of peritubal adhesions, may favour repeated tubal pregnancy. Hence, the prompt evacuation of blood in cases of acute ruptured tubal pregnancy decreases chances of injury to the remaining tube.

The advisability of leaving a damaged residual tube when operating for ectopic pregnancy is questionable, since sterility is better than the risk of another tubal pregnancy.

Tying the umbilical cord.—(*N. Eng. J. Med.*, April 1954—*Pract.*, Aug. '54).

The effect on the new-born infant's blood count of four different methods of clamping the umbilical cord was studied by A. E. Colozzi. A series of 100 unselected consecutive normally delivered infants were divided into four equal groups and dealt with as follows:—*Group 1*—The infant was placed on the mother's abdomen (above the level of the placenta), and the cord was clamped after the arteries had stopped pulsating and the vein no longer filled. *Group 2*—The cord was clamped immediately after delivery. *Group 3*—The infant was placed on a table (below the level of the placenta), and the cord was slowly and methodically stripped from the vulva to the umbilicus. The cord was clamped when it was no longer distended with blood; usually four to eight strippings were necessary. *Group 4*—The infant was placed on a table (below the level of the placenta), and the cord was clamped when all pulsation and distention had ceased. Blood counts were made 24 and 72 hours after birth. The average red cell counts (in million) at 72 hours were: 5.82 in group 1, 4.78 in group 2, 6.47 in group 3, and 5.8 in group 4. The corresponding values for hæmoglobin (g. per 100 ml.) were: 17.08, 14.71, 18.96, and 17.30 respectively. There was no difference in the four groups in weight and general condition of the infants, but they were only observed for five days. On the other hand, cord stripping or delayed cord clamping or both are urged to effect a

maximum placental transfusion in infants who are shocked after a traumatic delivery, anæmic after a bleeding accident before or during labour, delivered by caesarean section or born prematurely.

Treatment of tuberculous endometritis.—(via *The Practitioner*, Feb. 1955).

One is not now justified in withholding treatment from any patient with proved tuberculosis of the endometrium. This is the conclusion of A. M. Sutherland (*Journal of Obstetrics and Gynaecology of the British Empire*, October 1954, 61: 614), based upon a carefully controlled study of 109 cases, in all of which extra genital tuberculosis had been excluded. There were 57 patients in the 'treatment' group, and they were given 1 g. of the calcium chloride complex of streptomycin daily by the intramuscular route for 84 days, along with 3 g. of PAS orally every day for the same period. All patients were ambulant throughout treatment and many continued at their job. The 52 patients in the 'control' group were given no active treatment. Of 27 of the patients in the 'treated' group who have been followed up for one year, there were 24 (89%) in whom there had been no further evidence of endometrial tuberculosis, whilst the condition had recurred in three. In another 18 patients, whose follow-up was less than a year, there has been no recurrence. In 25 cases in the 'control' group with a follow-up of one year, the endometrium still showed evidence of tuberculosis in 20 cases; among 14 patients followed up for less than a year, the endometrium was positive in six, and negative in eight. Clinical deterioration occurred in 10 patients in this group, which necessitated immediate treatment. Toxic reactions occurred in four of the patients in the 'treated' group, though in no case were there any permanent ill-effects. He adds: 'In future, it is hoped to reduce the incidence of such toxic reactions by using streptomycin sulphate instead of the calcium chloride complex.'

Prevention of hyaline membrane after caesarean section.—(*J.A.M.A.*, Dec. 18, 1954 from *Med. Jour.*, Australia of 4.9.1954).

Hyaline membrane is one of the major causes of death in infants delivered by caesarean section. The Boston theory is that hyaline membrane is the result of aspiration of amniotic fluid into the respiratory tract and the precipitation of the protein content in the alveolar ducts. A baby delivered by caesarean section is in great danger of inhaling this fluid, and so Pash decided that an attempt should be made to suck out the respiratory passages of the baby before this aspiration could take place. After the incision into the lower segment, blood and liquor are sucked away, and the excess is removed by swabbing. If the head is low, the baby is usually delivered by the face, and in this case the assistant as soon as the mouth is accessible, places a catheter in the mouth; the mouth and pharynx are cleaned before the child's head is delivered. This suction is maintained throughout the delivery of the head, and sucking out of the mouth and pharynx is continued while the child's body is delivered, and then the child is held with its head down. As soon as the cord is clamped and cut the assistant, carrying the child with the head low, takes it to a cot, which is inclined with head down at an angle of 30 degrees, and the stomach is then emptied of ingested liquor with a mucus catheter. If the head is high, suction is instituted as soon as the mouth is accessible, and delivery is delayed until the airway is reasonably clear. With the use of this method there were no deaths from hyaline membrane in 60 elective caesarean sections.

Pregnancy and heart disease.—(*Acta Obst. Gyn. Scand.*, 1954, 33: 162; *Int. Abst. Surg.*, March 1955).

Werko reviews the present views on heart disease, especially with regard to pregnancy and its influence on the heart and circulation.

Heart disease complicating pregnancy is not common. The rate is from 1.5 to 3.0 per cent. However, heart disease

and toxæmia of pregnancy still contribute to most of the maternal mortality rate.

The pathophysiological picture of various forms of heart disease is presented. However, all of these studies were made on nonpregnant individuals. Pregnancy causes innumerable changes in the blood and circulation both in normal women and in patients with heart disease. There is a successive increase in the total blood volume up to the ninth lunar month of pregnancy. The blood is diluted with extracellular fluid which gives an increased tendency towards oedema. The blood pressure decreases towards the middle of pregnancy and increases again towards term. Venous pressure is increased in the legs but is unchanged in the upper extremities. The skin blood flow and the renal blood flow increase. The renal blood flow is markedly increased during early pregnancy and back to normal values at the end of pregnancy. The intrathoracic blood load remains the same until the last month when it is diminished and it increases again during the puerperium.

The management of patients with heart disease in pregnancy will vary with the individual case. Ideally it should start before pregnancy. Infections and anemia are two threats that constitute real dangers for patients with heart disease in pregnancy, as they may easily tip the balance towards oedema.

Alterations of the heart rhythm constitute a special problem. It seems as if pregnancy in some way may increase the tendency towards extrasystoles or paroxysms of tachycardia.

Intelligent management calls for close collaboration between the cardiologist and the obstetrician throughout the pregnancy, in addition to an intelligent patient who will rest when instructed to do so. Indications for caesarean section should be only on obstetrical grounds. It is believed that after the fourth month of pregnancy intervention may be more dangerous than life-saving.

Mitral valvotomy in pregnancy.—(*J. Obst. Gyn. Brit. Empire*, 1954, 61: 382; *Surgery, Obst. Gynaecol.*, March '55).

The results of valvotomy carried out in pregnant women cannot yet be assessed in view of the recent origin of the operation, but perhaps the following tentative remarks may be made:

1. Valvotomy during pregnancy, in certain selected cases, has been successful over a short period.

2. Selection must be very careful and should be made by physician, obstetrician, and thoracic surgeon in close co-operation in view of the hazards of the operation.

Two case histories of patients operated upon during pregnancy, whose cardiac status improved subsequent to the surgery, are presented.

The use of oestrogens after the menopause.—Current Comment. *Med. J. Austral.*, 5-3-1955).

There are still doubts as to the value of the administration of oestrogens during, but especially following the female climacteric. Shelton has discussed the present position particularly in relation to supposed contraindications. The initial purpose of oestrogen production in the female is undoubtedly the preparation of the organism for procreation. This involves all those changes, after the onset of puberty, which make the female attractive to the male. With oestrogen deprivation both the psyche and the soma suffer. There is frequently regression to a shell of the former alluring woman. Sexual misunderstanding may occur and lead to serious family difficulties. The person ages physically and mentally at least in so far as her ego is concerned. Aside from philosophical and sexual aspects of this problem there are several outstanding physical changes which may ensue following oestrogen deprivation.

There are two types of women—physiologically speaking—at the climacteric. One type suffers rather sudden and complete deprivation of oestrogen followed by rapid changes in skin and bone, atrophic changes in the breast and generative organs and severe autonomic instability. The other type may cease to menstruate, but, as shown by good vaginal cornification, continues

to elaborate submenstrual levels of oestrogens for an additional ten or fifteen years. In the latter the symptoms of oestrogen deprivation occur much more insidiously and may not become grossly apparent until the sixth decade of life. This is why many physicians feel that all women who complain are vapid and neurotic—because they see other women who are practically devoid of symptoms of the menopause. Oestrogen substitution therapy can be of great help to many women of the first class. In the past fifty years the life expectancy of the human female has increased from 49.7 to 72.4 years. Formerly most women who survived into the fifth and sixth decades expected to be and actually were, senile in both appearance and perspective. By reason of freedom from crippling disease, better nutrition, clever use of cosmetics greater social freedom and smarter raiment, the grandmother of today can hold her place with women even twenty years her junior—provided she remains in some degree physiologically intact.

What are the supposed contraindications for the use of oestrogen substitution therapy? First, the fear of cancer, especially of the breast and genital tract; second, the fear of producing post-menopausal uterine bleeding; third, the fear of prolonging the physiological adjustment to the menopause until the fifth or sixth decade; fourth the feeling that the menopause is a natural phenomenon and should not be tampered with. In spite of much that has been written there is no sound evidence that oestrogen or any other hormone initiates, generates, or produces cancer. A consideration of the amount of oestrogen used in treatment

and of the incidence of cancer in the human female supports this statement. Seven hundred kilograms of oestrogens are manufactured in or imported into the United States of America every year. If one milligramme of oestrone is considered the unit dosage, this amount would be enough to treat 7,000,000 women twice a week with one milligramme of oestrogen. If oestrogen was carcinogenic the incidence of malignancy of the breast and sex organs would have been much greater in 1950 than in 1930 when few if any women took oestrogen. Yet the death-rate was essentially the same in both years. In regard to endometrial hypoplasias women are susceptible to oestrogenic preparations in varying degree, and the dose, preferably by mouth, for any woman past the menopause should be below the level likely to cause bleeding. This may be gauged by experiment. This argument that one prolongs, or rather postpones, the physiological adjustment to the menopause by oestrogen administration is usually answered by the women themselves. Most of them are happy to be relieved of the burden of menstruation and the fear of a late and unwanted pregnancy. There is nothing wrong with having the objective evidence of deterioration in the sixties instead of in the forties. The final argument, that of tampering with nature, can have no validity to day with all the interferences that one accepts as progress. The use of oestrogens as a physiological and gerontological tool is an individual and not a general problem. Every patient must be examined and followed and treated as an individual, and suitable patients (and their number is legion) will profit by oestrogen administration.

SURGERY

Operation for undescended testes.
—(*J. Internat. Coll. Surgeons*, 21: 472-476, 1954, via *Mod. Med.*, 15-9-54).

Enrico Beltrame, M.D. of S. Martino Hospital, Genoa, Italy, describes a technique employing orchidofunicolysis, free replacement of the gland, and shortening of the excursion of the testis to the

scrotum applicable to all types of undescended testes.

Normal size, position, and sensation of the gland, as well as spermatogenesis, may be provided in all varieties of testicular non-descent by an operation that is most successful for the prepubertal boy.

JUNE '55]

GLEANINGS FROM THE MEDICAL PRESS

209

For the subcutaneous and inguinal variety of undescended testes, the external ring is cut and the inguinal canal opened widely. The gubernaculum is divided and the ends ligated. The processus vaginalis peritonæi is opened by a transverse incision and separated from the structures of the cord. To obtain additional length, the elements of the cord above the internal ring are removed by blunt dissection. The peritoneal opening is then closed with a purse-string suture.

The posterior wall of the inguinal canal is opened and the cord and testis are passed beneath the epigastric vessels; the route of the testis to the scrotum is thereby shortened. An adequate scrotal bed is prepared manually through the inguinal incision, and the freed testis is placed in normal environment, free of compression. The inguinal incision is closed.

If the undescended testis is still within the abdomen, the cutaneous incision is lengthened upward and paramedially to the umbilical transverse line. The inguinal canal is opened, and the external oblique, internal oblique, and transversus muscles above the internal ring are split down to the peritoneum. The peritoneum displaced medially is entered above the internal ring. The posterior peritoneal layer is carefully freed and the opening into the peritoneal cavity is packed with gauze.

The posterior layer or peritoneum is separated from the gland until the vas and vessels appear. The vas is freed medially to the seminal vesicle and spermatic vessels and upward as far as the abdominal portion of the aorta. Gentle traction brings the testis down, the peritoneal opening is closed, and the testis and cord are passed below the epigastric vessels.

A perineal passage is then made behind the inferior ramus of the ischium for the resting place of the testis in the scrotum. The pelvic retroperitoneal fat is freed, and the levator and urogenital diaphragms are opened.

With the patient in lithotomy position, a finger bulges the anterior peri-

neum from the pelvis, behind the inferior ramus of the ischium. Over the finger, 1 cm. from the ischium and 2 cm. below the symphysis, a knife is used to cut through the skin and subcutaneous tissue. The levator ani muscle is split from the inferior surface, and a forceps is introduced through the perineal incision, grasping and bringing the testis outside the perineum.

An incision is made in the previously prepared scrotal bed and joined to the perineal incision by a subcutaneous tunnel. A clamp then drags the testis and cord through this tunnel and into the scrotum.

Reconstruction of the inguinal canal, plastic repair of the abdominal wall, and closure of incisions conclude the operation.

Hernias in the poor risk patient; their surgical management.—(*Surg. Clin. N. America*, 34: 761; 1954, *Surg. Obst. & Gynec.*, March '55).

Hernias in the aged and poor risk patient come to surgical management either as acute emergencies or when evaluated for elective operation. Because of recent advances in anesthesia and in maintaining fluid and electrolyte balance, it can be said that any patient who is ambulatory can be carried safely through a herniorrhaphy. In emergency situations, even poorer risk patients may be safely operated upon.

When incarceration or strangulation is present, one must evaluate the patient for intestinal obstruction and if it is present immediate decompression with the Miller-Abbott tube should be attempted. Evaluation of the fluid and electrolyte balance and attempts at correction must be made. Persistence in either of these forms of treatment must not be too strenuous because often the relief of the incarceration or the strangulation will be the only means of curing both of these ills. Digitalization of patients in cardiac failure must be instituted. If urinary retention exists, an indwelling catheter should be inserted.

In the patient in whom an elective herniorrhaphy is considered, optimal preparation should be emphasized. Cardiac failure should be relieved by digitalization. Electrolyte balance should be restored if necessary. Preliminary transurethral resection for prostatism should be performed when indicated. Concerted effort should be made to clear any pulmonary infection, and in the event of the presence of an allergic bronchitis, an attempt should be made to desensitize the patient to his allergen.

Spinal anaesthesia offers the best muscle relaxation but it may be contraindicated in certain cases. A drip of anesthetic may be preferable. Local anaesthesia in many patients is the anaesthesia of choice.

In discussing factors in technique, Warren stresses the importance of opening the peritoneal sac in all hernias, direct and indirect, in order to eliminate the hernia completely and to rule out an associated indirect or femoral hernia in the case of a direct hernia. In the last, the sac is always opened nearest the internal ring to avoid bladder injury. Silk, cotton, or other nonabsorbable suture material is used. Restoration of the defect of the transversalis fascia is emphasized. Reinforcement of this repair is essential and may be the only part of the repair possible when the transversalis fascia is markedly attenuated. In these cases the musculofascial bundle along the lateral rectus sheath is sutured either to the shelving edge of Poupart's ligament or to Cooper's ligament. It is stressed that with careful attention to the anatomy, this type of repair will be adequate and that resort to grafts will rarely be necessary.

Femoral hernias are repaired through an oblique inguinal incision when uncomplicated. A lower vertical rectus incision may be added when release of an incarcerated or strangulated hernia is difficult or when resection is necessary.

If obesity is corrected, ventral hernias may usually be repaired without the use of tantalum mesh or grafts, but both of these methods may be needed in advanced cases.—*Surgery, Obstetrics & Gynaecology*, March '55).

Therapy of primary breast cancer.—L. H. Garland, M.D., Stanford University, San Francisco, writes. (*Am. J. Roent.*, 71: 1954).

"Mammary carcinoma is fundamentally a problem of cancer outside the breast. When the disease is confined to the breast, simple mastectomy is often sufficient. When tumour has spread beyond the breast, radical mastectomy cures only those patients with disease confined to the chest wall or axilla.

The Halsted radical mastectomy is of greatest value when the tumour has spread by lymphatic routes only. Unfortunately, recent evidence indicates that frequent as lymphatic metastases, Sternal bone marrow examination often reveals involvement in early cases. Apparently, the vertebral veins contribute to this early spread by allowing reflux of tumour emboli to ribs, pelvis, femur, and humerus before metastases appear in the lungs.

Breast lesions are not considered operable when: (1) more than one-third of the skin of the breast is involved with oedema; (2) satellite nodules exist in the breast skin; (3) carcinoma is inflammatory; and (4) the cancer is locally far-advanced.

Because a large number of breast cancers are already beyond the scope of surgical removal when first seen and because radical operation may actually shorten survival time of some patients, simple mastectomy in combination with radiation has definite advantages:

The procedure is safer and has a lower morbidity rate than radical surgery. Complications such as post-operative arm oedema are fewer. Less handling of cancer tissue reduces spread of tumour emboli. The patient may resume useful work earlier than after the radical procedure. Post-operative radiation therapy does not delay removal of a potential solitary focus in the breast. The five-year survival rate is as good as that generally reported with radical surgery.

Disadvantages include (1) failure to control radio-resistant but locally removable extra-mammary cancer; (2) potential failure to secure adequate radiation dosage in obese patients; (3) hazards to the lung apex in patients with

active upper lobe tuberculosis; (4) possible tissue injury if the procedure is not done meticulously; and (5) prolongation of therapy for two to three weeks after surgery.—(*Modern Medicine*, Feb. '55).

Total gastrectomy for gastric cancer.—(*Modern Medicine*, Feb. '55).

Samuel F. Marshall, M.D., and Herbert Uram, M.D., Lahey Clinic, Boston, state that total gastrectomy for cancer of the stomach does not increase the five-year survival rate and is not always justified. A high incidence of cures results only when surgery is performed early for malignant tumour which is limited to the stomach.

Initial symptoms include epigastric pain and discomfort, anorexia, and nausea. Vomiting, weight loss, hematemesis or melaena, and anaemia are often late manifestations. Achlorhydria is noted in about one-third of patients.

Roentgen diagnosis is accurate in over 90 per cent of instances. Cytologic

and peritoneoscopic studies are valuable when the radiologic procedure fails. Gastroscopic examination is employed to differentiate gastric ulcers, gastric polyps, and chronic gastritis.

Malignant tumours of the stomach may metastasize to regional lymph nodes, blood vessels, and adjacent organs. Cancer always extends beyond the visible and palpable limits of the lesion. To extirpate cancer, complete excision of regional vascular and lymphatic drainage area is mandatory, and is practically impossible.

Total gastrectomy should be employed only when the radical procedure is necessary to resect all diseased tissue and complete removal seems possible. The surgeon should be prepared to extend the abdominal incision into the thoracic cavity if necessary and should be able to proceed with a radical total removal of the stomach and complete excision of all lymphatic drainage areas. Excision of the pancreas, transverse colon, and left lobe of the liver may be necessary.

MEDICINE AND THERAPEUTICS

Control of diabetes.—(*Brit. M. J.*, 4844: 1023-1026, 1953).

Insulin preparations designated as lente, semilente, and ultralente provide diabetic control without causing local allergic reactions. Given to 28 patients with diabetes previously well regulated with various combinations of soluble and by various combinations of soluble and protamine zinc insulin, the preparations effected better diabetes control, in 14, equally good in 7, and definitely poorer in 2. Inconclusive results were observed in the remaining cases, report Drs. Ian Murray and Robert B. Wilson of the Victoria Infirmary, Glasgow. Similar in action to mixtures of soluble and protamine zinc insulins, lente insulin eliminated the necessity of making the currently used mixtures; action was more even in some cases. Ultralente had a more prolonged action than protamine zinc insulin and did not lose potency when small doses of semilente were added, thus avoiding separate injections. Semilente acted similarly to soluble insulin. Patients with insulin

lumps received immediate and complete relief with the lente insulins, and no local allergic reactions occurred in any instance.

Jaundice due to methyltestosterone therapy.—(*Annals of Internal Medicine*, 40: 146, January 1954).

There is increasing evidence that a distinct type of hepatic damage is produced in some patients by the administration of methyltestosterone.

A case of jaundice following the administration of methyltestosterone has been reported by Almaden and Ross which is the nineteenth such case to be reported in the medical literature. Although a severe and progressive jaundice occurs, the usual laboratory tests for hepatocellular damage are negative. Complete recovery follows discontinuation of the methyltestosterone.

The patient received 10 mg. of methyltestosterone daily for 1 to 4 days. The dosage was then increased to 20 mg.

daily for 116 days, after which the methyltestosterone was discontinued. During a period of 230 days the patient received 3.36 gm. of methyltestosterone. The jaundice was noted by the patient after she had been taking methyltestosterone for 178 days. She had received 2.53 gm. of the drug by this time. She continued to receive methyltestosterone for 49 days after the onset of the jaundice.

The microscopic appearance of the material obtained by needle biopsy and by biopsy at the time of laparotomy is similar to that described by several other investigators, who regard it as a distinct type of lesion characterized by stasis in the bile capillaries of the central portion of the liver lobule, with no obstruction of the larger bile ducts and without much evidence of hepatocellular damage.

The mechanism of production of this type of jaundice remains obscure, but the premise that the bile is too viscous to follow through the canaliculi seems to be the most acceptable explanation it offered.—(*International Medical Digest*, June '54).

Is blood pressure being read properly?—(*Cur. Med. Dig.*, Dec. '54). From Ciba reports.

Conventional techniques do not give true blood-pressure readings, Dr. Howard P. Lewis told a conference group, June, 24, at the annual meeting of the A.M.A., San Francisco. According to Dr. Lewis, the blood-pressure cuff should be inflated more slowly than is the usual practice and the column should fall at the rate of no more than 2 to 4 mm. per heart beat. Too fast a fall, he cautioned, will give a false reading.

At this same conference, Dr. Charles F. Sweigert, commenting on blood-pressure readings, suggested that serial readings, over a period of weeks or months are necessary before the physician can conclude his patient has hypertension or is a candidate for hypertension. A single examination or a limited series of readings, he stated, is not conclusive.

Nephrotic oedema.—(Symposium, *Internat. Med. Dig.*, Aug. '54).

The nephrotic syndrome has always been a perplexing and discouraging problem to all practitioners of medicine and especially distressing to those dealing with the diseases of children. The characteristic appearance of the bloated child is quite familiar. The chronicity of the condition, the constant danger of complications and the difficulty of relieving the miserable child have always been a challenge that has been difficult to meet.

The oedema which bloats the patient, develops insidiously, and naturally suggests urinalysis, which reveals severe albuminuria and yet there is little, if any, renal insufficiency. There is likewise little, if any, hematuria or nitrogen retention. The first and predominant symptom of the nephrotic syndrome is the oedema. This appears around the eyes and soon there is a great increase in weight obviously caused by its spread over the body. As a precursor of this oedema, we often see an upper respiratory infection two or three days before.

The relief of oedema is urgent in order to afford some comfort to the patients generally miserable with the disease. Many measures have been used more or less successfully down through the years but recently interest has been centred on two new agents for the control of the oedema of nephrosis. These are the cation resins and dextran. The essential principles by which resins and dextran work are quite different. Cation exchange resins increase the loss of sodium from the body, while dextran increases the osmotic pressure of the plasma and so attracts idle water from the oedematous parts, and possibly hinders tubular reabsorption of water in the kidneys.

The studies on the cation exchangers revealed that the gastrointestinal absorption could be effectively blocked, diuresis initiated at times, and mercurial diuresis supplemented by administering cation exchange resins.

The early optimism over the value of these agents in generalized oedema has been sustained, but their use should not

be undertaken unless facilities for competent laboratory control are conveniently available.

The resin permits the daily ingestion of 2 to 3 g. of sodium, with the simultaneous mobilization of the excessive fluid which is retained in the tissues. But no fluid mobilization was achieved with the resin when the patient's ingestion of sodium was unlimited, nor was fluid mobilization seen when the patient was sustained on the 2 g. sodium diet without the resin. Therefore, it seems that the cation exchange resin is a valuable addition to our therapeutic measures in oedema in general and nephrotic oedema in particular.

The problem of controlling the intake of sodium in conditions which require restriction is frequently difficult to solve. Salt-free diets are unpalatable and the fulfilment of the nutritional requirements are, therefore, not easy to arrange. Salt substitutes are not helpful very often and there is frequently a tendency to revolt on the part of many patients.

Mollison and Rennie of the Department of Biochemistry and Medicine of Stobhill General Hospital, Glasgow, Scotland, report their experience in treating nephrotic oedema with intravenous infusions of dextran. Dextran was given on 81 occasions to 8 patients. All were at rest in bed, on restricted salt intake. The dextran was used in a standard commercial 6 per cent salt-free preparation, and three 10 per cent salt-free preparations of large, medium and small molecular size. Diuresis and reduction of oedema occurred with all these preparations, regardless of molecular size or concentration, but the effect lasted longest with the large molecular preparation. In all cases the oedema reaccumulated. Dextran had no adverse influence on renal function, but toxic reactions to infusion were noted in all cases, and consisted of severe headaches, occasional nausea and vomiting, and fever. Two patients developed transient hepatic enlargement; one patient developed fever, dyspnoea, cough and scanty rales at the lung bases after the fourth infusion of small molecule dextran, and another developed the same symptoms though less severely with a similar preparation. The more severe reactor of

these two also showed signs of the greatest increase of blood volume of any of the patients in response to the infusion, and this occurred at the time of his reaction, but skin tests for sensitivity to dextran were negative.

The authors thought the reactions they encountered were not allergic so much, as due to overloading the circulation, which seems to be too infrequently appreciated in intravenous infusions and blood transfusions in general. This was confirmed by the fact that they found that slowing the rate of infusion, reduced the severity of the reaction. It is interesting that subsequent courses of dextran after the first, were effective in producing diuresis in the series of cases.

In this connection, attention may be called to the fact that Olive and associates found that in 2 to 12 children with nephrotic oedema whom they treated with the second course of dextran, the drug failed to cause diuresis even though the first had been quite effective. On the other hand, they noted toxic effects in only 3 of their cases, the reactions being correlated with the use of a preparation of high molecular weight and with frequent molecular branching.

There have been several other clinical investigations on the use of both cation exchange resins and dextran, in the control of nephrotic oedema but, for the most part, they follow the pattern of the results of Mollison and Rennie. Most reports indicate that single infusions of dextran are not very effective in relieving nephrotic oedema. There can be little doubt that both dextran and the resins are effective diuretics and they may succeed when other measures fail. The very nature of the route of administration of dextran, transience of its effects, the necessity of controlling the administration of the resins in a well-equipped laboratory by a skilled technician and the variability of the effects of these agents very clearly indicate that both are still unsuitable for use in domiciliary practice.

Cortisone and phenylbutazone (Butazolidin) compared by Joseph J. Bunim, M.D., Chief of the Arthritis and Rheumatism Branch, National

Institute of Arthritis and Metabolic Diseases, National Institute of Health, U.S.A.

Similarities.—(1) Both agents are antirheumatic drugs which are effective in rheumatoid arthritis, ankylosing spondylitis, and gout.

(2) Both induce retention of sodium and water so that patients with organic heart disease and diminished functional cardiac capacity may develop congestive heart-failure while taking these compounds. (3) Both reactivate peptic ulcers, with resulting hæmorrhage or perforation in some cases. (4) Mechanism of action is as yet obscure.

Differences.—I. CHEMICAL.—(a) Phenylbutazone is not a hormone. It is not a steroid but a synthetic pyrazole derivative.

II. PHYSIOLOGICAL.—(a) Adrenal cortical function.—(i) Phenylbutazone does not maintain adrenal function in hypophysectomized animals. (ii) It does not act directly on the adrenal cortex of hypophysectomized as determined by ascorbic acid depletion test. (iii) It does not alter 17-ketosteroid urinary excretion. (iv) It does not cause eosinopenia or lymphopenia.

(b) Electrolyte balance.—(i) Phenylbutazone does not affect sodium or potassium content of saliva. (ii) It does not cause an increase in urinary potassium excretion. (iii) It does not change the glomerular filtration rate.

(c) Gastric secretion.—Phenylbutazone does not increase uropepsin.

III. CLINICAL.—(a) Improvement in rheumatic diseases following phenylbutazone is not commonly accompanied by reduction in erythrocyte sedimentation rate or disappearance of C-reactive protein. (b) Phenylbutazone does not increase the insulin requirements of diabetics.

IV. THERAPEUTIC.—Phenylbutazone is not indicated in such nonrheumatic diseases as status asthmaticus, atopic dermatitis, drug hypersensitivity, lupus erythematosus, leukaemia and nephrosis.

V. UNDESIRABLE SIDE-EFFECTS.—(a) On blood: Cortisone is not associated with anaemia, granulocytopenia, agranulocytosis, or thrombocytopenic purpura. (b) On the gastro-intestinal

system: cortisone is not associated with stomatitis, hepatitis, anorexia, or nausea. (c) On hormonal balance: phenylbutazone is not associated with manifestations of hyperadrenocortical function such as obesity, "moon face," hirsutism, striae, acneiform eruption, pathological fractures, and increased susceptibility to microbial infection. (G.P., July 1954).

Aureomycin-sulpha combination cures soft tissue infections.—(*Jour. National Med. Assoc.*, 46: 1, July '54).

Sulpha drugs combined with Aureomycin make it possible to treat infected abscesses, ulcers, bites, in-grown toe nails, lacerations and other soft tissue infections with half the usual daily dosage of Aureomycin alone, according to a study at Harlem Hospital reported in the June issue of the *New York State Journal of Medicine*.

Dilorenzo, Wright, and Metzger treated 55 patients admitted to the hospital with fever for acute inflammations, with a daily dose of a half gram of Aureomycin and a little over a half gram of sulphadiazine, sulphamethazine, and sulphamerazine in combination tablets. "Clinical results were as good as those obtained in an earlier study with a daily dose of one gram of Aureomycin used alone." No signs of toxicity appeared which could be attributed to the use of the drug mixture.

The sulphonamides potentiate the activity of Aureomycin *in vivo* when employed against gonococci and gram-positive cocci. Whether this will hold true for infections caused by other microorganisms remains to be seen. The mixture however, enables the effective treatment of certain infections with half the daily dosage of Aureomycin used alone. This lowered dosage will not only reduce consumer cost but also undoubtedly will decrease the number of side reactions to Aureomycin.

Ætiology of headache.—(*Arch. Neurol. and Psychiat.*, 71: 425-434, '54).

Steady recurrent nonpulsatile headache, usually associated with tension, depression, hypertension, or fatigue, may be due to vasoconstriction of cranial arteries in association with

sustained contractions of ischæmic skeletal musculature. Pulse waves from the supraorbital, temporal, and occipital arteries and electromyograms from associated skeletal muscles were obtained of 26 patients with contraction headaches. Data were compared with results derived from 10 subjects who did not have headaches. Extensive vasoconstriction, indicated by significant decreases in the mean amplitude of the pulse wave contours, and a ten-fold increase in the amplitude of action potentials from the involved muscles were observed during episodes of headache, report Drs. Tunis and Woliff of New York Hospital. Relative vasoconstriction, with a smaller amplitude of the pulse wave contour and an increase in size and number of reflected waves, were demonstrable even during headache-free periods in both normotensive and hypertensive patients. Sustained vasoconstriction combined with muscle contraction resulted in headaches more commonly than when either condition existed separately.—(*Mod. Med.*, Short report, 1st Sept. '54).

Goitrogenic effect of PAS.—(*G.P.*, Sept. 1954).

Brinkman and Coates report 11 cases of thyroid enlargement occurring during PAS therapy. In two myxœdema developed. This effect is related to the ability of PAS to depress iodine up-take by the thyroid gland. The thyroid swelling began 4 to 12 months (average 6.7 months) after the start of PAS therapy, with the exception of one patient whose goitre appeared in 7 weeks.

Administration of iodine produced no effects in the two persons in whom it was tried, thus differing from a simple iodine-deficient goitre. Small doses of desiccated thyroid, however, gave prompt improvement to four patients with the disappearance of the clinical signs of myxœdema and regression of the sides of the gland. Continuation of PAS after the appearance of the goitre did not lead to clinical myxœdema or to further enlargement of the gland in several of these patients.—(*Am. Rev. Tuberc.*, 69: 458, 1954).

REVIEWS OF BOOKS AND PERIODICALS

Inventories of Apparatus and Materials for Teaching Science—Volume III Technical Colleges, Part 5, Medical Sciences: By UNESCO-WHO (Agents M/s. Orient Longmans Ltd., 36-A, Mount Road, Madras 2). Price 15/6d.

This book will help in the formation of new departments for the purpose of teaching basic medical sciences and gives a list of equipments used in teaching the under-graduate medical students of anatomy, bacteriology, biochemistry, pathology, pharmacology, physiology and preventive medicine. These inventories may also be used by medical schools reorganising their teaching departments on more modern lines. They will be very useful, as they include all the essential equipments for teaching the modern undergraduate medical student. Equipments for research work have not however been mentioned or included. Textbooks, periodicals and teaching films have also not been dealt with more owing to

language differences. The inventory contains a list of equipments required by the staff also. Opposite each item is the approximate price in dollars. We are sure this little book will be useful to those intending to start new medical schools and also for bringing existing departments more up-to-date and modern. U.K.R.

Materia Medica of Pharmaceutical Combinations and Specialities—By U. B. NARAYANA RAO, Fifth Edition, August 1954. Published by Medical Digest, Girgaum, Bombay-4.

The fact that this thoughtful compilation has gone into its Fifth Edition is adequate proof of its popularity and usefulness to the profession. Dr. Narayana Rao has succeeded in presenting a handy book of reference, containing nearly all the important specialities of world manufacturers with relevant details, as to the ingredients, indications dosages, etc. He has been making

useful additions in every new edition, which help to bring the book more valuable and up to date. Thus in the Fifth edition two new sections have been incorporated, one on sera and vaccines, and the other on poisons, their symptoms and treatment. Within the short compass of 421 pages he has assembled a wealth of information for the ready reference of the busy practitioner, who is flooded with literature about thousands of new preparations that are being daily put on the market and who finds it necessarily difficult to remember or carry them about, in the course of his daily routine practice.

We heartily commend this *vade mecum*, to all medical practitioners, pharmacists and dispensing chemists.

T.N.S.R.

Medical Digest—Special number on Pathology—February '55. (1 Nagindas Mansions, Girgaum Road, Bombay 4).

The special number on Pathology issued by our distinguished contemporary, the *Medical Digest* is a useful compilation containing valuable articles from eminent pathologists and medical men from all over the country. The first article is on 'Pathological Reports and their Interpretation' by Dr. Gollerkeri. Then follow articles on 'Clinico-Pathological Correlation of Lymph Node Enlargements' by Dr. Bhaskara Riddy, 'Interpretation of Pathological Reports on Examination of Urine' by Dr. Choudhuri, 'Urinary Abnormalities' by Dr. Gupta, 'Investigations in Anæmia and their Interpretation' by Dr. M. C. Rama Ayyangar, 'Cerebrospinal Fluid in Disease' by Dr. Modi, 'Liver Function Tests and their Aid in Diagnosis' by Dr. Pathak and Dr. Sharma and 'Laboratory Diagnosis of Malaria' by Dr. Ray and others all of which are well written. We congratulate the Editor on the production of this special number.

U.K.R.

BOOKS RECEIVED

Clinical Bacteriology—By E. JOAN STOKES, M.B., B.S., M.R.C.P., M.R.C.S. Pp. 288. Edward Arnold (Publishers)

Ltd., London. Agents: Orient Longmans Ltd., 36-A, Mount Road, Madras-2. Price 20s. nett.

Notice To Our Readers and Advertisers

The attention of our readers and advertisers is invited to an important communication to us from the Presidency Postmaster, Madras on the subject of "Noting of Post Box Number on all postal articles"

"A large number of articles addressed to persons, firms, banks etc., holding Post Boxes do not bear the Post Box Nos. and the Zonal Nos. in the address. As a result these articles are sorted for the various postman beats, as per address borne on the articles but are returned by the postmen for being delivered through Post Boxes resulting in

wastage of time and labour and consequent delay in delivery. It becomes impossible to sort articles returned by the postmen at the last moment, into the Post Boxes before the prescribed time and this results in complaints of delay from the Post Box holders.

2. I therefore, request that you will issue necessary instructions to all your correspondent clients about the necessity of including Post Box and Zonal Numbers in the address to prevent delay, misplacement and misdelivery."

Our Post Box No. is 166 at Madras-1.

CORRIGENDA

ANTISEPTIC, 52: 5, May 1955 page 366, For 'erections' in line 42, please read 'emissions'.

ANTISEPTIC for May '55: page 75, Advt. of Zaveri & Sons: The price of PAMAQUIN should be read as Rs. 7-8-0 instead of Rs. 6-8-0 per 500 Tabs.

"HEALTH"

A Monthly Journal Devoted to Healthful Living

Founded by the late Dr. U. RAMA RAU in 1923

Editor: U. KRISHNA RAU, M.B., B.S., M.L.A.

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

Annual Subscription:

Inland	Rs. 2-8-0
Foreign	Sh. 5 Post paid
Single Copy	As. 0-4-0

Editorial & Publishing Office:

323-24, Thambu Chetty Street,
MADRAS-1

Dr. U. RAMA RAU'S Hand Book on
FIRST AID IN ACCIDENTS

Revised by: Dr. U. KRISHNA RAU, M.B., B.S.

Explains as to how to render First Aid in Accidents such as:—

Fractures, Concussion, Fainting, Convulsion, Shock, Collapse, Sun-Stroke, Heat-Stroke, Asphyxia, Shock from Electricity and Lightning Shock, Burns, Wounds, Bites, Snake-Bite, Bruises, Strains and Rupture of Muscles, Poisoning, Insensibility, etc.

The book written in popular language and running to 240 pages, Crown 16mo with many illustrations, has been found very useful by the lay public in rendering First Aid scientifically in cases of accidents till the arrival of a doctor. Members of the medical profession have found it useful to deliver lectures to lay men on First Aid.

The book is being published since the First Great World War and has run to several editions and thousands of copies have been sold up to now. It is published not only in English but also in Tamil, Telugu, Canarese, Malayalam and Hindi. Mines, Factories, Police Force &c. use these books largely.

Price Re. 1/- or Sh. 2 per copy for any edition.

Postage 7 As. Extra per copy

Value may be remitted along with the subscription to 'Antiseptic' or 'Health' or both.

COPIES CAN BE HAD FROM:

SRI KRISHNAN BROS.,
323-24, Thambu Chetty St.,
MADRAS-1

The Ideal Remedy
for all Degrees of Acute or Chronic Cardiac Insufficiency

PANDIGAL

It contains the pure crystalline glycosides - the lanatosides A + B + C isolated from the leaves of the Digitalis lanata which produce the complete classical digitalis effect. Pandigal has the following outstanding properties:

- Splendid compatibility
- Easy resorptiveness
- Non-toxic, good therapeutic cumulation
- Ready and exact regulation of dosage

DROPS - AMPOULES - TABLETS

ORIGINAL
Beiersdorf
PRODUCT

P. BEIERSDORF & CO. A.-G. HAMBURG
For India: PARRY & CO. LTD. Madras, Calcutta, Bombay, New Delhi



NETTLEFOLDS
STAINLESS STEEL
HYPODERMIC NEEDLES
ONE DOZEN NO. 1

"...thank you, Doctor!"

Not always an occasion for rejoicing — but your patients will be grateful if you use a Nettlefolds Needle. Look for the Φ symbol — your guarantee of quality.

NETTLEFOLDS HYPODERMIC NEEDLES

Manufactured by: GUEST, KEEN, WILLIAMS, LTD.
and distributed by: NETTLEFOLDS OF INDIA LIMITED
P. O. Box 1502, Bombay-1. Telephone: 38367-8.
Telegrams: "NETTLEFOLD", Bombay.

NP-55-11

3 Lepetit Products Against Tuberculosis

streptotibine

tri-isonicotinylhydrazone pyruvate of dihydrostreptomycin



streptopas

dihydrostreptomycin tri-p-aminosalicylate



nicotibine

hydrazide of isonicotinic acid



Sole Distributors for India

RANBAXY & CO., LTD.

P. O. BOX 104, NEW DELHI

BRANCHES: BOMBAY, CALCUTTA, DELHI, KANPUR, MADRAS

PRINCE DUK

PRC 3

The Latest
and Most Significant Advance
in the Treatment of
PULMONARY TUBERCULOSIS

Since

ISOPASCAL $\bar{c}$ CD Tablets & Granules
VITAZIDE Sugar Coated Tablets

CIAZIDE-50
Cyanacetyl Hydrazide 50 mg. per tablet

CIAZIDE-100
Cyanacetyl Hydrazide 100 mg. per tablet

CYANOPASCAL

Each tablet contains :

Cyanacetyl Hydrazide	.. 20 mg.
Para amino salicylic acid	.. 0.5 gm.
Di-Calcium Phosphate	.. 100 mg.
Vitamin D	.. 250 I.U.

Effective in all forms of

PULMONARY TUBERCULOSIS

More effective in cases resistant to all other drugs

Detailed Literatures and Rates on request from :

THERAPEUTIC PHARMACEUTICALS
Chotani Estate - Proctor Road BOMBAY-7

DISTRIBUTORS:

1. MADRAS :-Therapeutic Agencies, 4, Kondichetty St.
2. KOTTAYAM, T. C. State :-Matteethra Corporation, Muttambalam P.O.
3. CALCUTTA :-Kadride Enterprises, 33, Chittaranjan Avenue, P. O. Box No. 2675
4. PATNA :-C. T. SHAH, P. O. Box No. 64, Bankipore, P. O.
5. AHMEDABAD :-Messrs. Kepadia Ltd., 100, 979/26, Dr. Ank's Blocks
6. COLOMBO, Ceylon :-Messrs. C. M. Gandhi & Co. B8, 979/26, Dr. Ank's Blocks
7. BARODA :-Mr. O. J. Shah, Babji Saden, Sursagar, North
8. JAMMU TAWI :-Mr. Balmakund Sharma, C/o. Messrs. Brij Bal & Co.

3 Reasons
WHY DOCTORS USE



- ★ SURGICOM dressings are manufactured under the most aseptic conditions.
- ★ SURGICOM dressings are guaranteed sterile when packed.
- ★ SURGICOM dressings are known for their superior absorbency.

MANUFACTURED BY
THE RAMARAJU SURGICAL COTTON MILLS LTD.
RAJAPALAYAM.

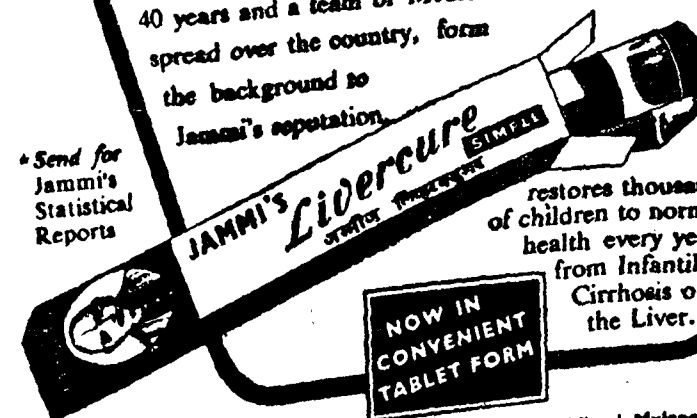
SOLE SELLING AGENTS:

PARRY & CO. LIMITED
MADRAS. BOMBAY. CALCUTTA. NEW DELHI

Experience of over

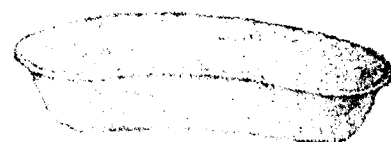
40 years and a team of Medical Men from nine clinics,
spread over the country, form
the background to
Jammie's reputation.

* Send for
Jammie's
Statistical
Reports



NOW IN
CONVENIENT
TABLET FORM

JAMMIE VENKATARAMANAYYA & SONS, 'Jammie Building', Mylapore, Madras-4



Ask for Illustrated Pamphlets of
Stainless Steel Clinical Utensils
for Hospitals, Nursing Homes and
Dispensaries.

We also undertake the repairings of
Broken Record Syringes.

Prices on application

Tel. No. } **BHATIA SURGICAL WORKS,**
41938. } 199, Khetwadi Main Road, Bombay-4

'ROSBAY' a reliable Product for **FILARIA**

The Antiseptic, Sept. writes:

"Rosbay is a combination of Tr. Rosebay
with radio-active element.....It is indi-
cated in Filariasis.....It contains no anti-
mony, arsenic or any vaccine and in cases
where these have failed, Rosbay may be
tried with advantage."

For literatures apply to:

ROSBAY & CO.,
POST BOX 1118, CALCUTTA.

ARSENO- TYPHOID for **FILARIA**

CALCUTTA CLINICAL RESEARCH,

H.O. & Laboratory: 6, Chowringhee, CALCUTTA-13

SINDOL

USED & RECOMMENDED
BY THE BEST DOCTORS
ASEPTICUS CO., G.P.O. 560, BOMBAY I. (A)

RELIEVES PAINS & ACHES



USE
KWIT
for the relief
and
removal of
CORNS

For CHOLERA

There is

CHOLRAGON

Tested in hundreds of Cholera cases with success,
is valuable for diarrhoea and allied stomach
complaints. The following is one of our many
testimonials.

We treated hundreds of cases with this wonderful
remedy for the last 10 years and we are pleased to say
we have been successful in every case.

MOTHER AIMIE. Re: Convent, Dacca
Apply Dept. A

PIXIE PRODUCTS,
27, CAMAC STREET, CALCUTTA-14

LEUCODERMA

Int. & Ext. medicines Rs. 8-4-0.

Dr. B. Gopal Rao, B.Sc., M.B.,
Bangalore:—"Used in cases of Leuco-
derma and found very efficacious."

LEPROSY

45 days' Int. & Ext. medicines Rs. 12-8

Dr. M. Mohabay, Gandhi, C. P. —
"Work marvellously for Leprosy."
V.P. and other charges extra.
BEHAR CHEMICAL WORKS, BHAGALPUR.

FOR

**ELEPHANTOID LEGS, HANDS,
FILARIAL SCROTUM, WEEPING
BREASTS AND EVERY FORM
OF FILARIASIS**

Particulars free from:

SALES OFFICE:

10, Rawdon St., CALCUTTA-16.

THE ANTISEPTIC

CINTHOL SOAP

with **G-11**

(Hexachlorophene)

"A NON-OFFICIAL REMEDY"
— AMERICAN MEDICAL ASSOCIATION

Hexachlorophene and certain products contain-
ing this chemical have been accepted quite
some years back for admission to "New and
Non-official Remedies" by the Council on Phar-
macy and Chemistry of the American Medical
Association.

From the 5th day onwards of daily use of
CINTHOL containing 2% G-11 (Hexachloro-
phene) results in a definite reduction of as
many as 95 per cent of saprophytic and patho-
genic organisms on the skin. It is eminently
suited for use in the surgical scrub-up (reduces
scrubbing time to 3 minutes) in the pre-opera-
tive and post operative preparation of patients'
skin. It affords protection against skin infec-
tions from barber shops, beauty parlours,
hospitals, clinics and wherever there is a more
an average possibility for communication of
disease, and against folliculitis from cutting
hairs. It is also an effective prophylactic agent
in decreasing the incidence and severity of
pyogenic skin infections including acne, car-
buncles, furuncles, miliaria, ammoniacal
dermatitis, impetigo and seborrheic dermatitis
('cradle cap'). CINTHOL relieves and prevents
prickly heat, and is a real deodorant. It is
mild and harmless to the eyes.

CINTHOL

Use it and pre-
scribe it to main-
tain a secure
trouble-free skin.



THE STORY
OF G-11

and medical folder:

Free on request.

Soaps, Ltd.,

P. O. Jacob Circle, Bombay-11.

NAWOJAS THE ORAL THERAPY OF DIABETES MELLITUS

Each tablet contains:-
Insad 11mg; Wang 22mg; Ashrak
Sng; Shilajit 22mg; Prawal 88mg;
Loha 11mg; Excipient 79mg;
Sulphur and copper in traces.
1 to 2 tablets T.D.S.

Proper dosage with careful diet will ensure
control on Diabetes. Reduces both urinary &
blood sugar and normalises Blood Pressure
with amelioration of Diabetic Symptoms.

INDRA LABORATORIES
127, MAHATMA GANDHI ROAD, BOMBAY I

References:-

1. "The Role of Ayurvedic Medicines in the
Treatment of Diabetes Mellitus"—Indian
Journal of Medical Sciences-Vol. 8, No. 2,
Feb. 1952, pp-117-120.
2. "Review of Diabetic Cases Treated with
Ayurvedic Medicines"—"Special Thera-
peutic Number" of the Indian Medical Review

ATHOMIN

A drug which clinically produces
sympathomimetic and Antibacterial
action

ATHOMIN—has clinically proved curative
in Cholera, Obstinate Children's Diar-
rhoea, Non-specific Diarrhoea, Bacillary
Dysentery, Colitis, Severe Food Poison-
ing etc.

ATHOMIN—due to its sympathomimetic
action, stimulates the sympathetic
system, stops effortless vomiting,
arrests salt depletion, reduces hemo-
concentration, improves the pulse in
collapse condition and in furtherance of
its action on the adrenergic nerves,
ATHOMIN quickens some of the impor-
tant organs which once again consid-
erably revive their actions. The anti-
bacterial action (1:40,000) of **ATHOMIN**
makes the stool microbes free within a
short time.

(Presented in Tablets and Injections).

For further information, Please contact:

AEON CHEMICAL INDUSTRIES LTD.,
55, Canning Street, Calcutta-1.

WRITE FOR OUR BONUS SCHEME

GUARANTEE: RELIABLE GOODS - VERY PROMPT DELIVERY
FREE: 25% and 50% postage free on Rs. 250 & Rs. 500 parcel order respectively.
 Packing free for Post Parcel Order.

Adreomycin Spersoids	6-0	Liver Extract 1000 2 U.	2-0	Andrew Liver Salt	1-4
Atoguanil IM or IV Exp. 5A 4-2		" with Vit B & C 1000 TCF 3-8		Voice Tab 100 0-14	1000 6-0
Pentothilin G Cryst.	1	" 5USP 2-1;	10 USP 4-0	Betofat 1-0;	Vidylis 3oz 4-10
0-6-9 0-9-6 0-14-9 Glaxo	2U 2-10; 5U 2-14	Liver Ext. Fort. Vit. B12 20M; 100	10U 3-3	Breastphazide 12x5oz	7-12
0-6-9 0-9-6 0-14-9 Dumex	Normal Saline 100A	Bantonline M&B 4-0,	5oz 20-8	Lacarpal	5oz 4-4
0-7-6 0-10-9 1-1-0 Squibb	Redoxon 2oz 5 2-8;	" 5x2oz 4-0; 25x5oz 18-4		Hyge Syringes naked each in box	9 5 10 20 500oz.
Procain 20 lnc Glaxo 1-11-0	Testosterone Prop. 6 Amp. 1cc.	10mg 3-10; 25mg 4-14; 50mg 8-8		A.C. Jap. 3ap 0-9 0-15 1-2 1-4 3-4	
4 fac Pfizer 0-15-0 Rhodia 0-3-0	" 10cc 25mg. 6-0;	Vit B12 500 100M Glaxo 3-12		Record 2-8 3-4 3-14 6-4 12-4	
Alar 6L 0-9-0 lta. 0-7-6 Sph. 0-10-9	" 10cc 25mg. 6-0;	" Eng. 10 cc. 2-12 200M 4-8		Luerlock BD 0-12 10-0 11-12 17-0 31-8	
" Oily 30 lnc x 10cc 2-12	" 10cc 25mg. 6-0;	" 5cc 500M 6-6 1000M 11-12		Jap Jap 1-4 1-8 1-12 3-4 4-8	
" tab. 12; glax 0-10; lta. 1-12	" 10cc 25mg. 6-0;	" B Comp. 0-12 TCF 2-2		Ro. 1-0 more for side nozzle.	
" Oint doz. Eye 5-4 Skin 8-12	" 10cc 25mg. 6-0;	" Aspirin Eng. 4-8; 1000 Ind. 8-0		M. Cass Jap 2cc 2-4 4cc 3-4 10cc 4-8	
" Lozenges 100 2-2	" 10cc 25mg. 6-0;	" Atebrin Bayer 1000 14-8; 300 4-4		Ind. 1-4 1-8 2-4 2-12 4-10	
Dicistichin	" 10cc 25mg. 6-0;	" Calc Lactas 1000		Lint 3-0;	Cotton -12
Seclomycin 2-0 Amabisteyn 1-5-6	" 10cc 25mg. 6-0;	" Gluconate 1000		Noedies Stainless Steel:	
Streptomycin 1 g. Pfizer 1-3-6	" 10cc 25mg. 6-0;	" Gynomin 1-11;		Eng. 2-12 Down 8-6 doz Record	
French 0-14-0; Gl. 0-15-9 USA 0-15	" 10cc 25mg. 6-0;	" Camoguin 1000 118-0; 3Pit. 0-6-8		" 8-0 8-8 " All Glass	
Synthomycin Kap. 12-8	" 10cc 25mg. 6-0;	" Ephedrine Hyd. 2g 100 0-14 1000 4-12		USA 5-0 Jap 1-10; B.D. 8-8	
Isosonic Acid Hydrate German	" 10cc 25mg. 6-0;	" Easton 100 1-6 1 dr 100 1-14		Thermometers 4min. Nicks 2-8	
100 1-1; 500-5-4; 1000-9-8	" 10cc 25mg. 6-0;	" Cibazol 30 1-10;		Zeal Eng USA Jap. Sup. Plat	
Chloromycin kap 14-14; Hg 11-8	" 10cc 25mg. 6-0;	" Soda Mint 1000 1-8		27-12 18-0 10-12 7-8 8-4 11-8	
G.A.P. 12 cap Del. 7-8; Italy 7-12	" 10cc 25mg. 6-0;	" Mopacrine 1000 11-14; 101 11-14		Erkameter	81-0
Adreomycin 8 cap 17-12; 16 27-12	" 10cc 25mg. 6-0;	" Folic Acid 5 mg 100		Salin app. 300 7-0 500cc	8-8
Terramycin 16 33-8;	" 10cc 25mg. 6-0;	" Multivitamin coated 1000 9-12		Abn. Gauge 20yd	8-8
Quinine Ger. 18-12; Java 46 0	" 10cc 25mg. 6-0;	" Paldria 1000 1 g 21-12 3 g 47-12		Ear or Glycerine Metal Syringe	
oz. 3-2; Howard 6-4 oz	" 10cc 25mg. 6-0;	" Vit. C 100 mg 200 6-12; 50 5-8		2oz 4-8 4oz. 5-8	
" B.G. 41-12 Howards 51-8	" 10cc 25mg. 6-0;	" 500 mg 500 6-2-2; 50 10-12		P.L. ord 1-8	Sup. 3-0 doz.
" Tab 2 gr 2-4 5 gr 4-8 100	" 10cc 25mg. 6-0;	" Pamaquin Tab. 500 0-12 1000 6-12		" Crocodyl finish	4-0 "
" 1000 2gr. 18-8; 5 gr 38-12;	" 10cc 25mg. 6-0;	" Phenobarbita Tab. 15 gr. 100 1-7;		Stethoscope S.D. 20-8; Ger 8-8	
" Howard 5gr. x 1400 50-10	" 10cc 25mg. 6-0;	" Pet. Chloras 1000 3-2 500 2-2		Wall Thermometer Jap. 1-8	
" Blyd. 2 gr 3-14 5 gr 6-8	" 10cc 25mg. 6-0;	" Ribofavin Tab 5mg 100 1-8; 1000 8-0		Vit. C 60 mg 1000 8-2 100 1-8	
Equiline Germ. 3-14	" 10cc 25mg. 6-0;	" Resochta 10 2-5;		" 100mg 100 2-8; 1000 10	
[Howards 4-4; Java 4-0	" 10cc 25mg. 6-0;	" Saridon 10 1-1;		" Vit B Complex 100 1-4 1000 7-8	
Quin. Blyd. 100 x 10gr x 2cc	" 10cc 25mg. 6-0;	" Sulphanilamide 500 3-12 1000 6-12		" B1 10mg, 1000 10-12 100 1-10	
Ind. BDH B.W. EVANS	" 10cc 25mg. 6-0;	" Sulphanilamide Powder		" 5mg 100 1-6 1000 8-0	
12-8 22-0 33-8 29-0	" 10cc 25mg. 6-0;	" Guinadine 1000 10-14 500 5-14		" 10mg 100 1-6 1000 8-0	
8-4 14-12 5gr x 100 amp	" 10cc 25mg. 6-0;	" Boots 500		" 10mg 100 1-6 1000 8-0	
Aminophyllin 6x10 cc. Ger. 1-14	" 10cc 25mg. 6-0;	" Diazine 100 7-4 500		" 10mg 100 1-6 1000 8-0	
Vit. B1 10cc 50mg 1-6; 100mg 1-8	" 10cc 25mg. 6-0;	" Thiazol 1000 Ind. 16-4 Boots 23-0		" 10mg 100 1-6 1000 8-0	
Vit. B1 100 mg 1 cc. 50 A 16-0	" 10cc 25mg. 6-0;	" M & B 693 25 1-10; 500 29-8		" 10mg 100 1-6 1000 8-0	
Campolan 2cc 5 5-10 50 54-0	" 10cc 25mg. 6-0;	" 760 25 1-12; 500 26-0		" 10mg 100 1-6 1000 8-0	
Calcium Gluconate 10% 100amp	" 10cc 25mg. 6-0;	" Nivaguin 500 48-12 100 8-12		" 10mg 100 1-6 1000 8-0	
5cc 7-0 10cc 9-0	" 10cc 25mg. 6-0;	" Sulphaguinadine 500 11-4		" 10mg 100 1-6 1000 8-0	
" Sander 5x10cc 5-0 10x5cc 8-8	" 10cc 25mg. 6-0;	" Selfadiazine 500 35-8 25 2-10		" 10mg 100 1-6 1000 8-0	
" with Vit C 10x5cc 9-12	" 10cc 25mg. 6-0;	" Sulphatriad 100 7-12; 500 8-4		" 10mg 100 1-6 1000 8-0	
" 5x10cc 5-8; 50x5cc 47-0	" 10cc 25mg. 6-0;	" Soda Salicylas tab 1000		" 10mg 100 1-6 1000 8-0	
" Vit. C Ger. 200 mg.	" 10cc 25mg. 6-0;	" Soda Bicarb		" 10mg 100 1-6 1000 8-0	
10x5cc 4-10 10ccx5 amp. 3-10	" 10cc 25mg. 6-0;	" Yeast Tab. 7 1/2 gr 1000		" 10mg 100 1-6 1000 8-0	
Distill Water 100 amp 2cc 2-4	" 10cc 25mg. 6-0;	" Glucose Pow. 4 oz. 0-5, 1 lb. 1-1		" 10mg 100 1-6 1000 8-0	
5cc 3-0 10cc 4-4	" 10cc 25mg. 6-0;	" Vit. K 100A 11-4		" 10mg 100 1-6 1000 8-0	
Emetin Hyd 2gr 100A 11-8 6A 3-0	" 10cc 25mg. 6-0;	" Vit. K 10mg 100 1-4		" 10mg 100 1-6 1000 8-0	
BDH 7-4; B.W. 7-4; P.B. 6A 6-0	" 10cc 25mg. 6-0;	" Dial amp. 5A-1;		" 10mg 100 1-6 1000 8-0	
Emetine 1 gr 12A Eng.	" 10cc 25mg. 6-0;	" Combiotic 1 gr.		" 10mg 100 1-6 1000 8-0	
Emetine 1grx6amp P.B. 6-14 BW 6-12	" 10cc 25mg. 6-0;	" Calc Osteon 15cc 8-8		" 10mg 100 1-6 1000 8-0	
Glucose Sol. 500cc 6A 11-8 8-2	" 10cc 25mg. 6-0;			" 10mg 100 1-6 1000 8-0	
Irgapin 5A 7-4; 6A 85-0	" 10cc 25mg. 6-0;			" 10mg 100 1-6 1000 8-0	
Milk 1/2 lb 10-14 0-13 4-0	" 10cc 25mg. 6-0;			" 10mg 100 1-6 1000 8-0	
N.B. 20 0-11 15 0-13 4-0	" 10cc 25mg. 6-0;			" 10mg 100 1-6 1000 8-0	
10x5cc 5-8; 25 mg 1-2	" 10cc 25mg. 6-0;			" 10mg 100 1-6 1000 8-0	
10x5cc 25 mg 5-8; 10mg 1-2	" 10cc 25mg. 6-0;			" 10mg 100 1-6 1000 8-0	
Live Ext. TCF 10cc	" 10cc 25mg. 6-0;			" 10mg 100 1-6 1000 8-0	

Supplies to Govt. Municipal and Charitable Institutions.

SHANTI TRADING CO.,

Palton Road, BOMBAY-1.

(New Citizen Bank House)

Items not quoted will be supplied at lowest possible Rates

"BATTEN"

SUCCESS



quantitatively and qualitatively
increased antibiotic action
in the intestinal tract
with
CHLOROSTREP SUSPENSION
and
CHLOROSTREP CAPSULES
Synergistic combination of
Chloromycetin and dihydrostreptomycin

CHLOROSTREP SUSPENSION is particularly indicated in the treatment of diarrhoeas and dysentery in infants and children.

This combination of antibiotics as in Chlorostrep has been found to be highly effective for specific conditions such as: salmonella and shigella infections, colonic surgery, tuberculous rectal fistula, chronic anal fistulae and infected pilonidal cysts.

Chlorostrep Suspension is supplied in bottles of 60 cc., each 4 cc. (1 teaspoonful) containing 125 mg. Chloromycetin (as Palmitate) and 125 mg. dihydrostreptomycin (as sulphate).



Chlorostrep Capsules are supplied in bottles of 12 capsules, each capsule containing 125 mg. Chloromycetin (as Palmitate) and 125 mg. dihydrostreptomycin (as sulphate).