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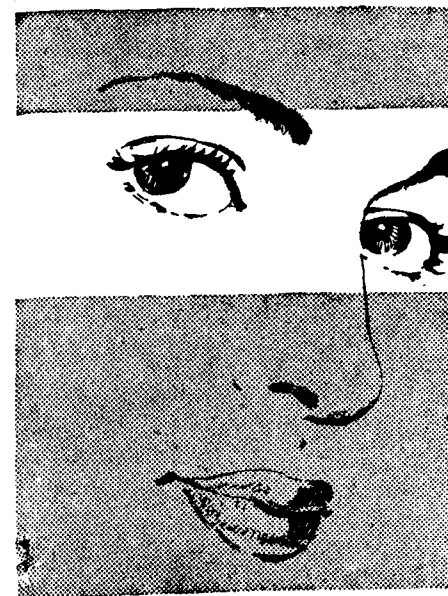
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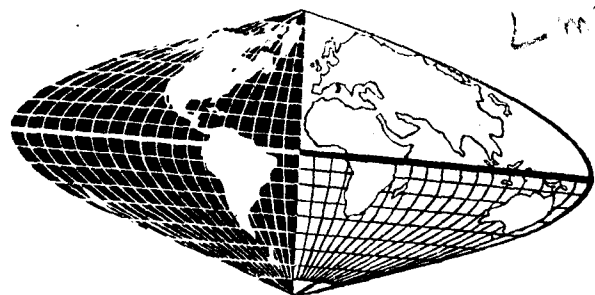
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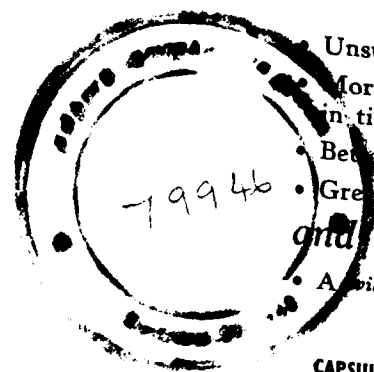
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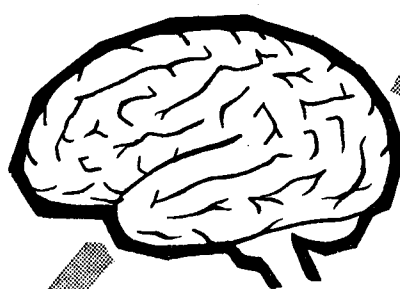
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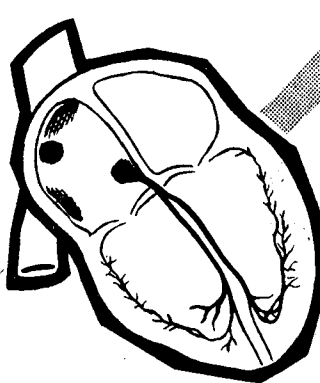


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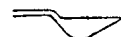
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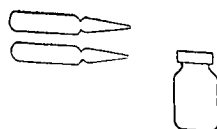
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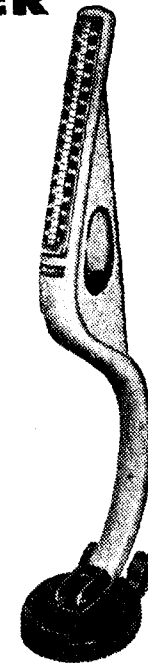
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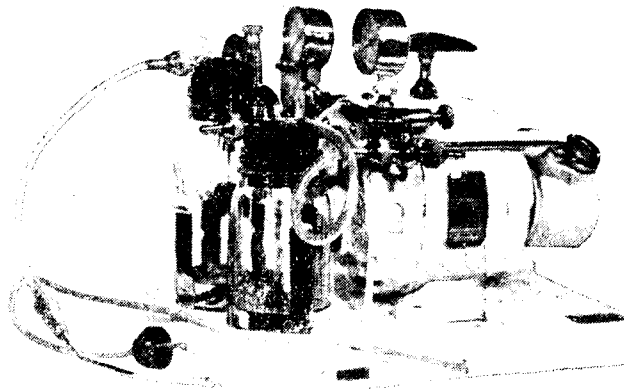
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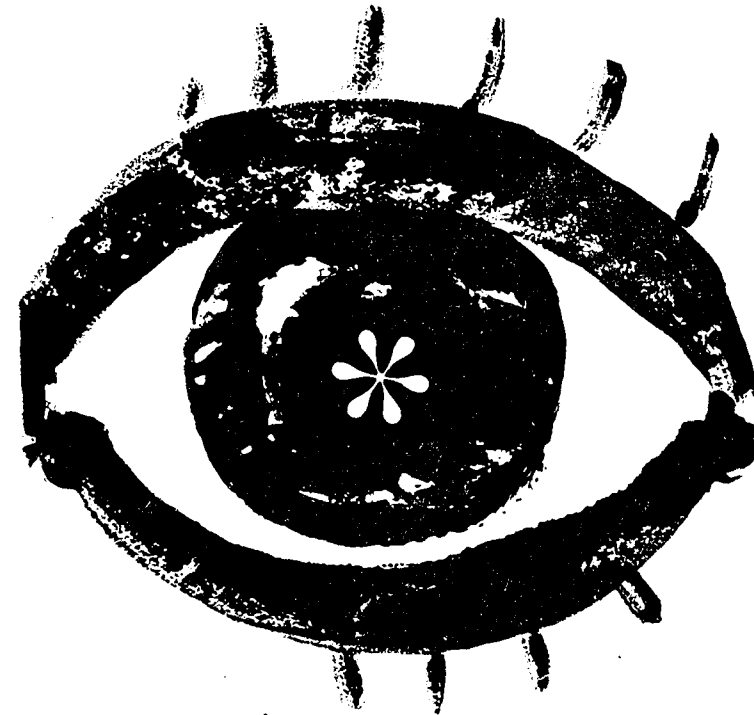


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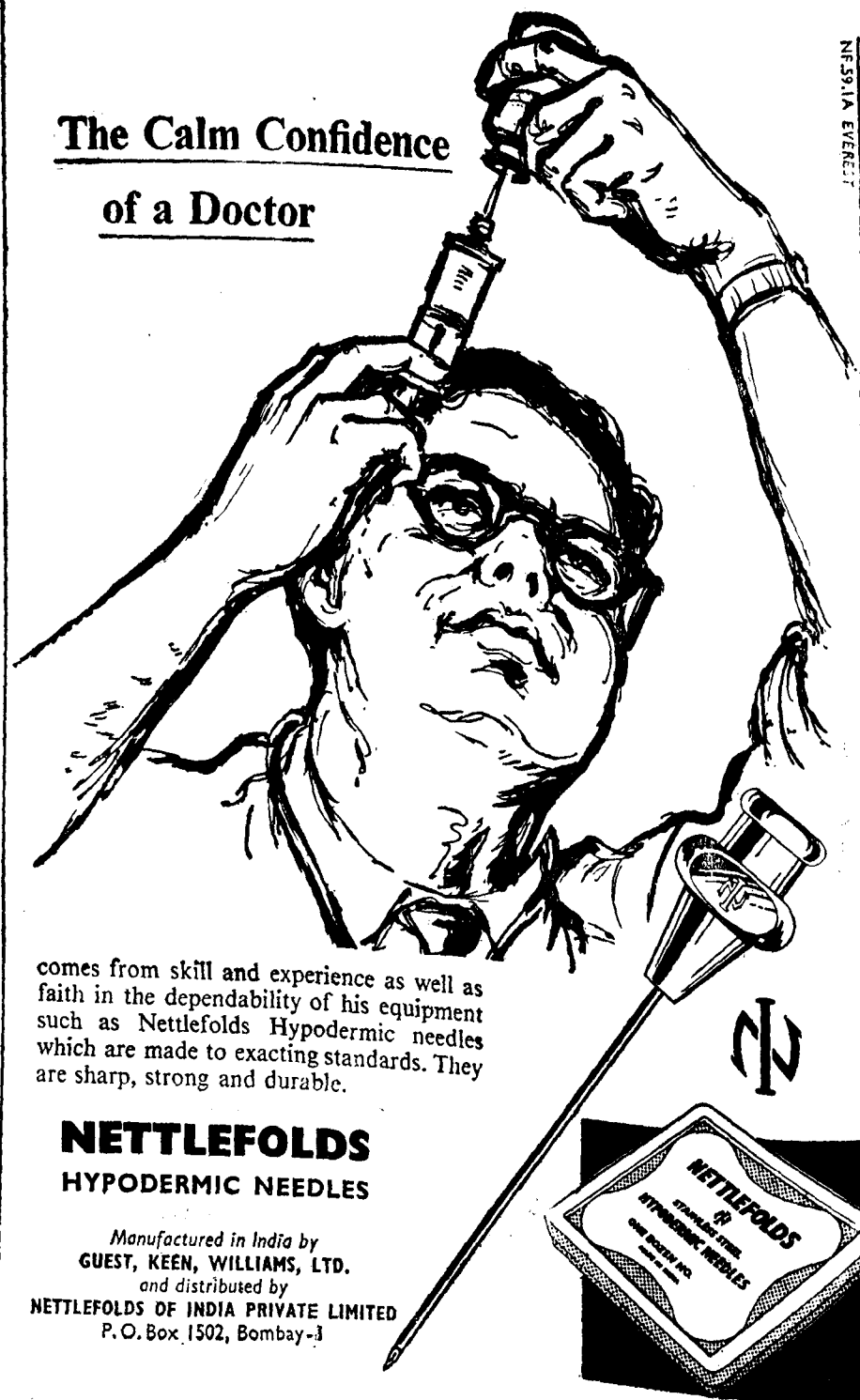
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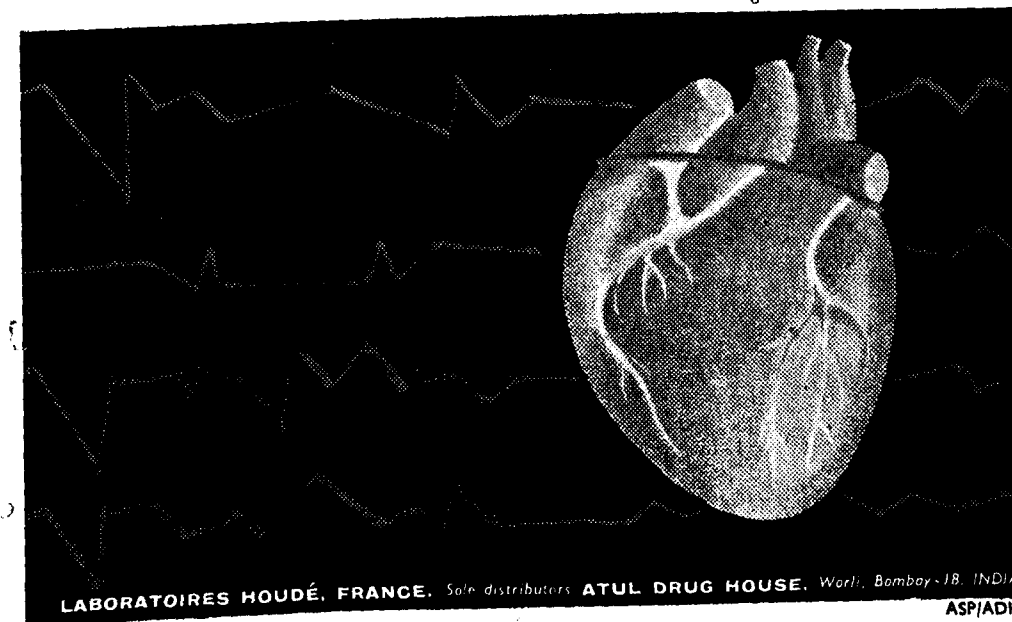
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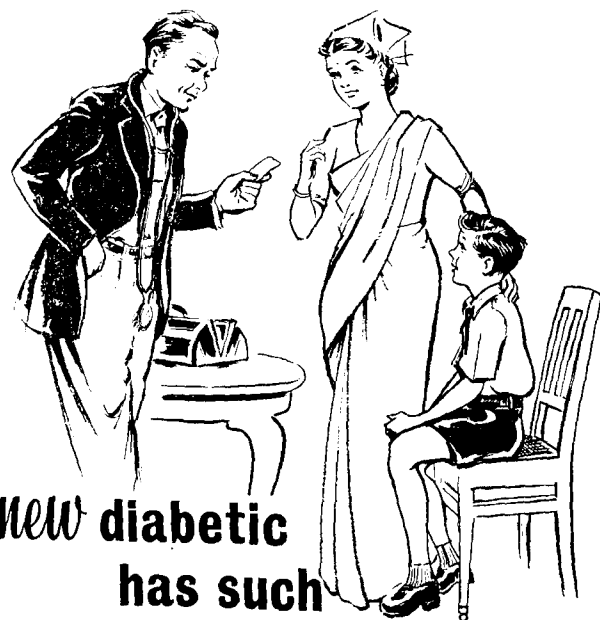
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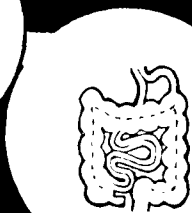
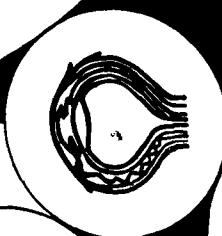
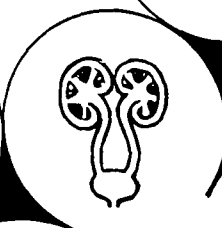
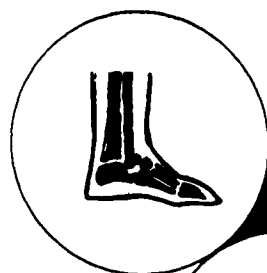
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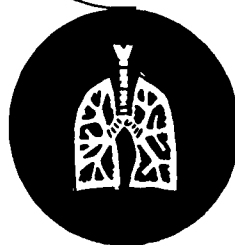
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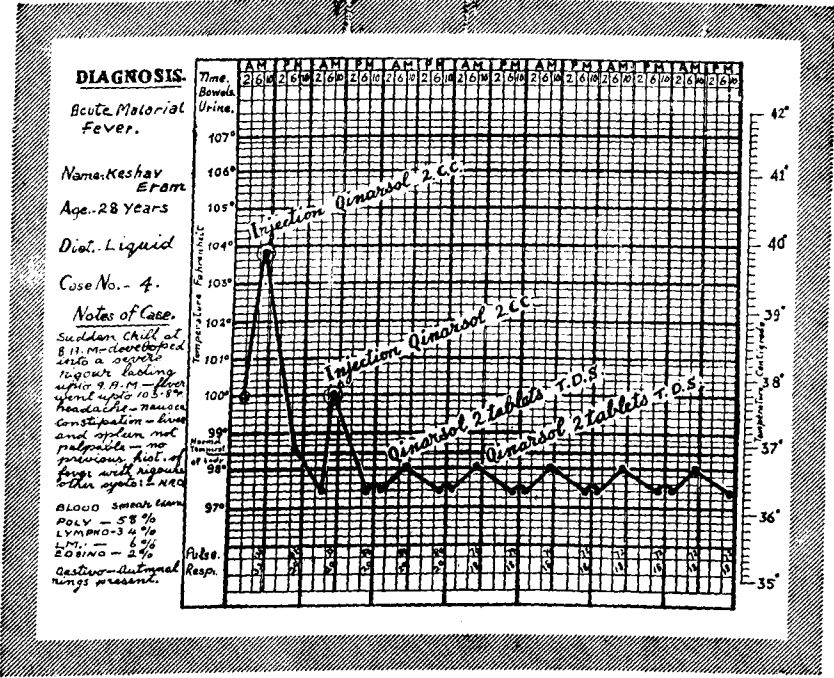


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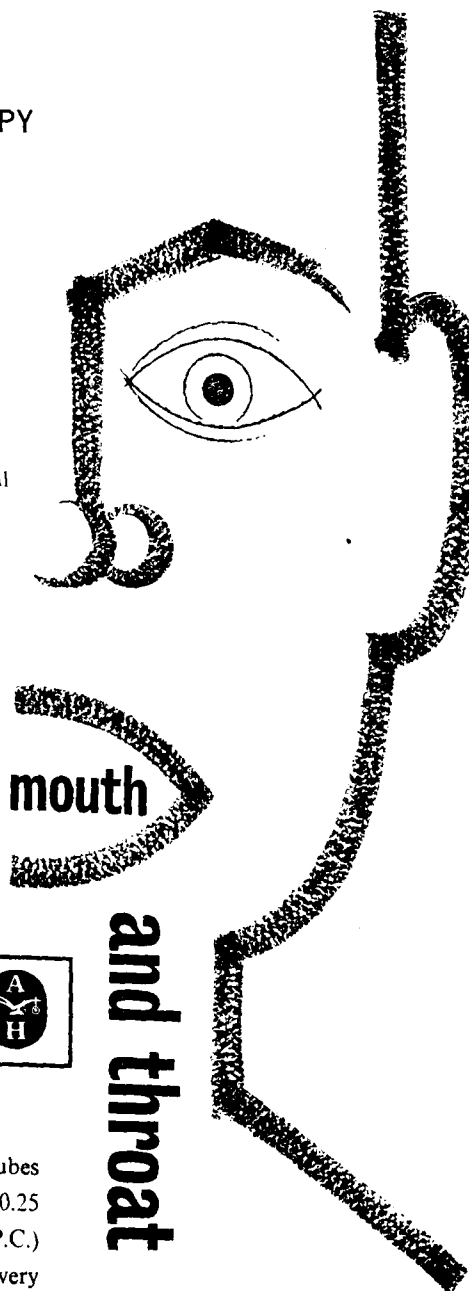
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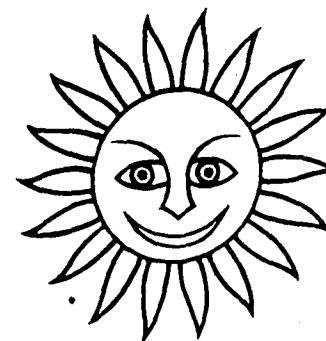
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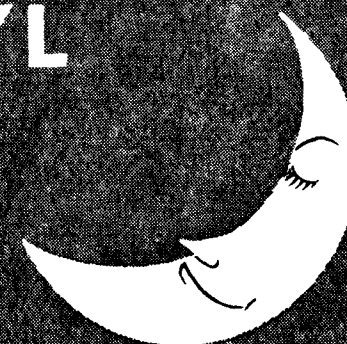
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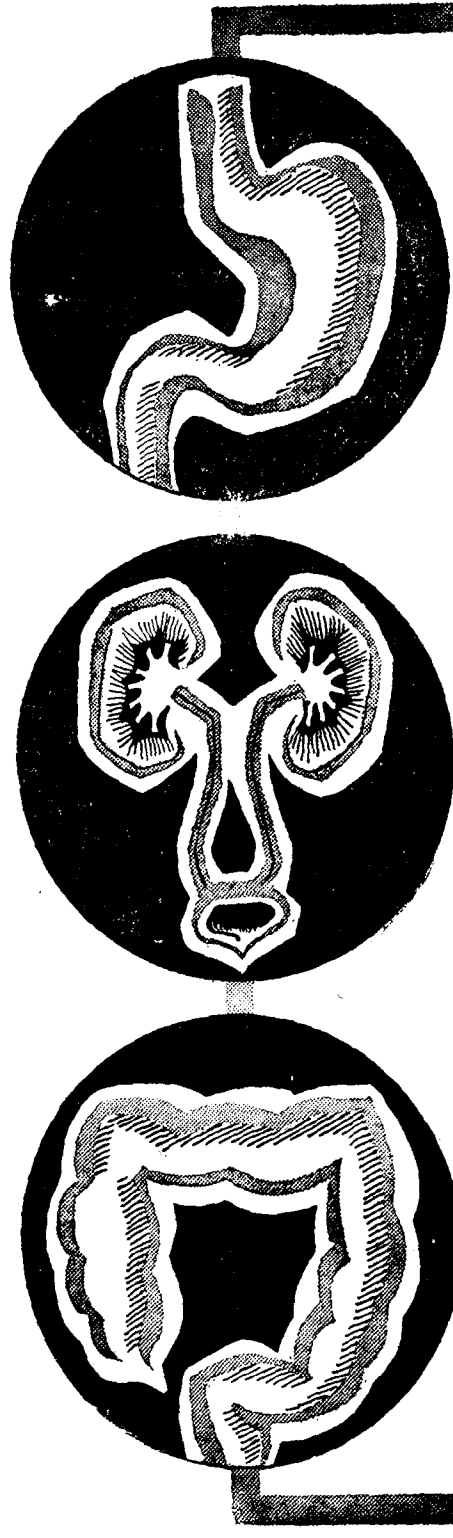
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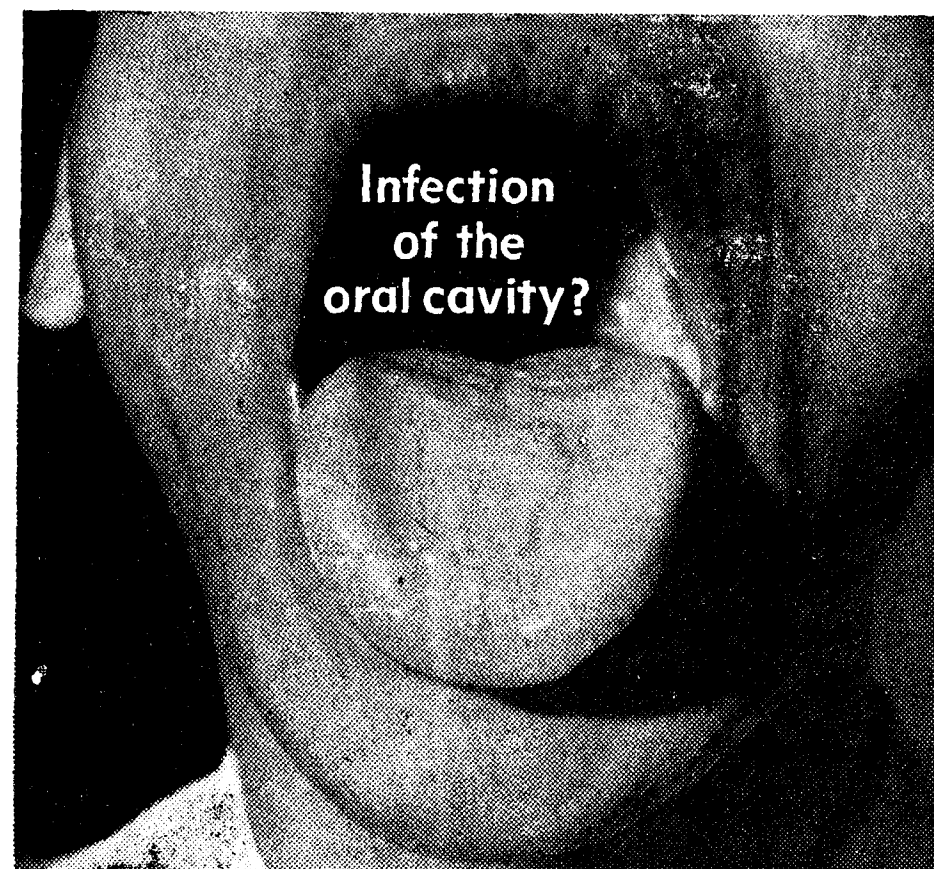
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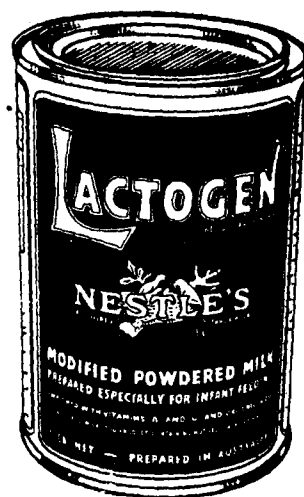
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LITERATURE ON APPLICATION

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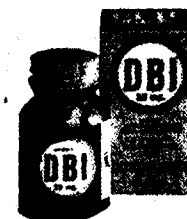
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| VEGANIN | Analgesic sedative antipyretic tablet |
| VERACOLATE | Cholagogue-evacuant tablet |

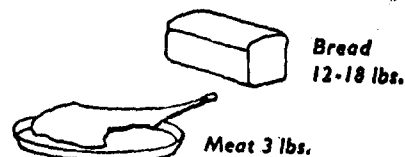
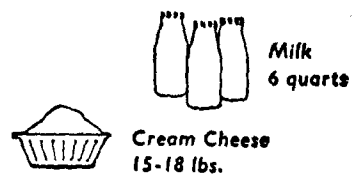
All Warner products perform their tasks
with certainty and precision



Warner-Lambert Pharmaceutical Company, U.S.A.

15 mcg. Vitamin B₁₂ in a daily dose...

(quantities of common dietary articles
containing 15 mcg. of Vitamin B₁₂ are
indicated below)



PLASTULES[®] B₁₂

Wyeth

JOHN WYETH & BROTHER LIMITED, LONDON
(Incorporated in England with Limited Liability)

Indian Branch: Steelcrete House, Dinshaw Wacha Road, Bombay 1

a potent
oral treatment
for all
nutritional
anaemias



plus...

Vitamin B₁₂...the erythrocyte maturation factor...is but one feature in the Plastules B₁₂ formula. It also contains iron, liver, yeast and folic acid. It is designed to provide for complete and continued haemopoiesis in nutritional anaemias, whether "borderline" or severe.



Just
3 Plastules B₁₂
capsules
per day
provide:

Dried Ferrous Sulphate	486 mg.
Dried Yeast	144 mg.
Folic Acid	3 mg.
Vitamin B ₁₂	15 mcg.
Liver Extract derived from 10.2 Gm. fresh liver	

Supplied:

Bottles of 30 and 300 capsules.

* Trade Mark

L. 69.



amazing
achievement
of modern
synthetic
chemistry

DEXA-CORTISYL

The most potent corticosteroid so far
known confers unprecedented
freedom from side effects!

All indications
of Corticotherapy
Vials of 10 tablets



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Particulars and supplies from:
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STADMED

Range of

Whole Liver Extract and Vitamin B-Complex.

For Parenteral use

STADMED
Whole Liver Extract
(Plain)

STADMED
Whole Liver Extract
(Forte)
with Vit. B₁₂ & Folic Acid

STADMED
Whole Liver Extract
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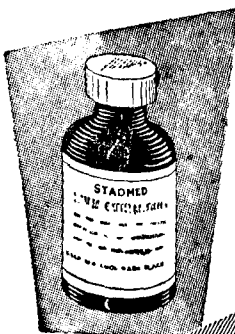
STADMED
Whole Liver Extract
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(Plain)

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Vitamin B-Complex
(Forte)

STADMED
Folic Acid Compound
Reinforced with Liver Extract

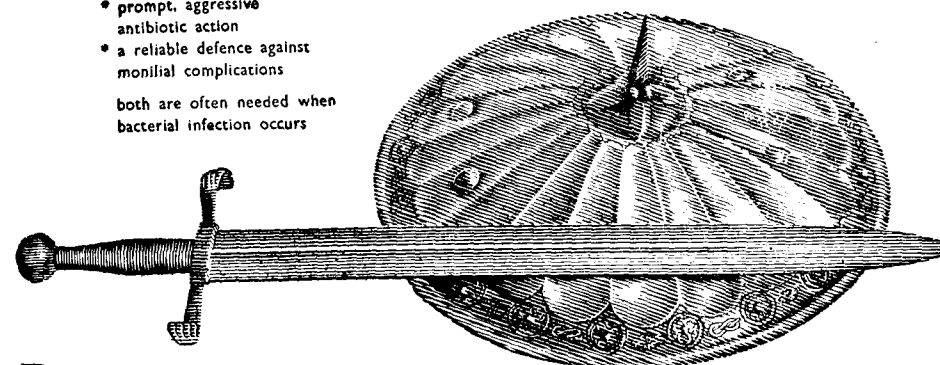
Quick haemopoiesis
Maximum tolerance
Sustained effect.
Satisfies all Criteria
as anti-anaemic.



—Combats deficiency Syndromes
—Regulates metabolism
—Promotes General wellbeing

STADMED PRIVATE LIMITED.
House of Aminozyne
CALCUTTA-4

- prompt, aggressive antibiotic action
 - a reliable defence against monilial complications
- both are often needed when bacterial infection occurs



for a direct strike at infection

Mysteclin-V contains tetracycline-phosphate potentiated

It provides a direct strike at all tetracycline-susceptible organisms (most pathogenic bacteria, certain rickettsias, certain large viruses, and Endamoeba histolytica).

It provides the new chemical form of the world's most widely prescribed broad spectrum antibiotic.

It provides unsurpassed initial blood levels—higher and faster than older forms of tetracycline—for the most rapid transport of the antibiotic to the site of infection.

for protection against monilial complications

Mysteclin-V contains Nystatin

It provides the antifungal antibiotic, first tested and clinically confirmed by Squibb, with specific action against Candida (Monilia) albicans.

It acts to prevent the monilial overgrowth which frequently occurs whenever tetracycline or any other broad spectrum antibiotic is used.

It protects your patient against antibiotic-induced intestinal moniliasis and its complications, including vaginal and anogenital moniliasis, even potentially fatal systemic moniliasis.

MYSTECLIN-V

Squibb Tetracycline Phosphate Potentiated and Nystatin

Capsules (250 mg./250,000 u.), vials of 8 and nested packings of 50 & 100.
Suspension (125 mg./125,000 u. per 5 ml.) 30 ml. bottles.

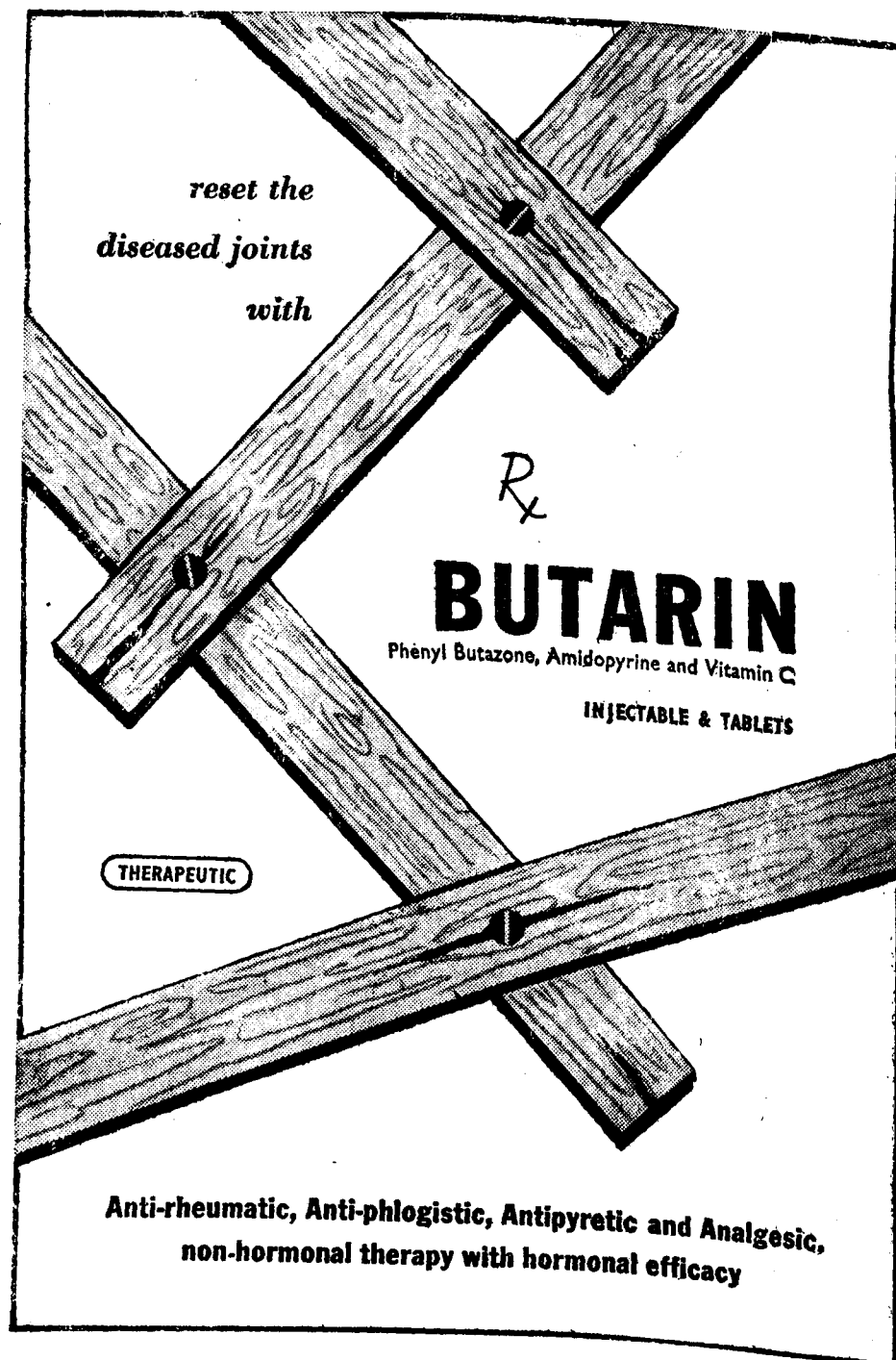
Pediatric Drops: (100 mg./100,000 u. per 1 ml.) 10 ml. dropper bottles.

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MANUFACTURERS OF SQUIBB MEDICALS IN INDIA



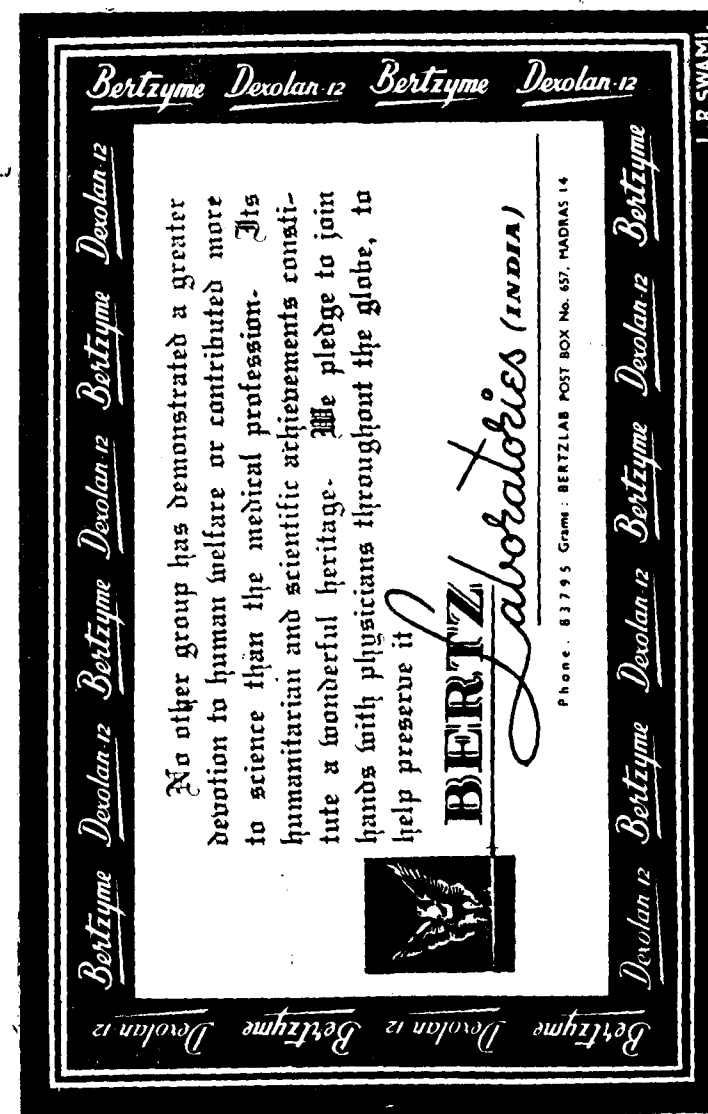
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diseased joints
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Phenyl Butazone, Amidopyrine and Vitamin C
INJECTABLE & TABLETS

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Anti-rheumatic, Anti-phlogistic, Antipyretic and Analgesic,
non-hormonal therapy with hormonal efficacy



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No other group has demonstrated a greater devotion to human welfare or contributed more to science than the medical profession. Its humanitarian and scientific achievements constitute a wonderful heritage. We pledge to join hands with physicians throughout the globe, to help preserve it.

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**NOT TOO
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COLD...**

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—because an oil must be neither
too *thick* when the engine
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You get both these advantages
from Multigrade Shell X-100
Motor Oil. It circulates freely
in the engine, forms a fine
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The right  oil at any operating temperature

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Vitaminised tonic

of
great nutritional
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*For anaemias and
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*For massive
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Pyrgasol**WANDER**

ANTISEPTIC LOZENGES WITH AN ANALGESIC
AGENT FOR PREVENTION AND ACTIVE
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OF MOUTH AND THROAT.

Available in aluminium strips
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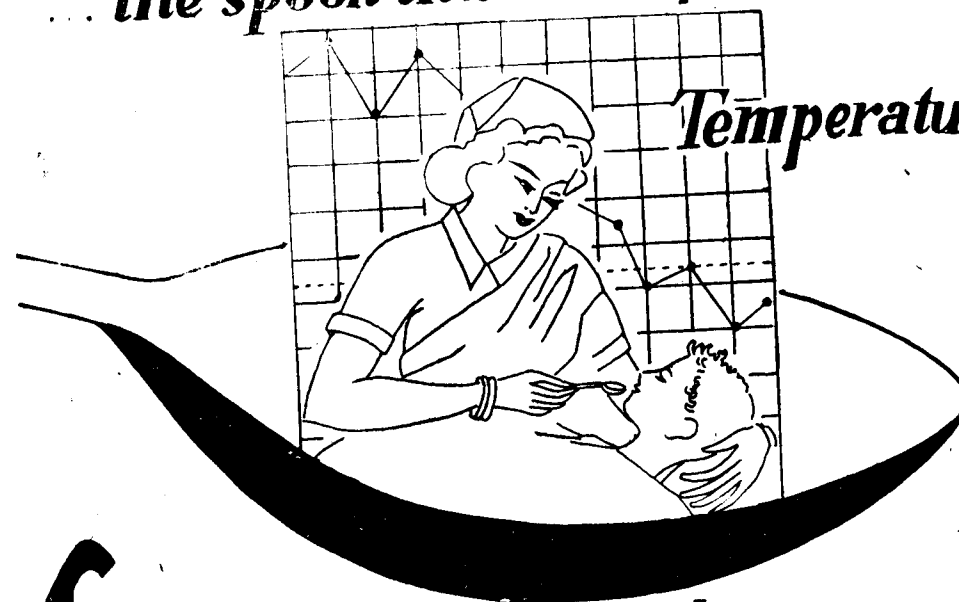
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Temperature.

**Enteromycetin syrup**

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PLAIN AND WITH VIT. B. COMPLEX



Especially for infants and sensitive
patients. Vitamin B-Complex assures
further protection by preventing
possible effects of avitaminosis.

Packing :

Syrup (with Vit. B-Complex) in
60 c.c., and Syrup (plain) in 50 gm.
in Tamperproof bottles with
Plastic Spoon.



Manufactured by

DEY'S MEDICAL STORES (Mfg.) PRIVATE LTD.

CALCUTTA-19

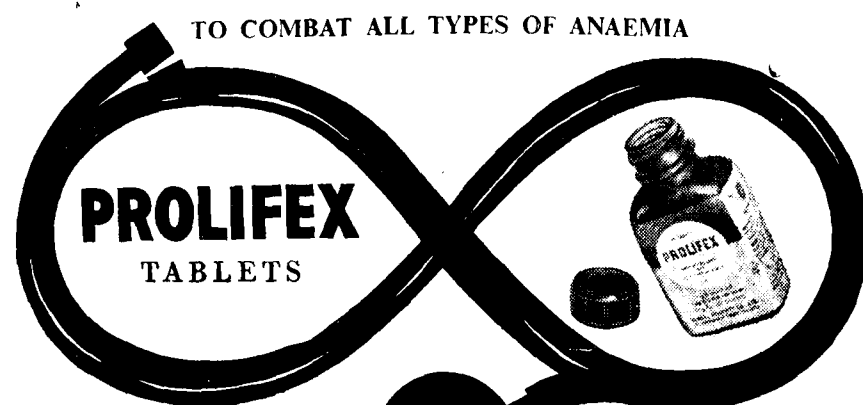
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DEY'S MEDICAL STORES PRIVATE LTD.,

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Proteolysed Whole Liver
Fortified with Vit. B-Complex
Including Folic Acid & Vit. B₁₂,
Vit. C and Iron

BENGAL IMMUNITY CO., LTD.
153, Dharamtala Street, Calcutta-13

In Packs of
50, 100, 500
& 1000 Tablets

Each tablet represents :
Proteolysed Liver powder (equivalent to
2g. fresh liver)

Stomach powder	..	250 mg.
Vitamin B ₁	..	10 mg.
Vitamin B ₂	..	2.5 mg.
Niacinamide	..	1 mg.
Vitamin B ₆	..	10 mg.
Panthenol	..	0.5 mg.
Folic Acid	..	1 mg.
Vitamin B ₁₂	..	1 mg.
Vitamin C	..	2.5 mcg.
Ferrous sulphate (exsiccated)	..	20 mg.
Cobalt nitrate	..	100 mg.

★ For Adequate Calcium cum Vitamin-C Therapy.

CALCIUM-C.B.I.
CALCIUM GLUCONO-GLUTAMATE WITH VITAMIN-C

Ampoules	5 ml.	10 ml.
Calcium Glucono-Glutamate 10%	100 mg.	200 mg.
Vitamin C	250 mg.	500 mg.

In packs of 6, 12 and 50

BENGAL IMMUNITY CO., LTD.

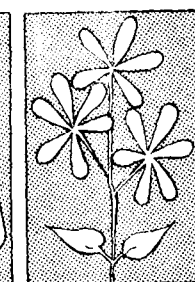
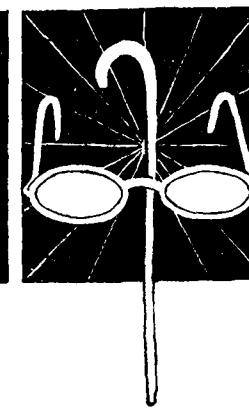
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In climacteric tensions and in premature old age

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you can trust



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IN THE TREATMENT OF

DYSMENORRHOEA—
Congestive and Spasmodic

UTONE

uterine sedative and tonic

Indications:
Dysmenorrhoea spas-
modic and congestive
Metrorrhagia
Chronic endometritis
Habitual abortion
Menopausal disorders

Composition:

Oudumbara fruit (Ficus glome-
rata), Ashwagandha (Withania
Somnifera), Shatavari (Aspara-
gus Racemosus), Ashoka (Saraca
Indica), Anantmoal (Hemides-
mus Indicus), Kathemath (Ama-
ranthus Spinosus), Jesthamadha
(Glycyrrhiza Glabra), Indrajawa
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AYURVEDEEYA ARKASHALA LTD., SATARA.

TESTPHERIN injectable

Indicated in:
SENILE DEAFNESS.
Atherosclerosis.
Rejuvenation.

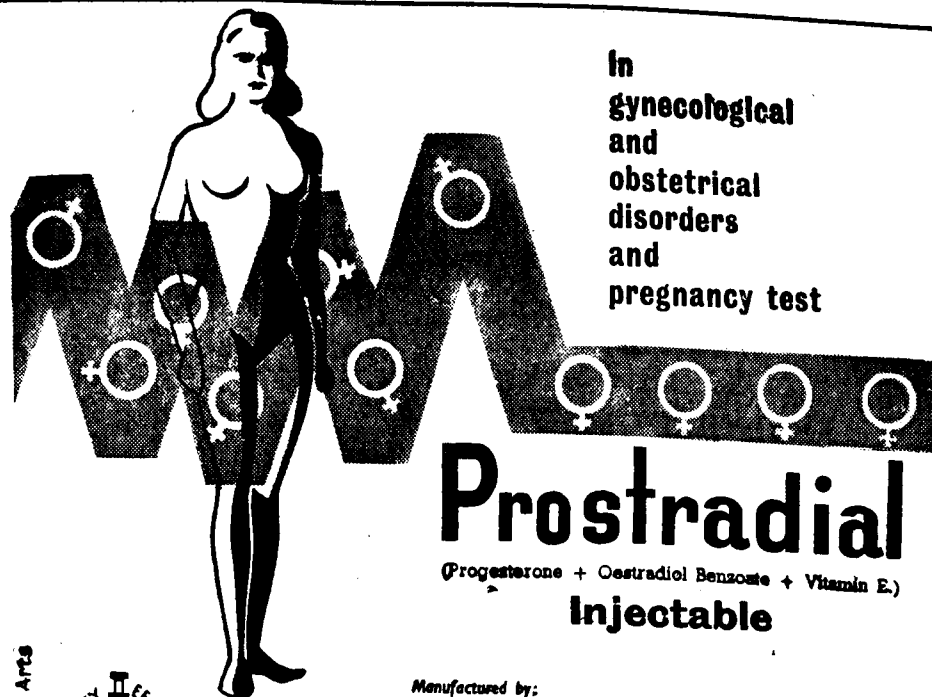
Each ml. contains:
Testosterone Propionate .. 25 mg.
Vitamin 'E' 10 mg.



Manufactured by
M/S UNIQUE PHARMACEUTICAL LABS., BOMBAY-1.
Sole Agents: M/S J. B. Mody & Co., G. P. O. Box No. 609-A, Bombay-1.



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In
gynecological
and
obstetrical
disorders
and
pregnancy test

Prostradial (Progesterone + Oestradiol Benzene + Vitamin E.) Injectable

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UNIQUE PHARMACEUTICAL LABS, BOMBAY 1.
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Chitale Arts



"It is useful to remember how often sulpha drugs will achieve clinical cure as quickly as antibiotics, with less risk and for a fraction of the costs compared with broad-spectrum antibiotics."—R. Heilig, *Ind. Pract.*, July 1958.

"During the twenty years of their use, the sulphonamides have on the whole not been responsible for many side effects: in this respect they are superior to the more recent antibiotics."—G. Domagk, *Clin. Expts.*, 5/1955.

SUPRONAL

(Combination of sulphamerazine and sulphathiocarbamide salt of p-aminomethylbenzenesulphonamide)

A POLYVALENT SULPHONAMIDE WITH BROAD SPECTRUM ANTIBACTERIAL ACTION

- * Powerful action against both aerobes and anaerobes.
- * High therapeutic efficacy in very low doses.
- * No danger of crystalluria.



»Bayer«
LEVERKUSEN, GERMANY

Tubes of 20 tablets of 0.5 g.
Bottles of 250 & 1000 tablets of 0.5 g.



This German physician already used sulphur in his practice. Nowadays sulphur is applied in the form of highly active organic compounds, such as:

Mitigal

for skin diseases

- * Deep skin-penetrating action.
- * Excellent local and general tolerance.
- * Powerful parasitocidal effect.

A SPECIFIC IN SCABIES!

RELIABLE IN ACTION! CLEAN IN APPLICATION!

Mitigal Oil : Bottles of 30 g.
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BR/PW/12

EPCOL COUGH SYRUP

For Prompt and Immediate Relief

COMPOSITION :

EPCOL (Fortified)

Each ounce contains :

Mepyramine Maleate	... 25 mg.
Pot. Antimony Tartarate	... 3 mg.
Codeine Phosphate	... 30 mg.
Ephedrine Hydrochloride	... 30 mg.
Calcium Hypophosphite	... 240 mg.
Pot. Guaiacol Sulphonate	... 240 mg.
Tinc. Ipecac	... 15 mm.
Liquid extract of Wildcherry	
Glycyrrhiza and Vasaka	q.s.
in palatable syrup base	

EPCOL

Each ounce contains :

Pot. Antimony Tartarate	... 3 mg.
Calcium Hypophosphite	... 240 mg.
Pot. Guaiacol Sulphonate	... 240 mg.
Tinc. Ipecac	... 15 mm.
Liquid extract of Wildcherry,	
Glycyrrhiza and Vasaka	q.s.
in palatable base	

Indications :

Soothes irritations, loosens bronchial secretions, facilitates expectoration, relieves cough, cold, influenza bronchitis, Asthma, Whooping Cough, and Coryza, etc.

THE BRAHMACHARI RESEARCH INSTITUTE,

Gram : 'STIBINOL'

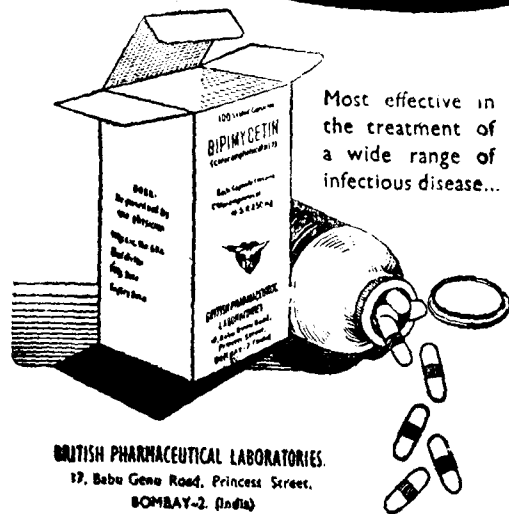
82/3, Cornwallis Street, CALCUTTA-4

Phone : 55-1363



BIPIMYCETIN

CHLORAMPHENICOL



Most effective in the treatment of a wide range of infectious disease...

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- BIPIPYRIN
(Sugar coated tablets)
Phenyl Butazone 0.125 G.
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Tablets & Capsules

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write to :

3 BROS.

For infants

NEO-FERRUM
(INFANTS).
readily miscible with
milk and easily
incorporated in the feed.



NEO-FERRUM

Iron for all ages

When oral iron is contra-indicated or when it is necessary to raise the haemoglobin level rapidly, NEO-FERRUM INTRAVENOUS should be used.

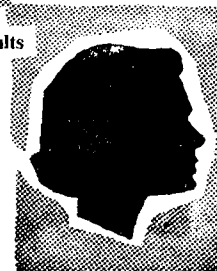
For adolescents

taste is an important
factor. NEO-FERRUM
TABLETS AND
LIQUID are exceptionally
pleasant to take.



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who are often deterred from
persevering with iron
medication because of
gastric disturbances and
staining of the teeth,
NEO-FERRUM is quite
free from these risks.



Infants— 4 oz. bottles; Liquid—4 oz. bottles
Tablets— 50's and 250's;
Intravenous— Boxes 6 x 5 ml. amps. and
50 x 5 ml. amps.



THE CROOKES LABORATORIES LIMITED
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COURT HOUSE, CARNAC ROAD, BOMBAY-2

When a Specially Compounded Vit. B-complex
̄ Rutin is Required for your Diabetic or
Hypertensive Patient

B

NAVARATNA

Elx-B-Rutin

Contains all the important members of the Vitamin
B-complex and specially solubilised Rutin to ensure
quicker absorption. Free from alcohol and sugar.

NAVARATNA
PHARMACEUTICAL LABORATORIES,
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P.A.S. has been proved to be of immense therapeutic value in the treatment of Tuberculosis as a compulsory adjuvant to Streptomycin

PAMICYL

Is our Brand of P.A.S. available as Sodium and Calcium salts and also as

PAMIZID

With Isonicotinic acid Hydrazide and Vitamins and lately as

ANAZID

Isoniazid salt of P.A.S. acid chemically combined.
Effective even in resistant cases in doses of 600 mgm. per day.

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G. D. A. CHEMICALS LTD.,

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Grams: 'SULFACYL'

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ELIXIR

A novel combination of well established Therapeutics for the Specific Treatment of Tropical Eosinophilia

Advantages:—1. Immediate relief and spectacular improvement in all the distressing symptoms (Cough, Wheeze and the typical Rhinitis etc.) associated with Tropical Eosinophilia.

2. Free from Toxicity.
3. Palatable and Elegant.

Each 30 c.c. (1 fl. oz. approx.) contains:

Diethyl carbamazine citrate B.P.	... 400 mg.
Glyceryl Gualacolate	... 250 mg.
$\alpha\alpha$ Diphenyl-oxy- β Dimethylamino-acetate hydrochloride (Diphenin)	... 4.0 mg.

PHYTOSYNTH LABORATORIES,

Post Box No. 65,

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COCHIN - 2

MUL-MIN

A DECAVITAMIN TONIC

for

Correcting Nutritional Deficiency States of Vitamin Origin

COMPOSITION

Each 100 mls. Contains

Vitamin B ₁ B.P.	75 mg.	Nicotinic Acid Amide B.P.	350 mg.
Riboflavin B.P.	15 mg.	Calcium Pantothenate U.S.P.	35 mg.
Vitamin B ₆ B.P.C.	7 mg.	Inositol N.F.	175 mg.
Vitamin B ₁₂ B.P.	50 mcg.	Vitamin A	17500 I.U.
Folic Acid B.P.	10 mg.	Vitamin D ₂ B.P.	3500 I.U.

INDICATIONS

Beri-beri, pellagra, cheilosis, glossitis, photophobia, rickets, febrile conditions due to low resistance to infection, anaemias associated with the deficiency of the B complex Vitamins. A valuable aid in pregnancy, lactation and during convalescence after sickness.

ASSOCIATED DRUG CO. Private LTD., YERCAUD.

Introducing

BITAPHENICOL CAPSULES

(Chloramphenicol, Brand of BOMBAY TABLETS)

Each capsule contains:

Chloramphenicol, B.P. ... 250 mg.

INDICATIONS:

Typhoid; Para Typhoid A & B; Whooping Cough; Meningitis; Pre- & Post-operatively; etc.

Samples & descriptive literature available on request.

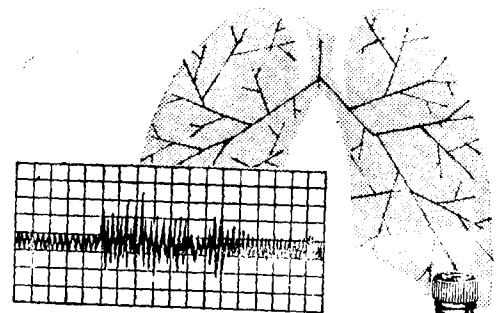
Available in packings of 12, 100 & 500 Capsules.

BOMBAY TABLET MANUFACTURING CO.,

Post Box 2092,



BOMBAY-2



COMPOSITION

Potassium Iodide	700 mg (10.5 grs)
Aminophylline	360 mg (6.0 ..)
Nicotinic Acid	120 mg (1.8 ..)
Calcium Hypophosphite	800 mg (12 ..)
Caffeine Alkaloid	60 mg (.9 ..)
Potassium Guaiacol Sulphonate	1000 mg (15.4 ..)
Ephedrine Hydrochloride	120 mg (1.8 ..)
Tincture Belladonna	1.9 c.c. (30 minims)
Aromatic Vehicle	ad. 30 c.c.

adults/59

in asthmatic
and bronchial troubles

ASMOLIN
with aminophylline



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FOR CORTICOSTEROID THERAPY

EMBOSSED TABLETS
of 5 mg. each

BOTTLES OF 15, 50, 100, 250,
500 and 1,000
TABLETS

AND NOW:

FOR RELAXATION
OF MUSCLE SPASM
AND ARTHRITIS

MEPROSOLONE INDON

EACH TABLET CONTAINS:

PREDNISOLONE 2 mg., MEPROBAMATE 0.2 g., MAGNESIUM
TRISILICATE 0.15 g. BOTTLES OF 20, 100, 500 TABLETS



MANUFACTURED BY

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PHARMACEUTICAL WORKS PRIVATE LTD.
KOHINOOR ROAD BOMBAY 14

PREMENSTRUAL TENSION

"Treatment with a progestogen is almost invariably successful. In mild cases relief is usually obtained by oral administration of ethisterone in a dosage of 25 mg. twice daily during the second half of the menstrual cycle."

Brit. Med. J. 1953 (May) i,1007

A larger proportion of patients can be relieved by the intra-muscular injection of progestosterone, 25 mg. on alternate days during the same phase of the cycle.

Prescribe

PROGESTIN B.D.H.
5 mg., 10 mg. and 25 mg. ampoules or

LUTOFORM TABLETS
(ETHISTERONE B.D.H.)
5 mg. and 10 mg. tablets
(for oral or sublingual use)

BRITISH DRUG HOUSES (INDIA) PRIVATE LIMITED
P.O. Box 1341, BOMBAY-1
Branches at: Calcutta, Delhi, Madras

Smile away that **ANAEMIA** with
BIRON D_C LIVER

"FORTE"

A rational therapy for anaemias
of any etiology



Each 30 ml. contains

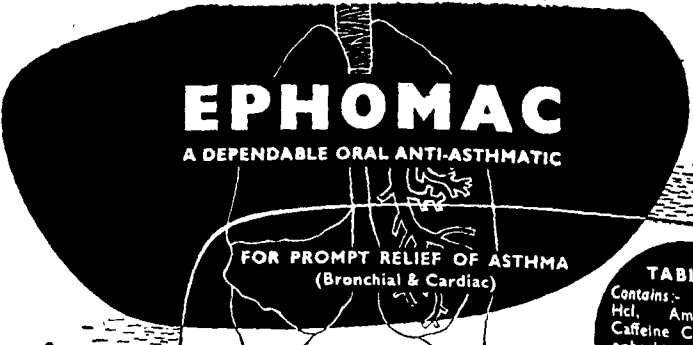
Proteolysed Liver Extract derived from 15 G. of fresh liver having Vitamin B₁₂ activity equivalent to 3 mcg. of Cyanocobalamin.
Proteolysed Stomach Extract derived from 5 G. of raw Stomach.

Thiamine Mononitrate U.S.P.	10 mg.
Riboflavin B.P.	2 mg.
Vitamin D ₂ B.P.	2000 I.U.
Folic Acid U.S.P.	2 mg.
Niacinamide B.P.	50 mg.
Calcium Hypophosphite B.P.C.	1 G.
Ferrous Gluconate B.P.	0.5 G.

Traces of Copper, Manganese and Cobalt
Flavoured Syrup



PROF. GAJJAR'S STANDARD CHEMICAL WORKS LTD.,
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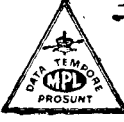


EPHOMAC
A DEPENDABLE ORAL ANTI-ASTHMATIC

FOR PROMPT RELIEF OF ASTHMA
(Bronchial & Cardiac)

ELIXIR
Contains: Ephedrine Hcl, Aminophylline, Sod. Iodide, Sod. Benzoas, Caffeine Citras, Sod. Arsenate, Belladonna, Lobelia, Adatoda, Glycyrrhiza, Senega, etc.

TABLETS
Contains: Ephedrine Hcl, Aminophylline, Caffeine Citras, Phenobarbitone, Sod. Arsenate, Belladonna & Calcium Gluconate.



MacMargarets Pharma - Lab.
40, SANTHOMÉ HIGH ROAD, MADRAS-28.

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OPIL

B COMPLEX

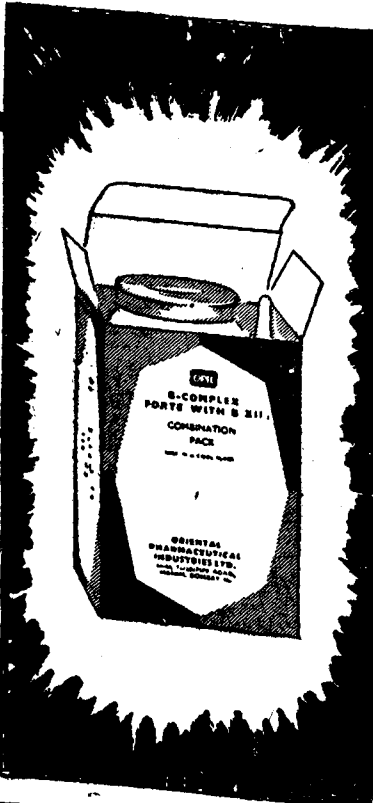
FORTE WITH B XII
COMBINATION PACK

Each ml. of the mixed solution Contains:

*Vitamin B ₁₂ B.P.	75 mcg.	Choline Chloride	25 mg.
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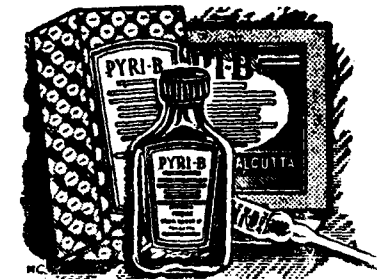
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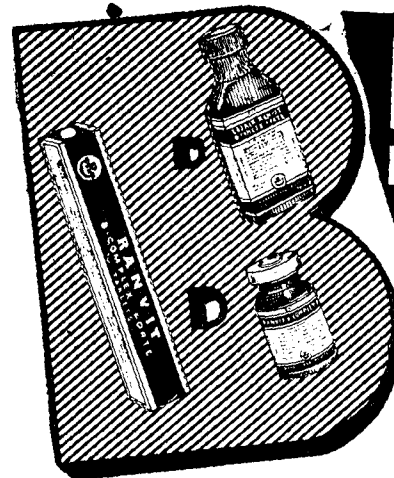
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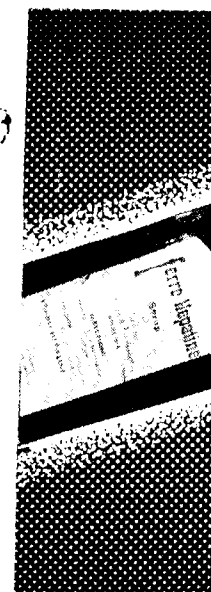
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Original Articles

SURGICAL TREATMENT OF BRONCHIECTASIS AND CYSTIC DISEASE OF THE LUNG*

BRONCHIECTASIS is a chronic disability producing dilated bronchi of the third and fourth order, giving rise to recurrent attacks of pneumonitis and bronchorrhœa. This condition was till now considered incurable; and only palliation was possible. With the recent advances in the segmental anatomy of the lung, anæsthesia, improved methods of resuscitation and bronchography, the outlook has greatly improved and most cases of bronchiectasis and cystic diseases can be cured by surgery. Bronchiectasis damages the bronchi so irreparably that once established the condition remains chronic and irreversible and nothing short of surgery can cure it.

M. J. KHAN, M.S. (Madras),

Thoracic Surgeon, King George Hospital,

Additional Professor of Surgery,

Andhra Medical College, Visakhapatnam

These patients suffer from persistent cough with expectoration and recurrent attacks of pneumonitis. Life is rendered more miserable by the fetor in some patients, which unfits them for mixing in society. Some cannot get married and a few having gross psychological disturbances have even committed suicide. They do not ordinarily live to the full span and death usually results from an attack of respiratory tract infection.

Perry and King¹ in their follow-up of 260 cases of untreated bronchiectasis found that 32% of the patients were dead in 12 years from the date of observation. The morbidity is also great, 35% being unable to work and 40% being fit only for part-time work.

*Specially contributed to the ANTISEPTIC.

Cystic disease of the lung is often congenital in origin. Bronchiectasis on the other hand, may be congenital or acquired. But weakness of the bronchial wall, infection and obstruction to the bronchi are features common to both. An young girl developed symptoms of bronchiectasis following inhalation of a small marble into her left bronchus. Six months later, when examined by us, she was found to have bronchiectasis of the left lower lobe. In children, tuberculous affection of the hilar nodes resulting in gross enlargement can press on the bronchi and cause obstruction with consequent bronchiectasis. This is fairly common in the case of the middle lobe because of the anatomical location of a group of hilar nodes in relation to the middle-lobe bronchus. Hence it is important that tuberculous adenitis of the hilum should be treated early and adequately. Some even excise some of these enlarged hilar nodes that press on the bronchi as a prophylactic measure against bronchiectasis.

Another very important aetiological factor is childhood pneumonia. Necrotizing pneumonia of childhood is followed by organization around the bronchi with subsequent peribronchial scarring. The scar tissue around the bronchi produces traction from many points on the circumference of the bronchi, the walls of which are already damaged, dilated and weakened by the same infective process. It is essential therefore, that infection of the lung especially in childhood, should be properly and adequately treated. If left untreated, bronchiectasis may get worse and may extend even to the adjacent healthy bronchi. If however, localized bronchiectasis is promptly excised, there is no danger of subsequent spread.

A lung affected by cystic disease or bronchiectasis cannot efficiently do the work of desaturation of the blood since most of the time the alveoli and the bronchi are filled with secretions. It has been found that very little blood flows through the diseased portions of a lung and blood is actually diverted to the healthy portion for desaturation. Thus, bronchiectatic or cystic lung tissue is practically a space-occupying lesion, almost useless for respiration and is even a circulatory burden on the left heart. Excision of the diseased portion of the lung therefore, will actually improve the pulmonary functions, as also the general condition of the patient by removing the chronic source of infection.

Investigations.—Two important investigations need to be done *namely*, bronchoscopy and bronchography. For several days before bronchography, the patient is put on postural drainage, so that at the time of the bronchography he will be quite dry. Both the investigations are done at one sitting under local anaesthesia. Bronchoscopy helps in detecting endo-bronchial lesions; like tumours or foreign bodies. After broncho-

scopic examination a rubber catheter is introduced into the trachea. Under screening, Dionosil (oily) 20 cc. is injected into the bronchial tree through the catheter adjusting the position of the patient in such a way that every segment is filled on both sides. Particular care should be taken in filling the normal lobes because if the entire lung on one side is affected one should be 100% sure that the opposite side is healthy before attempting surgery. Postero-anterior view and left anterior-oblique and right anterior-oblique view X-ray pictures are taken. The LAO picture shows the right bronchial and the RAO, the left bronchial tree. Thus it may be seen that both sides are visualized at one sitting.

Case reports.—CASE I:—Mrs. B.Y., aged 27, was admitted in the Thoracic Surgical Unit for cough and expectoration of more than ten years' duration. She was prone to get recurrent attacks of cold and fever and was bringing out about 15 ounces of foul-

smelling, sputum every day. She was treated elsewhere as a case of pulmonary tuberculosis with Streptomycin, without any improvement. She was a fairly well-built woman with no chest deformity or clubbing of fingers. Crepitations were heard over the right upper lobe region. Sputum was repeatedly negative for tubercle bacilli. A skiagram of the chest was normal. Bronchoscopy was normal, but bronchography revealed cystic bronchiectasis of the right upper and middle lobes. The right lower lobe and left lung were normal.



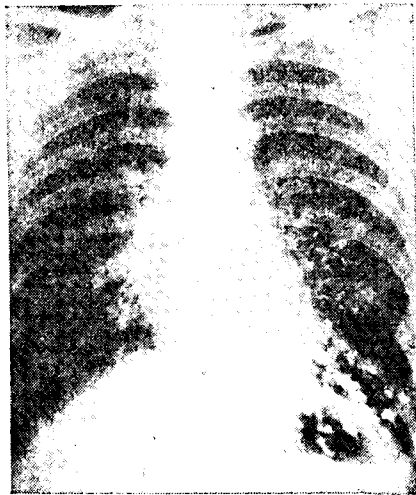
CASE I, B.Y.—FIG. 1. Bronchogram P.A. view showing cystic bronchiectasis of the right upper and middle lobes.

On 20-12-'59 with the patient in the prone position, the right chest was opened through the bed of the excised sixth rib.

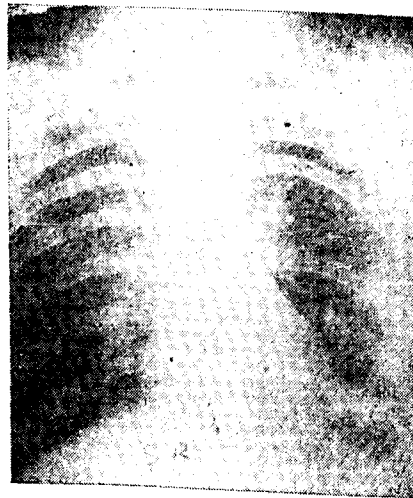
Inspection and palpation of the lung revealed the upper and middle lobes to be involved in bronchiectasis. There were a few large cystic bullae on the surface of the lung. The affected lobes were contracted and were actually pushed down considerably and the healthy lower lobe was occupying most of the right chest. The diseased lobes were excised by individual ligation of the hilar structures and the bronchus was closed with interrupted cotton sutures. The chest was closed with two drainage tubes. The patient did well post-operatively and was discharged

three weeks later. Histopathological examination of the excised lobes showed cystic bronchiectasis.

CASE II:—Mr. S.R., aged 24 was admitted for severe hæmoptysis of eight hours' duration. He had had two attacks of hæmoptysis last year but the present attack was the worst. He had also cough with expectoration for over 15 years. The patient on admission was pale with a blood-pressure of 92/60 and a pulse rate of 130 per minute. He was given a transfusion of 800 cc. of blood. Plain X-ray of the chest did not show any



CASE II, S. R.—FIG. 1. Bronchogram P. A. view showing cystic bronchiectasis of the left lower lobe.

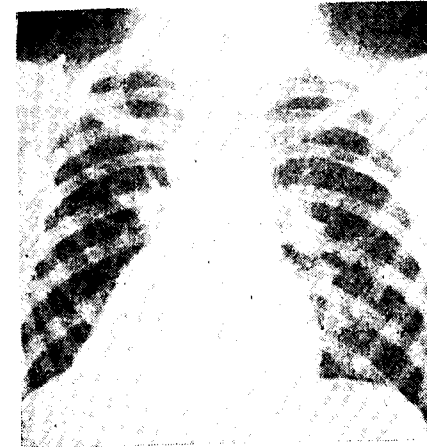


CASE II, S. R.—FIG. 2. Post-operative skiagram taken a month after the left lower lobectomy showing the well expanded left upper lobe.

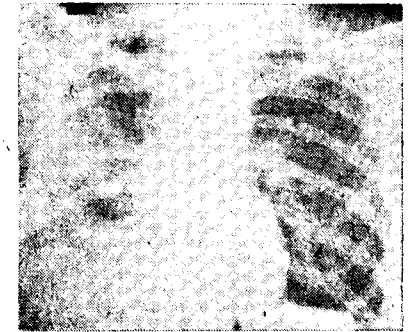
lesion in the lung. Bronchoscopy done three weeks after the admission was normal, but bronchography showed bronchiectasis of the left lower lobe. The left upper lobe and the right lung were normal. The patient underwent a left lower lobectomy and the post-operative period was uneventful. Histopathological examination of the resected specimen showed bronchiectasis. It is now nine months since the operation was done and the patient is doing well. He has no cough or expectoration, or hæmoptysis and has increased 12 lbs. in weight.

CASE III:—Miss S. J. M., aged 11, was admitted in the thoracic unit for cough with expectoration of 6 years' duration and irregular fever for 2 months. The girl was poorly developed physically and her growth was stunted for her actual age. She had no clubbing of the nails but had rales heard over the right base. Skiagram of the chest showed atelectasis of the right lower and middle lobes. Bronchoscopy was normal, but bronchography showed cystic disease of the right lower and middle

lobes. The right upper lobe and left lung were normal. The patient had a right lower and middle lobectomy. These lobes



CASE III, S. J. M.—FIG. 1. Skiagram of the chest showing atelectasis of the right lower and middle lobes.



CASE III, S. J. M.—FIG. 2. Post-operative skiagram of the chest showing the well expanded remaining right upper lobe.

were found to be completely atelectatic. The patient did well post-operatively. Histopathological examination of the excised specimen, showed extensive bronchiectasis of both the lobes. This patient is doing well now, two years after the operation.

CASE IV:—Mr. P. Y., aged 25, was admitted in the thoracic surgical service for easy fatigability and inability to walk more than a couple of furlongs without getting out of breath. He had

cough with expectoration of about 7 years' duration and complained of palpitation on slight exertion. Recurrent attacks of fever had reduced his weight considerably and he was looking pale and wasted. The chest was shrunk and practically was not moving with respiration. Coarse rales were heard all over the left chest. Skiagram of the chest showed the left lung to be full of cysts. The left bronchus as seen through a bronchoscope was found to be very small in diameter. Bronchography

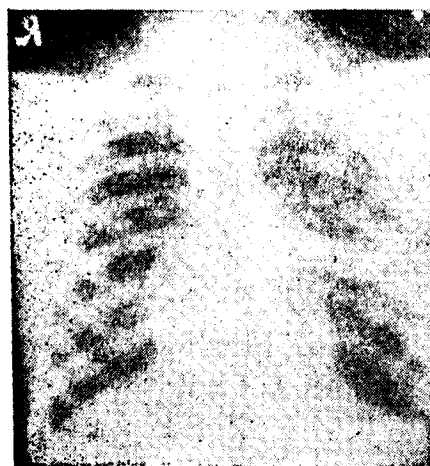


CASE IV, P. Y.—FIG. 1. Skiagram of the chest showing cystic disease of the entire left lung.

revealed the right lung to be completely free. The patient underwent a left pneumonectomy. On the table the left lung was found to be very poorly developed and was just one third

the normal size when fully inflated. He had an uneventful post-operative recovery. The patient is doing well now, more than a year and a half after the resection.

CASE V:—A.B., a seven-year-old boy, was admitted in the thoracic surgery unit for cough, with expectoration and recurrent



CASE V, A. B.—FIG. 1. Skiagram of the chest P. A. view showing a giant cyst replacing the entire left lower lobe.



CASE V, A. B.—FIG. 2. Skiagram, Left lateral view showing the giant cyst.



CASE V, A. B.—FIG. 3. Resected specimen of the giant cyst.

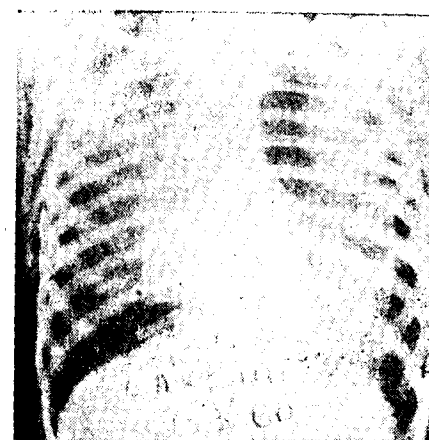
attacks of fever of three years' duration. He had suffered several minor attacks of hæmoptysis. He could walk only for two to three furlongs, beyond which he would get out of breath. The boy was anæmic and very poorly developed. Physical examination revealed hyper-resonance with absent breath sounds over



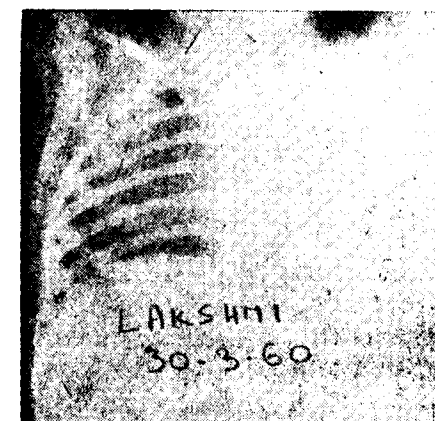
CASE V, A. B.—FIG. 4. Post operative skiagram showing the well expanded left upper lobe.

the left lower lobe region. A giant cavity replacing the entire lower lobe was seen in the skiagram. Bronchography revealed the left upper lobe and right lung to be normal. The patient underwent a left lower lobectomy, with a smooth post-operative period. He is doing well five months after the operation.

CASE VI:—L.M., a girl of five years, was admitted in the thoracic surgery unit during the month of March 1960, for fever, dyspnoea and subcutaneous emphysema of two days' duration extending from head to toe. The girl on admission had a temperature of 102°F. and her entire body was bloated up due to the subcutaneous emphysema. There was no history of injury. Physical examination of the chest could not be done properly due to the subcutaneous emphysema. Skiagram of the chest showed pneumothorax on the left side with partial collapse of



CASE VI, L. M.—FIG. 1. Skiagram chest P. A. view showing extensive subcutaneous emphysema and pneumothorax of the left chest.



CASE VI, L. M.—FIG. 2. Skiagram chest P. A. view taken during the attack of fever; 48 hours after this skiagram was taken the patient suddenly became dyspnoic and died.

the lung; the right side was normal. A urethral catheter was put into the left chest anteriorly in the second interspace and connected to an under-water seal. A skiagram taken 48 hours later showed the left lung to be well expanded but full of multiple cysts. Another 48 hours later, the tube was pulled out. Gradually the subcutaneous emphysema cleared up and in ten days' time she was quite free from it. Two weeks later she developed fever of 104°F with plenty of rales and crepitations over the left chest. She was put on one of the broad spectrum antibiotics as she was found resistant to the usual ones. Two days later one evening she suddenly became acutely dyspnoic and expired shortly after. In this case probably one of the cysts may have burst and produced severe tension pneumo-

thorax, which precipitated her death. The other possibility is that plenty of secretions from the affected left lung may have spilled over into the only healthy right lung and virtually drowned her in the secretions; the first of the two explanations, is more probable in this case. Post-mortem examination could not be done. Evidently the extensive subcutaneous emphysema she had at the time of admission must be due to a bursting of one of the cysts in her left lung.

Discussion.—Six selected cases with different types of histories and symptoms have been presented. The first patient was mainly troubled by the large quantity of foul-smelling sputum and cough; the second was admitted during a severe attack of hæmoptysis; the third had, besides the usual signs and symptoms recurrent attacks of fever and stunted growth; the fourth had dyspnoea and palpitation on walking a short distance; the fifth, a small boy had recurrent attacks of blood-spitting and the last, a small girl was admitted with extensive subcutaneous emphysema and pneumothorax. The patients thus had bronchiectasis, cystic disease and solitary giant cyst. Though the ætiology of these is still not settled, from the surgeons' point of view the treatment for all of them is the same *i.e.*, excision of the diseased portions wherever it is feasible leaving behind enough healthy portions of the lung.

Radiologically it is not possible to exclude bronchiectasis from the plain skiagram. The skiagram of Case No. 2 was normal but the bronchogram showed the presence of disease in the left lower lobe. Bronchiectasis cannot be excluded unless a good bronchogram is done. However, certain signs in the plain chest film, as linear radioluscencies, multiple small cavities, fibrosis, atelectasis of the lung with the resultant cardiac and mediastinal shift, honey-comb appearance, irregularities of the diaphragm, irregular nodular densities etc. should arouse suspicion. Bronchography not only gives the diagnosis but also localizes the disease.

TREATMENT:—As has been stated, bronchiectasis in a few instances might be due to pneumonia, hilar adenopathy, especially due to tuberculosis, pertussis and their adequate treatment should prevent bronchiectasis in such cases. Foreign bodies in the tracheo-bronchial tree should be promptly removed.

Conservative management of bronchiectasis is reserved only for the aged patient with emphysema, or where the disease is very extensive and also when there is any associated cardiovascular disease. The most important factor in the success of the medical management is postural drainage. If this is done correctly and adequately, the massive secretions get drained, and the infection in the bronchi is reduced. The patient should

lie in the appropriate posture of bronchial drainage atleast twice a day and each time for about half hour. Percussion of the chest with the patient in the appropriate posture also helps in dislodging the thick sputum. Antibiotics are needed whenever they get pneumonitis and for this a sputum culture is made and the most sensitive antibiotic is administered. Sensitivity to antibiotics is altered from time to time and hence the sensitivity test may have to be repeated at frequent intervals. The general nutrition of the patient is kept up with a high protein and high vitamin diet. Expectorants like potassium iodide or ammonium chloride help in liquefying the secretions. The patients should avoid smoking and dusty atmosphere and choose a dry climate.

If a patient has bronchiectasis and brings out more than two ounces of sputum a day, it is sufficient indication for operative treatment. Localized bronchiectasis or cystic disease can be cured by excisional surgery in a good number of instances. Quite often bronchiectasis is segmental in distribution and as such only the affected segments should be excised preserving all the healthy ones. Nearly half the patients have the disease on both sides and in these cases segmental excision, where it is feasible with preservation of enough healthy lung tissues on either side is indicated.

Summary.—(1) Bronchiectasis and cystic disease of the lung are chronic disabilities which can be cured in many instances where the disease is localized. Untreated patients do not live a full span of life. (2) Prompt and adequate treatment of childhood pneumonias, pertussis, hilar adenopathy especially due to tuberculosis and foreign bodies in the tracheobronchial tree can prevent the development of bronchiectasis in an appreciable number of cases. (3) The symptomatology of bronchiectasis can be very diverse, and if the condition is borne in mind, diagnosis is easy. (4) A plain skiagram of the chest cannot exclude bronchiectasis. Only a good bronchogram delineating all the bronchi can give the diagnosis and localize the disease. (5) It is now admitted that surgery can cure bronchiectasis where the disease is localized. (6) Reports of six cases are given with different histories and symptomatology, which were surgically treated with success.

REFERENCE:

1. Perry, K. M. A., and King, D. S. (1940)—Bronchiectasis. A study of prognosis based on a follow-up of 400 patients, *Am. Rev. Tuberc.*, 12: 531.

PULMONARY HYALINE MEMBRANES OF PREMATURE INFANTS

Keuth state that pulmonary hyaline membranes are caused by increased arterial CO₂ tension. Disturbances of vascular permeability cause extravasation from the pulmonary capillaries and, in a similar way, from the liver, kidneys, brain, and skin. Excess of oxygen alone is not the cause of hyaline membranes, but atelectasis and damage to the respiratory centre, which causes hypoventilation, also appear to play a decisive role. Normalization of ventilation by re-expansion of atelectatic areas, resuscitation, continuous stimulation, and administration of oxygen are prerequisites for prophylaxis and treatment. Prednisone and acetazolamide have also been used.—(*Ztschr. Kinderh.*, 82: 139, via *J.A.M.A.*, 23rd April, 1960).

IRON THERAPY IN CHRONICALLY FATIGUED, NONANÆMIC WOMEN: A DOUBLE-BLIND STUDY

In the present investigation Beutler *et al* have attempted to determine whether the chronic fatigue, headaches, paresthesias and dyspnoea from which nonanæmic, otherwise healthy women frequently suffer may be due to iron deficiency, by determining whether such patients will actually respond to iron therapy. Because of the great subjectivity of the complaints of patients studied, greatest care was taken in designing the study and in interpreting the results to eliminate bias.

All patients studied were female out-patients of the University of Chicago Clinics, or were University of Chicago students. Each patient who volunteered to participate in the study did so with the full knowledge that she was participating in an experimental evaluation of therapy.

In the present study, iron and placebo were given to a group of women who complained of chronic fatigue but whose blood hæmoglobin levels were above 12.0 g.%. Each woman received one period of iron therapy and one period of placebo therapy; the order of presentation of iron and placebo was varied at random. Comparative improvement in the two periods of therapy was correlated with independently determined measures of the body iron stores, viz., bone marrow stainable iron and plasma iron and iron-binding capacity. Hæmoglobin determinations were carried out at intervals. Although the hæmoglobin values of the patients were all within the normal range at the beginning of the study, an increase in the average hæmoglobin level occurred in the iron-deficient group when they were given iron. Apparently, although the hæmoglobin value of these patients was within the normal range, it was frequently below their individual norm. No significant change in the average hæmoglobin level occurred in the group of patients with adequate iron stores, or in the iron-deficient group, during placebo administration. Of 18 iron-depleted patients, 13 manifested more symptomatic improvement with iron therapy than with placebo therapy, while five improved more with placebo therapy than with iron therapy. In contrast, of 11 women with only slightly reduced iron stores or normal iron stores, four improved more with iron, five manifested more improvement with placebo, and two did not improve at all. In view of these results, the possibility that nonanæmic women may benefit clinically from iron therapy deserves further study.—(*Ann. Internal Med.*, Feb. 1960).

BLOOD SPECIMENS FOR PROTHROMBIN ESTIMATION

The blood specimen necessary for prothrombin estimation will depend upon the technique used. For Quick's one-stage technique most people today use citrated blood as opposed to exsulated blood. Whole blood should be collected, preferably in a siliconized syringe, and mixed with 3.13% sodium citrate in the proportion of nine parts of blood to one part sodium citrate.

It is best that the estimation of the prothrombin time, especially if Quick's method is used, should be done as quickly as possible after the blood is taken; due to the activation through contact with glass, shortening in the clotting times will occur if the blood specimen is allowed to stand for several hours. For this reason also some people prefer to take the citrated blood specimen in plastic containers instead of glass to avoid this activation factor.—(*The Practitioner*, March 1960).

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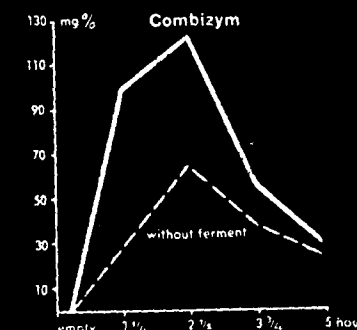
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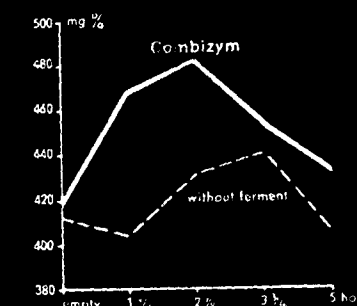
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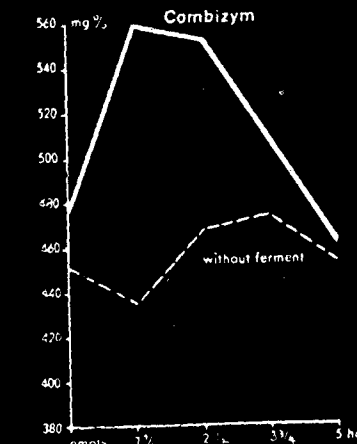
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ANTIBIOTICS FROM HIGHER PLANTS*

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INTRODUCTION :—Antibiotics are popularly believed to be products of metabolism of micro-organisms, since those now in clinical use belong to this group. Strictly speaking, any distinction between active substances formed by micro-organisms which belong to lower plant life and those elaborated by the higher plants is at best academic, and so their source is immaterial from the purely therapeutic point of view. Before the advent of microbial antibiotics higher plants were used, although empirically, for therapeutic purposes all over the world. It is therefore, surprising that no systematic scientific survey of plant antibiotics was undertaken until very recently. The purpose of this article is to describe briefly the salient features of the recent developments.

Antibiotics generally exert a specific inhibitory effect on the growth of the parasitic organisms (bacteriostatic, fungistatic, etc.) and thus are to be distinguished from several other naturally occurring products which either possess low activity or, are non-specific and act as general cytoplasmic poisons just like any antiseptic. When isolated in a pure state, an antibiotic should for all practical purposes completely inhibit the growth of a test organism at a dilution of at least 1 in 200,000. Their inhibitory properties may be assessed either by *in vitro* or *in vivo* tests.

Quinine may be regarded as the first well-defined antibiotic substance from plants to be used therapeutically. However, by the application of modern microbiological techniques of assay and screening methods alongside chemical methods of characterization, a wide variety of higher plants have now been investigated by numerous workers, notable among them being Osborn¹, Huddleson², Lucas and Lewis³, Sanders⁴, Cavallito and co-workers⁵, Atkinson and Rainsford⁶, Seegal and Holden⁷, Heatly⁸, Pederson and Fischer⁹, Henry Tsuchiya *et al*¹⁰, Southam¹¹, Bissell and Mueller¹², Okazaki *et al*¹³, Hayes¹⁴, Masilungen *et al*¹⁵, Ferenczy and Graczy¹⁶, Hasegawa *et al*¹⁷, Gallo and Valeri¹⁸, Yang Chang and Weng¹⁹, Maruzzella and Lichtenstein²⁰, Jasper, Maruzzella and Freudenlich²², Kurup²³, and by George and Pandalai²¹ in our laboratories. More than three thousand plants mostly angiosperms belonging to a hundred families have thus been screened so far. It may be stated that roughly about 20% of these extracts showed definite antibacterial activity against gram-positive or gram-negative organisms or both. It might be considerably higher since the crude

* Specially contributed to the ANTISEPTIC.

extracts contained many growth-promoting substances which would partially mask the antibiotic effects. The higher plants commonly contain several potent substances antagonistic to gram-positive organisms and to a lesser extent the gram-negative bacteria and mycobacteria. They occur often throughout the plant but are generally confined to one part alone. Constituents of plants belonging to the same family tend to show similar specific action and potency. Some of the well-known drug plants including *Atropa*, *Datura*, *Digitalis* and several others also widely used in the indigenous systems of medicine exhibit no detectable *in vitro* action. In addition to these general observations, it may be mentioned that plants belonging to several families of *Cruciferae*, *Liliaceae*, *Compositae*, *Ranunculaceae*, *Aristolochiaceae*, *Caprifoliaceae*, *Rutaceae*, *Solanaceae*, *Guttiferae* and a few others have provided a number of pure compounds with very pronounced antibacterial properties in our *in vitro* tests, some examples of which are given in Table I (see page 190 to 192).

Kinship of plant and microbial antibiotics.—Plant antibiotics belong to diverse chemical types but bear no resemblance to those of microbial origin now used in clinical practice. Nevertheless, several members are closely related chemically to other microbial antibiotics. Plants, like, *Gullipia officinalis* (Angustura bark) which were in vogue in the treatment of bacterial infections elaborate substances e.g., 2-amyl-o-methoxy-quinoline" allied to the Pyo-group of compounds viz., 2-substituted quinolinols formed by *Psuedomonas aeruginosa*" which are effective *in vivo*. A more common example is the formation of the helminthosporin by *Helminthosporium* Spp., closely related to the anthraquinone compounds, chrysophanic acid, emodin, etc., isolated from plants of the genus *Cassia*. It is quite possible, therefore, that the therapeutic properties ascribed to such plants could be readily correlated to the occurrence of these specific constituents, but further systematic pharmacological and *in vivo* experiments with pure substances could alone place them on a rational therapeutic basis.

Screening for antibiotics.—The purpose of screening is to ascertain whether a plant or a part of it contains in sufficient quantities any soluble constituent highly inhibitory to the growth of micro-organisms as a prelude to their isolation. For this purpose, aqueous, alcoholic, and ether or chloroformic extracts of a known quantity of fresh or air-dried whole plant or roots, bark, leaves, flowers or any other part of the plant, are assayed by serial dilution technique or by any variation of diffusion-assay procedure adopted in the determination of penicillin. The antibiotic activity of such extracts are determined using *Micrococcus pyogenus* var. *aureus* (*Staphylococcus aureus*), *Esche-*

cherichia coli (*Bacillus coli*), *Mycobacterium smegmatis* or *phlei*, *candida albicans* or any other representative member of the gram-positive, gram-negative groups and mycobacteria and fungi. The activity of the extracts is expressed in terms of dilution units or in millimetres of the zone of inhibition, and from the data thus provided, plants are selected for further studies with a view to isolating and characterizing the active constituents. It must be recognized, however, that the above assay procedures are only suggestive and at best the activity indicated is proportional to the product of the several active constituents present and their intrinsic specific activities. Thus a substance of low activity, if present in large quantities would lead to a misleading conclusion, while a highly potent substance occurring in minute quantities may be missed altogether. Nevertheless, these procedures have proved to be of practical value, but the limitations, unfortunately often overlooked in practice, must be kept in mind in forming definite conclusions about the therapeutic value of plant materials. The second consideration in the interpretation of the results relates to the fact that frequently the antibiotic principles may not be present in the free condition but may be liberated or formed from bound or precursor materials by enzymic action. Disregard of this aspect in practical work has led to several misconceptions in the past and it is therefore, desirable and necessary to assay fresh plant materials before and after incubation in suitable buffers. The majority of workers until now have not however, been alive to these issues. What holds good in this connection seems to apply also to other aspects of many pharmacological and chemical investigations on plants carried out in the past.

Isolation of antibiotics.—A variety of crystalline plant constituents have been and are being isolated by chemists, often without any previous reference to their biological properties and the pharmacological results are recorded only later. This procedure is unsatisfactory in the context of assessing the therapeutic value of a plant in view of the instability and sensitiveness of biologically active constituents. At the present time, the isolation of these active constituents is carried out by biochemical techniques under mild conditions using bioassays at every stage of manipulation, recalling the analogous procedures employed in connexion with microbial antibiotics. The case of pterygospermin from the roots of *Moringa pterygosperma* may be cited as an example."

Plant antibiotics and their distribution.—Chemically, they belong to varied groups and are widely distributed in different families. From the available literature the following generalizations may usefully be made:—(1) Higher plants contain constituents of low potency towards *Micrococcus pyogenes* var. *aureus*

and in the majority of cases the effect may be attributed to the presence of chlorophyll. (2) Constituents active on gram-positive organisms are more abundantly distributed and may belong to any chemical group. (3) Constituents with wide antibiotic spectrum are to be found in the families of Cruciferae, Morinaceae, Caparidaceae and even Passiflora. These are generally organic isothiocyanates* which contain the active radical— $N=C=S$. Sulphur-containing active substances are also present in many species of the family of Liliaceae. These are liberated from glucosides or other precursors by appropriate enzymic action. (4) In many of the germinating legume seedlings at any rate the components that exert high fungistatic activity are known to belong to the benzoxazole group. (5) A variety of quinones, viz., benzoquinones, naphthaquinones and anthroquinones which are widely distributed, account for the anti-staphylococcal activity of many plants. (6) Essential oils and other volatile constituents in general do not contain substances that can be classified as antibiotics.

Biological properties.—Many of the plant antibiotics have not been adequately studied for their pharmacological and therapeutic properties probably due to their scarcity or instability or out of commercial considerations. Examples given below are intended to focus interest in the investigation of readily available plant materials as sources for therapeutic purposes.

I. ANTIBIOTICS ACTIVE AGAINST GRAM-POSITIVE ORGANISMS
MORELLIN AND GUTTIFERANS (α , β , γ , and δ).—*Morellin*, an orange yellow crystalline substance, is a cheap plant antibiotic that could be readily isolated in about 20% yield from the sifted powder present in the seed coat of *Garcinia morella* (Guttiferae) commonly called the Mysore Gamboge tree. This plant is common in the rain belt area of the Mysore and Madras States and the material can be procured in commercial quantities. The tree offers a fine example for the distribution throughout the plant of antibiotic principles which, in this case are made up mostly of several closely related constituents designated as α , β , γ , and δ -guttiferins.

Investigations in our laboratory on their methods of isolation, chemical characterization, pharmacological and therapeutic properties have indicated that *Morellin* is a drug of choice when a high concentration of the antibiotic is desired at any locus of infection for a prolonged period. It has been successfully used

* From more than fifty different plants belonging to the four natural orders mentioned and a few also of Liliaceae that have been studied, in addition to various simple isothiocyanates like allyl, isobutyl, benzyl, p-hydroxybenzyl isothiocyanates, methylsulphinyl and sulphonyl substituted alkyl isothiocyanates like iberin, sulphoraphene, sulphoraphane, allysin, arabin, camelinin and hirsutin (sulphinyl group)⁸⁰, cheirolin and erysolin (sulphone group)⁸² have been isolated. Many of these types of compounds are found to be highly active⁷⁹ and are present as glucosides which are decomposed by the action of myrosin-like enzymes.

in the treatment of suppurative wounds, ulcers, boils and burns in humans and also in veterinary practice, for bovine mastitis. Some of its biological properties are shown in Table II, see page 792. For parenteral use on the other hand, the water-soluble guttiferin compounds are efficacious. These may eventually be used on penicillin-resistant organisms.

Pharmaceutical preparations of *Morellin*:—Ointments and jellies containing 0.1 to 1% *Morellin* (in a petroleum or lanolin base) and 1 to 2% olive or arachis oil solutions are employed for topical applications and subcutaneous injections respectively. Dressings are made only once and subsequent applications are rarely found necessary since the drug remains at the locus for over a week.

Tincture *Garcinia* is a cheap and effective preparation containing mostly a mixture of Guttiferins and a small quantity of *Morellin*. This has proved in practice more than a good substitute for Tincture Benzoin for topical applications since it possesses the requisite adhesive properties in addition to exerting powerful antibacterial effects.

II. AN ANTIBIOTIC ACTIVE AGAINST GRAM-NEGATIVE ORGANISMS: ALLICIN⁵⁵⁻⁷ is not present in the free form in the garlic cloves but produced by interaction of alliin and the enzyme, allinase occurring in different cells which come together on crushing. The use of garlic as a household remedy is well known and the establishment of its therapeutic properties provides the scientific rationale for its application. It possesses a wide antibiotic spectrum and also serves to illustrate the formation of highly unstable and chemically sensitive antibiotics in plants. In view of these considerations it is sometimes difficult to obtain products for parenteral use from such plants. Nevertheless, it has been demonstrated that carefully dried and powdered garlic cloves can be incorporated into many pharmaceutical preparations for oral treatment of enteric and other infections. These cheap materials are worthy of greater application in a tropical country like ours.

III. ANTITUBERCULAR ANTIBIOTICS.—Several antitubercular compounds have been demonstrated to be present in plants and a few have been isolated in a pure state. Some of the compounds are citriodorol⁶⁰, sesamin and asarinin⁵¹⁻⁵⁵, eudesmin⁵⁹, casimiroin^{55a}, karanjin³⁸, carpaine⁵⁶, fulvoplumierin^{57,58}, cepharanthine^{61,62}, and curcumin⁶⁵. Allicin referred to above possesses marked *in vitro* antitubercular activity and clinical claims regarding its efficacy are yet to be established. Cepharanthine is an alkaloid isolated from *Stephania cepharantha* and *S. sasakii*, successfully used by Japanese workers for combating various forms of tuberculosis and leprosy in their country^{61,62}.

TABLE I

List of compounds whose antibacterial activity has been studied in detail

SOURCE	COMPOUND	ACTIVITY	REFERENCE
<i>Liliaceae</i> : <i>Allium sativum</i> (bulbs)	Diallyl thiosulphinate or Diallyl disulphide oxide	Against Gram-positive and Gram-negative organisms and mycobacteria.	25,26,27
<i>Ranunculaceae</i> : <i>Anemone pulsatilla</i>	Protoanemonin	Inhibits <i>S. aureus</i> , <i>E. coli</i> , <i>Candida albicans</i> , <i>C. krusei</i> , <i>Cryptococcus hominis</i> , <i>M. tuberculosis</i> .	28,29,30
<i>Compositae</i> : <i>Arctium minus</i>	Compound C ₁₅ H ₂₀ O ₅ and Compound C ₁₈ H ₂₄ O ₆	Active against Gram-positive organisms.	31,32
<i>Crepis tarazacifolia</i>	Crepin, C ₁₄ H ₁₆ O ⁴	Active against Gram-positive organisms. Toxic.	33,34
<i>Centaurea maculosa</i>	Compound C ₂₀ H ₂₆ O ₇	Particularly active against Gram-negative organisms.	35
<i>Xanthium pennsylvanicum</i>	Xanthatin, C ₁₄ H ₁₆ O ³	Effective <i>in vitro</i> against Gram-positive bacteria and fungi. Inactive against Gram-negative bacteria.	36
<i>Leguminosae</i> : <i>Cassia reticulata</i>	Cassic acid (4,5-dihydroxyanthraquinone-2-carboxylic acid)	Very low activity on Gram-positive and Gram-negative organisms.	37
<i>Pongamia glabra</i>	Karanjin	Active against <i>M. tuberculosis</i> .	38
<i>Guttiferae</i> : <i>Garcinia morella</i>	Morellin α , β , γ and δ Guttiferins	Highly active against Gram-positive organisms.	39
<i>Flacourtiaceae</i> : <i>Hydnocarpus wightiana</i>	Chaulmoogra oil and acids	Active against <i>Mycobacterium leprae</i> .	40
<i>Umbelliferae</i> : <i>Hydrocotyl asiatica</i>	Asiaticoside	Do.	40
<i>Aristolochiaceae</i> : <i>Asarum canadense</i> (Wild ginger)	Compound C ₂₁ H ₂₀ O ₈ N ₂ S and Compound C ₁₆ H ₁₁ O ₇ N	Active only against Gram-positive organisms.	41
<i>Moraceae</i> : <i>Humulus lupulus</i> (Commercial hops)	Lupulon and Humulon	Highly active against Gram-positive organisms and mycobacteria. Humulon is less active. Possesses antibiotic activity.	42
<i>Chlorophora excelsa</i>	Chlorophorin		43
<i>Gramineae</i> : <i>Triticum vulgare</i> (Wheat flour)	Purothionin	Active against Gram-positive organisms. Inactive against Gram-negative organisms and filamentous fungi. Not active <i>in vivo</i> .	44,45
<i>Hordeum vulgare</i> (Malt)	Parascorbic acid	Low activity against <i>S. aureus</i> and <i>E. coli</i> .	46
<i>Solanaceae</i> : <i>Lycopersicon pimpinellifolium</i> (Tomato plant) leaves	Tomatin	Very active against plant and animal pathogenic fungi. Also inhibits Gram-positive and Gram-negative organisms.	47

TABLE I—(Contd.)

List of compounds whose antibacterial activity has been studied in detail

SOURCE	COMPOUND	ACTIVITY	REFERENCE
<i>Withania somnifera</i> (Ashwagandha) leaves	Compound C ₂₄ H ₃₆ O ⁶	Active against Gram-positive organisms Ranicut virus.	81
<i>Moringaceae</i> : <i>Moringa pterygosperma</i>	Pterygospermin	Highly active against Gram-positive and Gram-negative organisms and mycobacteria.	48
<i>Saxifragaceae</i> : <i>Hydrangea</i> (Greenhouse variety)	Compound C ₁₆ H ₁₉ N ₃ O ₃	Antimalarial	49
<i>Cornaceae</i> : <i>Aucuba japonica</i>	Aucubin	Active against Gram-positive bacteria and mycobacteria.	50
<i>Pedaliaceae</i> : <i>Sesamum indicum</i> (Sesame seeds)	Sesamin and Asarinin	Active against <i>M. tuberculosis</i> .	51-55
<i>Rutaceae</i> : <i>Casimiroa edulis</i>	Casmiroin	Do.	55a
<i>Citrus aurantium</i> (Orange peels)	Parascorbic acid	Low activity against <i>S. aureus</i> and <i>E. coli</i> .	46
<i>Passifloreae</i> : <i>Carica papaya</i>	Carpaine	Active against <i>M. tuberculosis</i> .	56a
	Benzyl isothiocyanate	Active against Gram-positive, Gram-negative organisms and fungi.	56b
<i>Apocynaceae</i> : <i>Plumeria acutifolia</i>	Fulvoplumierin	Active against <i>M. tuberculosis</i> .	57,58
<i>Myrtaceae</i> : <i>Eucalyptus</i> Kino gam	Eudesmin	Do.	59
<i>Eucalyptus citriodora</i>	Citriodorol	Active against Gram-positive organisms and <i>M. tuberculosis</i> .	60
<i>Menispermaceae</i> : <i>Stephania cepharantha</i>	Cepharanthine	Active against <i>M. tuberculosis</i> and <i>M. leprae</i> .	61,62
<i>Stephania glabra</i>	Gindarinine, C ₁₇ H ⁹ N(OCH ₃) ⁴	Possesses antibiotic activity.	63
<i>Rosaceae</i> : <i>Pyrus aucuparia</i> (Mountain ash, ripe berries)	Parascorbic acid	Low activity against <i>S. aureus</i> and <i>E. coli</i> .	46
<i>Spiraea aruncus</i> (Goat's beard)	Compound, C ₁₀ H ₁₄ O ⁴	Do	64
<i>Zingiberaceae</i> : <i>Curcuma tinctoria</i>	Curcumin	Active against Gram-positive and Gram-negative organisms <i>Trichophyton gypsum</i> and <i>M. tuberculosis</i> .	65
<i>Zygophyllaceae</i> : <i>Larrea divaricata</i>	Nordihydroguaiaretic acid	Active against Gram-positive and Gram-negative organisms.	66,67,68

TABLE I—(Contd.)

List of compounds whose antibacterial activity has been studied in detail

SOURCE	COMPOUND	ACTIVITY	REFERENCE
<i>Cruciferae:</i> <i>Brassica campestris</i>	β -phenyl-ethyl isothiocyanate	Active against Gram-positive and Gram-negative organisms.	69,70
<i>Brassica nigra</i>	Allyl isothiocyanate	Active against Gram-positive and Gram-negative organisms.	71,72,73
<i>Raphanus sativus</i>	Raphanin	Do.	74,75
<i>Celastraceae:</i> <i>Pristemera indica</i> , <i>P. grahami</i>	Pristemerin	Active against Gram-positive organisms particularly <i>viridans</i> group of <i>Streptococci</i> .	77,78

TABLE II

Biological properties of Morellin and Guttiferin

Antimicrobial activity: Various strains of <i>Streptococci</i> , <i>Staphylococci</i> and <i>B. subtilis</i>	Minimum inhibitory concn. (μ g./ml.)	
	0.1–1.66	
Gram-negative organisms: <i>Escherichia coli</i> , <i>Salmonella typhi</i> etc.	100	
Fungi	No activity	
Toxicity (Acute):	No mortality at levels (mg./kg.)	
	Morellin	Guttiferin
Oral	400	1000
Subcutaneous	400	300
Intravenous	100	100
Clinical and Veterinary uses: Ulcers, septic wounds, boils, burns etc. Pyogenic bovine mastitis infections. Animal nutrient		

The Indian allied species which include *S. glabra*⁶³ are known to contain a mixture of alkaloids, gindarinine, gindarine, and gindaricine, probably similar to cepharanthine and are used in the indigenous system of medicine for combating tuberculosis, dysentery and intestinal disorders. Attempts should therefore, be made to evaluate these important compounds clinically.

Conclusion.—The lower plant life *viz.*, microorganisms, are presumed to elaborate antibiotic agents to combat their naturally occurring antagonists. That higher plants, likewise, seem to possess such capabilities could be convincingly demonstrated. The slow elaboration of pterygospermin and benzyl isothiocyanate by the root practically suppresses the microflora in the rhizosphere of the tree and the presence of morellin and guttiferin in the pericarp of the seed apparently protects it before germination under adverse circumstances. An analogous role for

benzoxazolinone in germinating rye seedlings has been postulated⁷⁶.

The exploitation of antibiotics from microbial life as well as from plant life shares a common philosophy. While the microbial sources have been extensively studied, the vegetable kingdom remains to be investigated adequately. Western commercial interests have not so far evinced any eagerness in this direction for reasons which are not far to seek. With the rich tropical vegetation of infinite variety that is available in our country the promise of a greater choice of drugs and flexibility of clinical treatment should motivate Indian scientists and industrial concerns alike, to study and utilize increasingly drugs of plant origin in the years to come.

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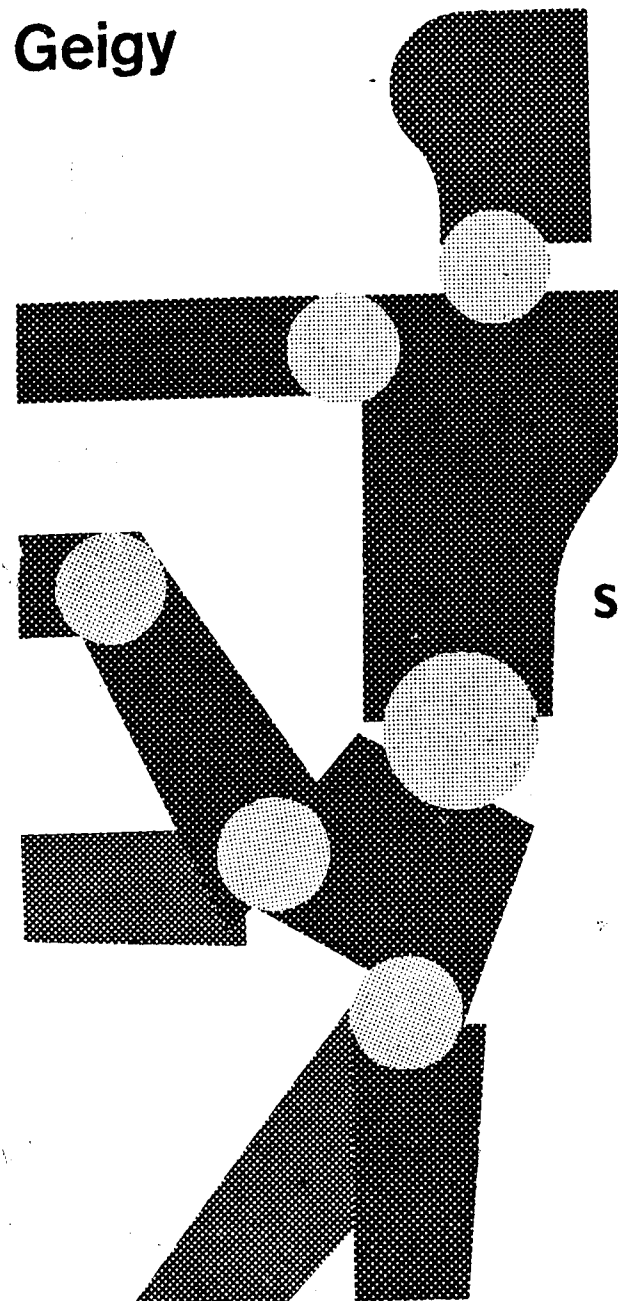
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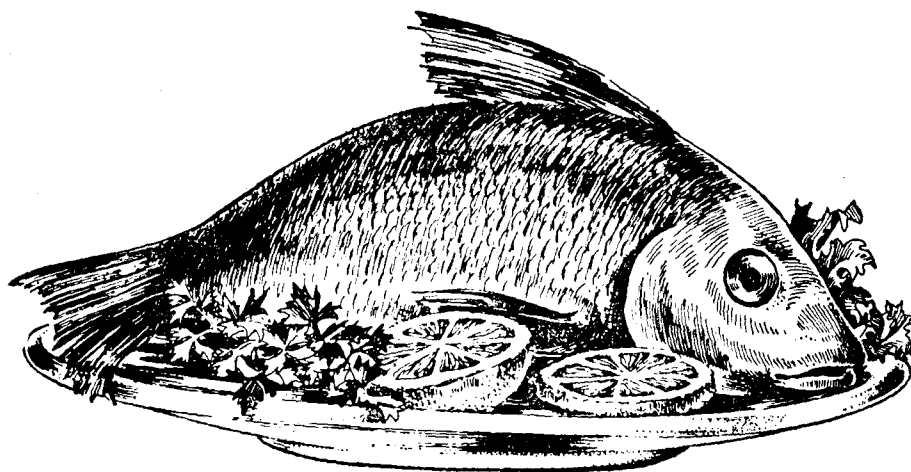
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THE PRICE OF BIOLOGICAL FALSE POSITIVES (B.F.Ps) IN THE PRACTICE OF VENEREOLOGY*

P. N. RANGIAH, M.D.,

Director of the Upgraded Institute of
Venereology, Madras-3

EVER since the introduction of penicillin by Mahoney of the U.S. Public Health Service, for the treatment of syphilis, and this was long after its discovery by the late Sir Alexander Fleming in 1929, its impact on the practice of venereology has not been all to the good. Prior to 1952, this discipline of the medical science was in the hands of medical men who had had specialized training and experience in that branch. But with the growing trends of decentralization, the management of patients suffering from venereal diseases has passed on to the general practitioners and non-specialists also, who use the antibiotic, often even empirically. This is not however, a sound procedure and may even be fraught with disastrous results. Again, as a result of such use of penicillin and the other newer antibiotics, the assay of the incidence of venereal diseases has been seriously affected. Thus, the statistics for the period 1954 to 1959 of the Upgraded Institute of Venereology, show a marked decline in the incidence of the various venereal diseases, especially of syphilis, which is very significant and striking (*vide* Chart 1, below).

Graph showing the number of patients with various Venereal Diseases treated in the institute of venereology during the years 1952 to 1959

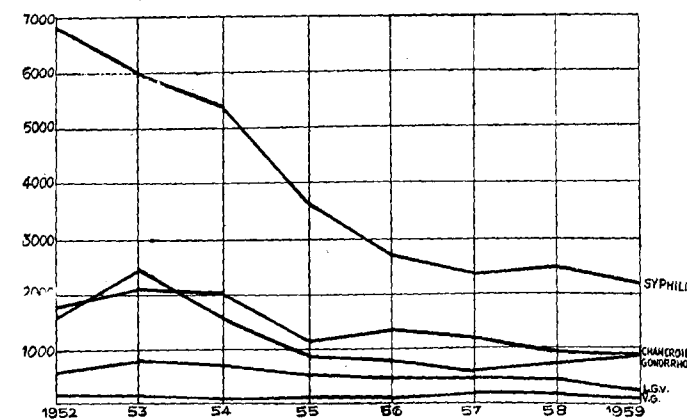


Chart 1

I consider, not without valid reason, that this does not reflect the true state of affairs; for, with the comparatively easy access to and promiscuous use of the antibiotics, the need for accurate diagnosis by competent laboratory techniques has ceased to be felt and the danger of masking other conditions thereby making the diagnosis difficult, has increased. Also, it has not been possible to assess with any degree of accuracy the extent of the prevalence of syphilis in the population

*From a lecture delivered on 22nd May, 1960 at Wellington before the Nilgiri Branch of the Indian Medical Association.

Specially contributed to the ANTISEPTIC.

exposed to risk in the city or in the districts. Unless it is made incumbent by law, on all agencies dealing with venereal diseases, to notify a central authority, their true incidence will remain unascertained and unascertainable.

We have come across alarming reports from the U.S.A. of the gradually increasing prevalence of these diseases among teenagers of both sexes. As will be seen from the histogram (*vide* Chart 2, below) the age-group in our present study, contract-

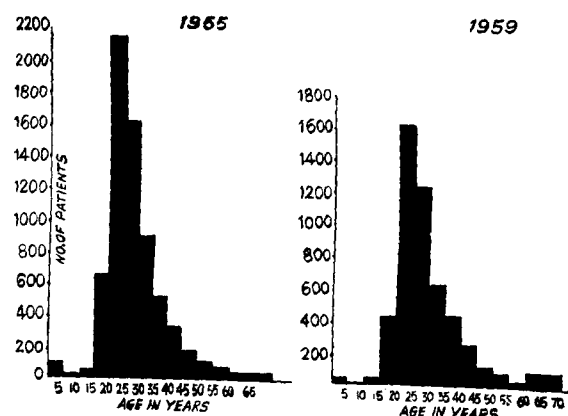


Chart 2

ing venereal diseases would appear to maintain an uniform level for some years. The 20 to 25 age-group among males and 15 to 20 among females provide the maximum number of cases. Human nature being what it is and temptations and attractions being ever on the increase, venereal diseases are bound to be with us for a long time and will require much firmer measures to deal with them and also greater scientific control at all levels. As a result of the new antibiotic atmosphere in the practice of venereology, syphilis is now becoming increasingly difficult of diagnosis.

Prior to 1905, there were numerous difficulties and obstacles in the way of arriving at a correct diagnosis. "The story of the search for the cause of syphilis," according to Sir William Osler, "is a tale to make the judicious grieve." In 1905 Lassar mentioned that 125 causes for syphilis had been postulated during the preceding 25 years. The diagnosis of syphilis was therefore, made by impressions gathered from inspection and palpation and from the observed morphology of the lesions. Personal equations and professional status had thus much to do with diagnosis. There was no room for checks or cross-checks; no wonder then that gross errors did occur. Sir John Hunter was of the view that the same germ was responsible for causing syphilis and gonorrhoea. There also prevailed the wrong notion that syphilis did not affect the bones. Many other fanciful and weird beliefs were also then extant. The French Professor Ricord refuted Hunter's theory of the same agent being the cause for both syphilis and gonorrhoea. He however, postulated that secondary syphilis was not communicable, but was later convinced of his error by a Committee of Medical experts.

The discovery in March 1905 by Hoffmann and Schaudinn of the *Treponema pallidum* gave the quietus to all this controversy about the causal agent and the introduction in May 1906 of the serological test for syphilis by Wassermann based on Bordet and Gengou's basic principle of the occurrence of an antigen-antibody reaction in infective conditions, set the seal on what was till then a matter of heated controversy.

The utilization of the diagnostic Roentgen rays further helped in proper diagnosis, which by now became more or less a laboratory procedure of considerable accuracy and importance to the profession, thanks to the above three handmaids that came to the rescue of the doctor and the patient.

The statistics of the Institute of Venereology for 1954 to 1958 show (*vide* Chart 3, below) that a very large number of dark-ground-illumination tests for T.P. were carried out as a routine measure. Thus, whenever a patient with a genital lesion presented for examination, a dark-ground illumination test on the lesion was made every day for 3 consecutive days or till the dark-field yielded a positive result. It will be seen from the chart that the total number of such examinations has dropped from 14,461 in 1954 to 3,111 in 1958 (in 5-years).

A correlation of these figures with the number of total syphilis admissions during the same period, points to the fact that the positives determined by the dark-ground method alone declined to 20%. This would mean that the other 80% of cases of syphilis had to be labelled as such by the serological tests alone, suggesting that after the advent of the antibiotics, the very pattern of a large proportion of clinical syphilis has shown a tendency to change from the lesional to a non-lesional type or at all events to the dark-field-negative-lesional type.

In the absence of the above laboratory aids during his time. Professor Ricord's classification of syphilis was necessarily based on the four stages of the lesions observed, *e.g.*, primary, secondary, tertiary and quaternary. To these stages has now come to be added another phase *viz.*, that of the latent or hidden type. Latent syphilis manifests no outward abnormal symptoms in the sufferer, nor is anything abnormal with the heart seen in X-ray

Percentage of Syphilis cases diagnosed by serological tests (V.D.R.L.) and D.E. Examination

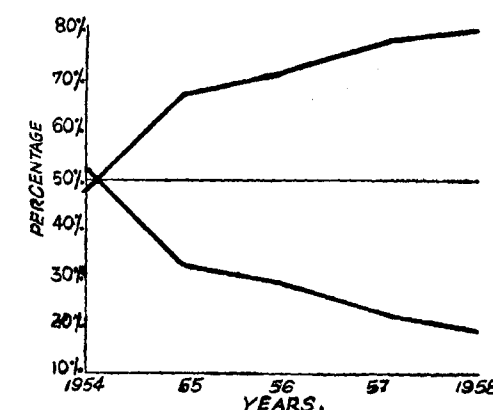
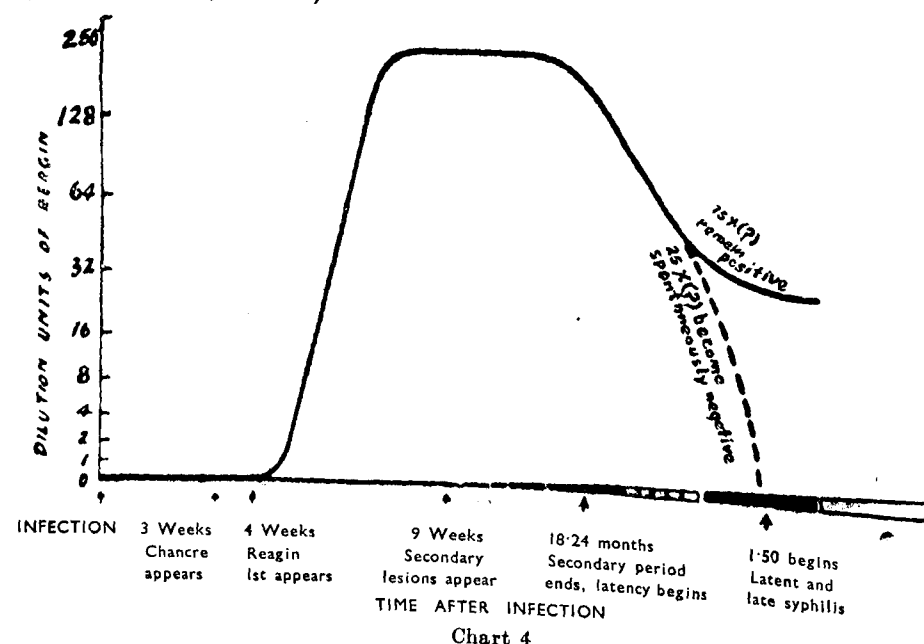


Chart 3

pictures; the C.S.F. is also normal. But the blood in such cases shows a positive reaction to serological tests for syphilis.

Latent syphilis is also episodic in the career of the patient. In untreated cases, when the chancre has subsided, the sera yield a positive serological reaction, even though there are no outward symptoms of syphilis on the body-surface. Again, in untreated cases passing through the secondary phase of the disease, periods of clinical normalcy may be followed by relapses of the secondary stage. Thus the only diagnostic measure is by serological examination. The untreated patient will continue to be a positive reactor till he has reached the tertiary stage, which itself may subside in the sense that visible tertiary lesions may be absent, while the serum alone continues to be reactive (*vide* Chart 4, below).



Nearly all cases of latent or hidden syphilis detected in the early latent phase of less than 4 years' duration, can be successfully treated without letting it pass on to the late irremediable stages.

A person in the latent phase not presenting evidence of any visible lesion on the genitals or other surfaces of the body but showing some abnormal condition in the eyes or in the cardiovascular or central nervous system, is apt to be treated for diseases other than syphilis.

To illustrate, I will refer to the case of an young unmarried cane-worker aged 23, who contracted syphilis in the form of a genital ulcer and took 2 injections outside in one of the free V.D. dispensaries and fancied himself cured, only to report himself to the Government Ophthalmic Hospital five

months later with a severe headache followed by a loss of most of his vision in both eyes.

It so chanced that at this time the V.D. Institute was collaborating with the Madras Government Ophthalmic Hospital in an important piece of research work on the role of syphilis in the causation of ocular diseases and disorders. In the course of the serological tests carried out on all such patients, the blood from this young man reacted positively in 16 dil by the VDRL test. A history of contact infection and the presence of a genital scar were elicited on examination. The C.S.F. however, revealed nothing abnormal. The report from the ophthalmic research side stated:—"the acuity of vision in the right eye is 3/60 NIG; the left eye 4/60 NIG; near vision and accommodation NIG. Fields show concentric contraction in both eyes. The fundus and media reveal hyperæmia of both sides, margins are blurred; and veins engorged. The finding reached was neuro-retinitis of both eyes, the right more affected than the left." In the end a positive diagnosis for syphilis was made and specific treatment given with the standard PAM schedule and oral corticosteroids. He was discharged cured. It is quite likely that in this case the inadequate treatment of the initial infection in the genital sore stage, resulted in a shortening of the long interval that usually elapses between surface syphilis and systemic or organ syphilis.

A follow-up of this case was rendered feasible under a different research plan; the patient was found to be all right and his vision stood at 6/6. The fundus in both eyes as also the fields were all normal.

This case forcibly brings out the value and the need for an emphasis on the serological test, without which this patient would have been doomed to misery and blindness.

Incidence of sero-positive reactors to syphilis in different sections of population in Madras

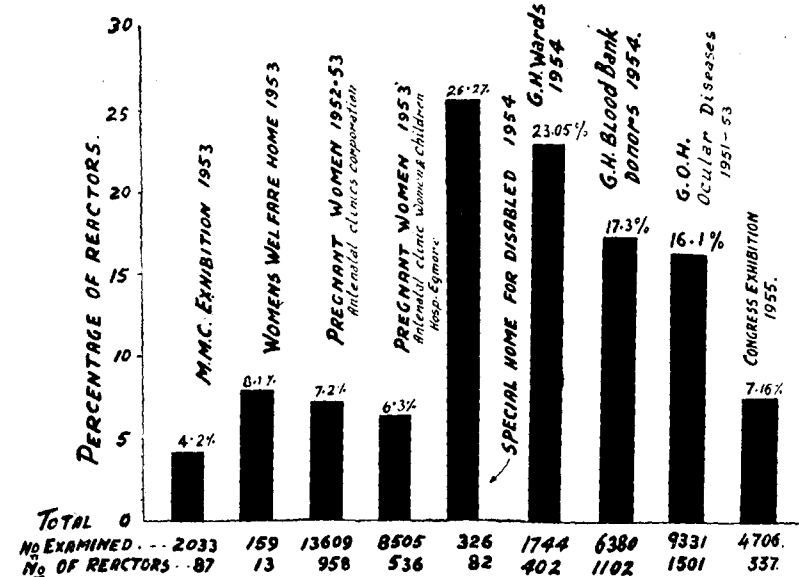


Chart 5

It will now be in proper sequence to stress the importance and value of the serological tests, even over the dark-ground

illumination test for the demonstration of the *Treponema pallidum* (vide Chart 5, p. 799). The next chart refers to the work done not only in the Madras City but throughout the whole Madras State (vide Table I, below). It will be seen that during the year 1957, as many as 42,348 serological tests were performed in the laboratory of the Institute of Venereology which serves

TABLE I Showing

TOTAL NUMBER OF SEROLOGICAL TESTS DONE AT THE VARIOUS INSTITUTIONS IN THE MADRAS STATE AND THE NUMBER OF POSITIVE REACTORS IN THE YEAR 1957.

S. NO.	NAME OF THE INSTITUTION	TOTAL NO. NUMBER OF TESTS			PERCENT. REACTORS.	PAGE.
		TESTS	POSITIVE	PERCENT.		
1	INSTITUTE OF VENEREOLOGY, MADRAS	42,348	7,601	17.9%		
2	KING INSTITUTE, GUINDY	KAHN 17,233	2,505	14.5%		
	FROM APRIL 57 TO MARCH 58	WR 7,763	1,517	19.5%		
		VDRL 18,521	2,720	14.7%		
3	CORPORATION PUBLIC HEALTH LABORATORY, MADRAS	13,425	685	5.1%		
4	MADURAI MUNICIPAL CLINIC, MADURAI	19,146	2,505	13.08%		
TOTAL		118,436	17,533	14.80%		

also the General, the Stanley and the Women and Childrens' Hospitals in the city of Madras. During the same period the King Institute at Guindy carried out 17,000 Kahn tests, 7,000 Wassermann tests and 8,000 VDRL tests for the several districts in the State; and the Public Health Laboratory of the Madras Corporation during the same period, performed 13,000 blood examinations. The Municipal Public Health Laboratory at Madurai working independently performed 19,000 tests and the Pasteur Institute at Coonoor did 3,000 tests for two years. Thus over a hundred thousand serological tests have been carried out in that year with the express object of ascertaining the incidence of syphilis in the population. Besides these, privately owned laboratories in the city and mofussil have also been carrying out the different serological tests for syphilis; but we have no means of ascertaining even approximately, the probable total number of such tests.

Syphilis discovered by blood-tests alone was revealing, for in the Ophthalmic Hospital about 6,000 patients were screened during a certain scheduled period and 16% of them proved to be positive reactors. In the Government Mental Hospital at Kilpauk, more than 1,500 patients were screened and over 150 of them were positive. Among pregnant women attending the ante-natal clinics of the Women and Children Hospital at Egmore, 6.3% were positive; of the Corporation clinics of Madras 7.2% and of the Madurai Municipal Clinics 13%.

If a diligent and co-operative serological survey can be carried out on the general population, quite a large number of latent or hidden cases will come to light and can be treated early thereby preventing later irremediable lesions from deve-

loping. This is certainly a matter for consideration and early implementation of measures in the interests of public health.

Let me now deal with the B.F.Ps. in serological diagnosis. I may premise by stating that the B.F.Ps. should not deter us from resorting to the use of this test for diagnosing syphilis. The serological test for syphilis, as every one knows, is not a specific test. We have to-day the Kahn, the Wassermann and VDRL-slide-tests, besides a host of other modifications. The basic principle underlying the non-specific serological tests for syphilis, is that when a person contracts syphilis, there is elaborated and is in circulation in the tissue fluids, a reactive substance which is a specific anti-treponemal antibody; there is in addition another substance which would appear to be antilipoidal in character. In certain other diseases also, not due to *Treponema pallidum*, the patients develop certain anti-lipoidal substances in their blood-sera. Serological tests for syphilis like Kahn, WR or VDRL in some of these cases may yield a positive reaction. A positive reactor under study presenting sufficient other data to exclude syphilis is labelled as a B.F.P. case.

A positive reaction reported on the serum of an individual by the serologist must be well studied before the diagnostician attempts to treat the positive reactor as a syphilitic. In his statement on the interpretation of serology at a Serologists' Conference held in the United States of America. Dr. Hinton, the great serologist, said, "God knows, but I do not know when I send out 100,500,1000 and more reports on serological tests whether all those who are positive suffer from syphilis or not. Some may have pneumonia, acute staphylococcal infection or any of a large number of other things." A positive reaction may be obtained with the sera of horses, cows, pigs, chicken etc. It is on record that positive reactions were had in over 65% of 239 specimens of sera from horses, in 50% of 500 sheep-sera, and 80% of 500 pigs' sera. These positives however, are not due to syphilis because, the lower animals do not suffer from syphilis. It is desirable that all physicians realize this fact, as then, they will not treat every positive case as syphilis.

We often come across distressing reports of homes being wrecked, divorces and suicides being frequently resorted to and cordial relationships getting strained among the staff in the Navy, Army and Air Forces, as a result of the vagaries of the B.F.Ps. Many young women have remained unmarried and widowers single! Worse than all, is the development of syphilophobia driving the public into the mental asylum. But let me repeat that this snag in serology is but a thorn in the rose and should not make us falter in our faith regarding its wide sphere of usefulness. Let us not therefore, attempt to hold back sero-

logical tests for syphilis from being made available freely and widely.

After all, the B.F.Ps. are not numerous, nor very frequent either. One in three thousands among normal people may occasionally react positively to the test (*vide* Table II). Malaria,

TABLE II

B.F.P. NORMAL PERSONS 1 IN 3000.
INFECTIONS:

SPIROCHAETAL RAT BITE.
RELAPSING WEILS 25%
BACTERIAL-LEPROSY 40 to 60%
T.B. 1 to 3%
PNEUMONIA-5%
PROTOZOAL-MALARIA 100%
VIRUS PNEUMONIA 20%
UPPER RESPIRATORY INFECTION 5 to 20%
INFECTIOUS HEPATITIS-20%
VACCINIA-20%
COLLAGEN DISEASES-50%

now being fortunately sought to be eradicated from our midst by various public health national and international organizations, used to give cent per cent false positives for 2 to 4 weeks from its onset. Kala-azar also yields a high percentage of positives as also cutaneous leishmaniasis. Vaccinia is said to yield 10 to 35% of positive reactions, usually about 12 days after the vaccination and to persist for 3 to 4 months thereafter.

In this context, I wish to refer to the work done by our Institute sometime ago under the auspices of the Indian Council of Medical Research, to evaluate three serological tests for syphilis *viz.*, the Kahn, WR and VDRL tests as regards their comparative sensitivity, specificity and reproducibility. Information relating to the clinical status of the donors of the specimens of sera was kept secret, after a careful examination had been made of the individuals concerned. Fifty cc. blood were drawn from each of them. The sera were then divided into aliquot parts of 2 cc. each, merthiolate was added, and after sealing they were sent to different laboratories in the country on the understanding that the material will be tested by the three techniques:—Kahn, WR and VDRL test, using the standard procedures on specified reacting sera a quantitation would be undertaken and a report sent to us in due course. This was carried out for some years and the conclusion reached at the end was that of the three tests, Kahn was the most specific, VDRL being a close second, while the Wassermann came third. As for sensitivity, the VDRL-slide-test ranked first, Kahn came next and WR again the last. Even as regards reproducibility Kahn and VDRL seemed to run parallel. As a result of this enquiry the decision was reached that the VDRL-slide-test should become the universal serological test for syphilis for the whole country, by reason of its being easy to perform and its results becoming quickly available.

Further, this test can be performed by a person who has had only a short course of training in the technique.

An interesting episode occurred at this juncture:—One of the lady house officers who had donated blood for this study, showed a positive reaction. It so chanced that this lady doctor was absent when the results were known. I went in search of her and found her in bed, ill with an attack of exanthematous fever—modified smallpox. The positive serological reaction was easily explained. After convalescence her blood was retested and found to have reversed to negative.

Coming to the non-syphilitic venereal diseases, granulomas of venereal origin, granuloma venereum and lymphogranuloma venereum often yield a positive reaction in some cases. Giving them the benefit of the doubt, we treat such cases for syphilis, besides administering the specific for the particular granuloma.

Of the non-venereal treponemal infections, yaws is prevalent in the plains of Coimbatore close to the Nilgiri hills. In this disease, the serology is positive. It is indeed difficult, often impossible to distinguish the *Treponema pallidum* from the *Treponema pertenue*, the respective causative agents of syphilis and yaws, for they are morphologically identical. The clinical lesions, particularly of the late stage are also very similar. The histopathology of the two conditions is just a distinction in degree, and so not very helpful, but the treatment is the same. Yaws does not require such a high total dosage of PAM as for syphilis. In this connection let me cite the report of a puzzling case, we had sometime ago:—

A young girl looking much too young to have attained the menarche, was admitted into the Institute of Venereology for examination and treatment of a large ulcer on the abdominal wall and similar ulcers over the lower extremities. She reported from an area near Poonamallee where non-venereal treponemal infection was suspected to be endemic. The history was negative, for any sexual episode. On the bases of her supposed innocence, the endemic occurrence of yaws in the Poonamallee area, the presence of the large extra-genital lesions suspicious of yaws, the demonstration of treponemes suggesting *Treponema pertenue*, *Treponema pallida*, the histopathology indicating treponemal infection, but chiefly relying on the basis of the high titre positive serology, she was taken to be a case of yaws. A portion from the ulcerative lesions was excised and inoculated into two rabbits, both of which died within 48 hours. She was put on anti-syphilitic treatment and investigations were started from the epidemiological angle. The local Health officer was alerted and asked to comb the areas for other cases of yaws. While we were thus fully absorbed in the extensive yaws-hunt, the woman staff nurse in the ward suspected a baby in the patient's womb! We felt really stunned when a plain skiagram of the abdomen of the girl revealed a miniature skeleton of a foetus! (*vide* skiagram overleaf). Here then we have a case of syphilis masquerading as yaws; or may it still be yaws in a girl who was having a baby? This is a matter for speculation.

In the list of the different conditions that are mentioned as giving rise to B.F.Ps., leprosy stands foremost yielding some-

where about 60% to 80% of positives. During recent months we have with the co-operation of the Leprosy Department of the Government General Hospital examined 310 cases of leprosy (283



FIG. 8

males and 27 females) at the Institute of Venereology for evidence of syphilis. Whenever syphilis was found the case was not included in the enquiry. The rest of the cases had their classification of leprosy recorded and their bloods were put to the Kahn, WR and VDRL-slide-tests (see Table III, below). Whatever the category of leprosy, we found on the aggregate that WR was positive in 22%, VDRL was positive in 19% and Kahn positive in 14%. So the very high figures for B.F.P. in the cited list are not in conformity with our findings.

TABLE III

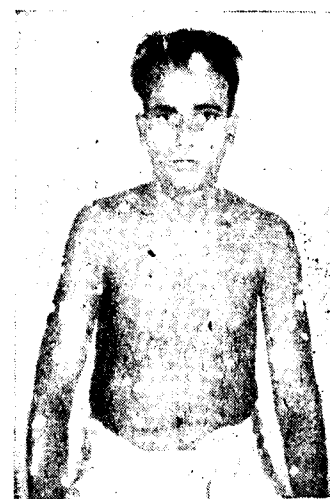
Showing the results in 310 cases of Leprosy investigated serologically

Males: 283 or 91.3%; Females: 27 or 8.7%; Lepromatous: 112 or 36.1%; and non-lepromatous: 192 or 61.9%; Atypical 4 or 1.3%; Unclassified 2 or 0.71%.

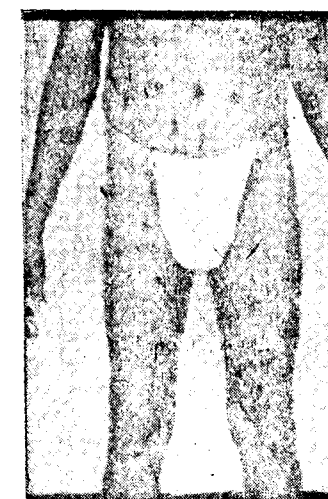
	VDRL Pos.	Kahn Pos.	WR Pos.	TPHA Pos.
Lepromatous	M 26 } 28	22 } 24	35 } 40	26 } 28
	F 2 }	2 }	5 }	2 }
Non-lepromatous	M 27 } 31	16 } 19	25 } 29	23 } 27
	F 4 }	3 }	4 }	4 }
Atypical	M 0 } 0	0 } 0	0 } 0	0 } 0
	F 0 }	0 }	0 }	0 }
Unclassified	M 1 } 1	1 } 1	1 } 1	0 } 0
	F 0 }	0 }	0 }	0 }
Total	M 54 } 60	39 } 44	61 } 70	49 } 55
	F 6 }	5 }	9 }	6 }
Percentage	M 19.08 } 19.85	13.78 } 14.19	21.20 } 22.58	17.31 } 17.74
	F 22.22 }	18.57 }	33.33 }	22.22 }

In recent times, we have also had to take into consideration of B.F.Ps, the collagen diseases comprising scleroderma, rheumatoid arthritis, lupus erythematosus etc., as these have been credited with a high percentage incidence of biologic positive reactivity. We have had in our wards two cases of collagen diseases referable to skin and muscle and several cases of rheumatoid arthritis with a positive reactivity. It is very difficult for us to confirm or refute the diagnosis of syphilis in these patients and then to decide if syphilis is causal or coincidental.

While on BFPs, I would mention a case which somewhat puzzled me, of a patient with rat-bite fever, who was admitted in the ward of the Institute with a healing lesion, indurated, on the left malar region of the face and a rash of an erythema nodosum-type over the rest of the body (vide pictures 1 and 2, below). The admitting officer considered the clinical condition to be



Picture 1



Picture 2

compatible with "lues" and had a serological test for syphilis done. The reaction was positive and anti-syphilitic treatment was therefore, contemplated. The Medical Officer had confirmatory evidence also for his diagnosis of syphilis; from the history of the patient he had elicited that a few months previously the patient was, in this same institution, diagnosed and treated for syphilis. A different tale however, for the latest clinical condition was given. While asleep, and in the early part of the night he was awakened by the fall of an object from the ceiling, on to his face. He woke up with a start and noted in the dark some object moving away, suggestive of a rat. At the site on the face where the object had dropped, he noted a bleeding wound. He applied "kalli" juice (*Euphorbia nerifolia*) to the wound and then forgot all about the episode. The lesion healed in a few days, but an induration remained at the site. In a week or 10 days, he experienced feverish bouts accompanied by a rash on the body. The senior medical officer concluded that the clinical condition was rat-bite chancre with its accompaniments. It was with some difficulty that the *Spirillum minus* was demonstrated. Multiple aspirations from the facial lesions, the lymph nodes underneath the mandible and the cutaneous

lesions failed to reveal the *Spirillum minus*. Repeated darkfield illumination tests of the blood proved negative. Finally a bit of the lymph node and another bit of the facial lesion were excised and introduced into guinea pigs intraperitoneally. One of the guinea-pigs yielded the *Spirillum minus* in the peritoneal fluid. The patient was then treated with penicillin.

Numerous cases can be cited to show the difficulty in accepting the diagnosis of syphilis on the basis of a single positive serological test for syphilis.

We had for instance, a case admitted into our ward with a rash confined to the face and extremities. The rash was papular and in some areas erythema multiforme in type. The patient was having fever and was somewhat dazed. The relatives of the patient attributed this to an injection of penicillin. Was this JH reaction due to penicillin? His blood serum reacted positively to VDRL slide-test. The patient was put on penicillin but within 3 days of admission, the patient's clinical condition worsened. The cutaneous lesions turned dark with evidence of umbilication. A biopsy was made of the cutaneous lesions. Darkfield illumination tests of the impression smears were negative for *Treponema pallidum*. Examination of CSF was negative. The patient was transferred to the I.D. Hospital where he died of hemorrhagic confluent smallpox within 3 days of admission.

Reports of a dozen additional cases with a positive serology and an initial suspicion of familial syphilis, cardiovascular syphilis, neurosyphilis, benign tertiarism in syphilis with the localization of the suspected syphilitic infection in the hard palate and with dislocation of the manubriosternal joint, were presented to the meeting with relevant photographs, skiagrams, microphotographs and laboratory results to focus attention, on how the aetiology of the clinical condition eventually proved to be non-luetic. (These reports have had to be omitted owing to exigencies of space).

Finally mention was made at the meeting of a subject of topical interest which is engaging the attention of the Central and Provincial Governments. The local hill-tribe of Adivasis consisted of 807 persons in 1901, but had gone down to 602 in 1951; this is a matter of grave concern as in a short time the tribe might further dwindle and disappear altogether. The sterility observed among the females of this tribe was believed to be due to syphilis. Another reason for incriminating syphilis as aetiological related to sterility was the incessant reporting of a high percentage of sero-reactivity among the tribesmen as judged by the available serological tests for syphilis; e.g., in 1927, the reactivity stood at 49%; in 1950 at 77% and in 1952 at 90%.

In view of the fact that a lightning survey of an unselected segment of the tribe carried out by me on their clinical status in 1952 practically indicated a total absence of either late or congenital syphilis amongst these people and since the indigenous group had been intermittently or continuously submitted to a fusillade of penicillin by enthusiastic social agencies during the

past decade, the high percentage of positive reactivity amongst them could not be easily reconciled. Is it likely that the B.F.P. reaction may account for the incompatibility or incongruity between the clinical status and the positive serologic reaction registered by the tribe? Rather than complacently accept the serologic verdict imposed on the Adivasis, I would prefer that every attempt is made to have the specific serologic tests applied to the sera of the population for eliminating the B.F.P. reaction from the true positive reactions, if any.

For this purpose, the T.P.I. Test is most valuable. This test is being performed in nearly 60 laboratories in the world but not yet in any laboratory in India. Incidentally, it may be pointed out that in the absence of the T.P.I. test, the T.P.A. and the T.P.I.A. tests and the recently introduced R.P.C.F. tests, have been under study in the V.D. Laboratory of the Institute of Venereology. There is the Fluorescent Antibody Technique (F.A.T. Test) recently introduced elsewhere also in the offing, which may help in the resolution of the B.F.P. problem.

In view of the imperative need for the T.P.I. test which would give the correct lead to puzzled clinicians, it is my considered opinion that we should take up this subject and do everything necessary to obtain for this Institute, the necessary grants to make available the essential apparatus for creating an atmosphere with a combination of carbon-dioxide and nitrogen and Nelson's medium, lyophilized or otherwise; it would approximately cost Rs. 75,000 to establish this technique at the V.D. Laboratory of the Institute of Venereology at Madras.

The technique would be carried out, by the highly trained Serologist at the V.D. Laboratory, already well versed in this technique for over a decade. Efforts made in this direction by the medical profession would raise the Institute and its status to a place of pride in the comity of nations. It will help not only our country but others also in the whole of South-East Asia to resolve their problems in the sero-diagnosis of syphilis. Reckoned in terms of money the price of B.F.P. is not high, but calculated in terms of prestige of the diagnostician and the practice of venereology, the cost is high enough to require the concerted efforts of the whole of the medical profession to get the T.P.I. test, performed in our country.

PREVENTING LITTLE STROKES

The administration of heparin or other anticoagulants, or drugs which dilate blood vessels, may prevent little strokes before they occur. The drugs should be administered at earliest symptoms. These symptoms, include the following: *vertigo*, *spinning* sensations, blurring of vision and muscular weakness.—(Dr. William W. Anderson, University of California Medical School in Calif. Med. Assoc. J., 23-2-1960).

EFFECTIVE CONTROL OF TETANUS SPASM

Effective control of one form of tetanus spasm has been achieved with the use of a tranquillizing drug. According to Meyer A. Perlstein, M.D., Chicago, *meprobamate* given intramuscularly is effective in controlling tetanus spasms created by the voluntary muscles. At the same time he reported that the drug has no effect on spasms created by the involuntary muscles.

Tetanus, or lockjaw, is an infectious disease which is usually caused by a puncture, laceration, or gunshot wound. Symptoms involve a tightening of the jaw muscles, baring the teeth, and the body may become bowed backward or sideward. Spasms follow.

According to Dr. Perlstein, "The mortality and severity of tetanus of all types is closely related to the interval between the appearance of the first symptom and the onset of spasms. The shorter this interval of onset, the worse is the prognosis." These spasms involve all of the muscles of the body and are extremely painful since the patient is always conscious. They can be triggered by bright lights, noises, pinpricks, or skin pressure.

In the past, the spasms have been treated with barbiturates and similar drugs which act on the central nervous system, these sedatives had many undesirable side-effects and often left the patient in a "deep sleep," unable to communicate with hospital attendants.

Following the use of *meprobamate* on a group of tetanus patients admitted to the Cook County Hospital in Chicago, Dr. Perlstein reported effects.

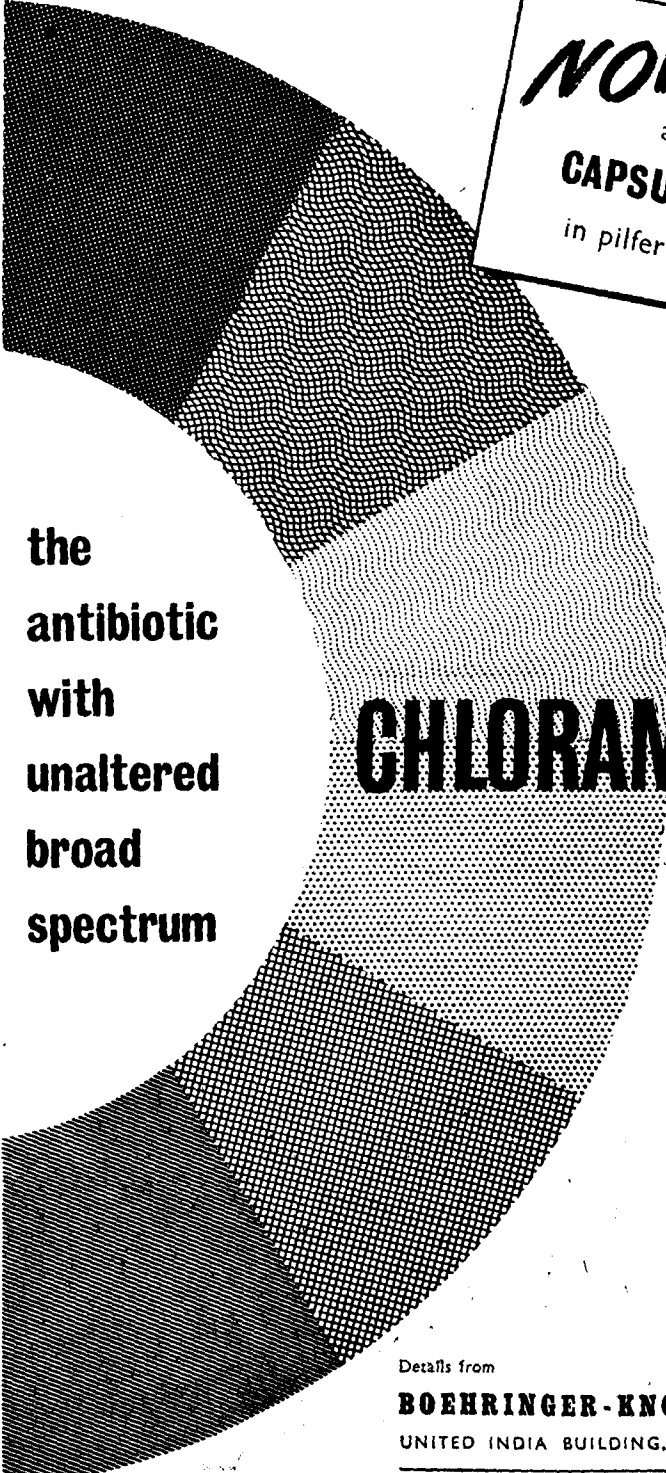
"*Meprobamate* had a tranquillizing action which allayed apprehension and made the patient generally more calm and comfortable. Nursing was greatly simplified. The patients were conscious and communicative, could respond to simple commands, and could make their needs known."

The drug was usually effective within ten to fifteen minutes after administration and its effectiveness lasted from three to four hours. *Meprobamate* was more effective by injection than 10 times the dose given orally.—(*J.A.M.A.*, 15-8-1959, via *N. Y. State J. Med.*, 15-1-1960).

PATHOGENESIS OF CORONARY ARTERY DISEASE

The importance of the subject of coronary artery disease is readily appreciated not only by physicians but also by intelligent laymen. Much has appeared in lay writing about heart disease and its relation to cholesterol levels and obesity. It has been repeatedly emphasized in the press and on the radio that diseases of the heart and blood vessels are responsible for more than half of all deaths and that a large percentage of such diseases develop from coronary artery disease. We must therefore take a stand on diet and medication, not only for the treatment but also for the prevention of atherosclerosis.

Many aspects of the pathogenesis of coronary artery disease remain to be clarified, and particular interest centres on the *metabolism of fats*. The author has studied the reactions of patients to different diets by standard chemical studies of total lipids, phospholipids, and cholesterol in the blood and also by a study of the particle-size of the lipoproteins of the blood. The results led to the conviction that the diet of patients with coronary artery disease should be designed to maintain the total blood lipid levels as well as the various fractions within normal limits. This is accomplished by limiting the daily intake of total fat to 50 gm. and keeping the intake of saturated fats as low as possible.—(*J.A.M.A.*, March 12, 1960).



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A RECENT SURVEY OF PREGNANCY HAZARDS*

A RECENT survey of consecutive births in a midland county of England, and selected births in nearby regions, provided an opportunity to:—

Alice Stewart, M.D., F.R.C.P.,
Reader in Social Medicine, Oxford University

(1) Study some of factors which are influencing birth-weight in a relatively affluent society; (2) compare events associated with successful and unsuccessful pregnancies; (3) examine maternal physique in relation to toxæmia of pregnancy; and (4) discover whether, under modern conditions, going out to work increases the risk of an unsuccessful pregnancy.

The survey began by covering a single year (1952) and including all live and still-births in a defined area and consecutive still-births and neonatal deaths in other defined areas. At a later date similar records were obtained from all underweight babies (5½ lbs. or less at birth) and an approximately equal number of heavier babies born in another area during 1955. The relevant information was obtained partly from existing records and partly from the mothers themselves. Each mother was interviewed in her home 6 to 8 weeks after delivery, to obtain a record of the living conditions and other facts relating to the mother, father and sibs of the new-born child, and discover where she had had the delivery and who had looked after her during the antenatal period. The relevant case records were examined and a summarized account of these was recorded on specially printed survey cards.

There were 4,051 births in the consecutive series, including 296 underweight babies (*see above*), 1,318 first babies, and 292 perinatal deaths (still-births and neonatal deaths). A further 786 perinatal deaths were obtained from the other regions surveyed in 1952. The 1955 data differed from the earlier data in as much as they all had in addition to post-pregnancy weights estimates of pre-estimates of the pregnancy weights of the mother. They described 643 mothers of underweight babies and 651 mothers of heavier babies—all single births.

The following samples were taken from the three sets of records:

(1) *Birth-weight studies*:—The underweight babies in the consecutive series included 46 twins, 6 triplets and 248 single births. The latter were divided into two groups, over and under 5 lbs. and compared with 276 singletons who weighed more than 6½ lbs. at birth—(every 10th child from the original set of consecutive records).

(2) *Perinatal deaths*:—The 1952 data were used to examine events related to successful and unsuccessful pregnancies; they

* Specially contributed to the ANTISEPTIC.

included 1,078 children who died before the age of 4 weeks and 1,078 children who survived for more than 6 weeks and were picked at random from the 1952 records.

(3) *Maternal physique*:—The relationship between maternal physique and toxæmia of pregnancy was studied in 2,495 mothers: 1201 from the consecutive series (post-pregnancy weights only) and 1,294 from the 1955 data (pre- and post-pregnancy weights). Approximately half of the mothers surveyed in 1955 had underweight babies and only 6% of the other series.

(4) *Work during pregnancy*:—This was studied in a group of 1,318 primiparæ from the consecutive series, which included 780 women who were described as "housewives only" and 548 women who went out to work. The working mothers included 295 who worked for less than 28 weeks and 253 who worked for longer periods.

TABLE I
Showing birth-weight and survival

Birth-weight	Under 5 lbs. No.	5-5½ lbs. No.	Over 6½ lbs. No.
Still births	23	9	1
Neonatal deaths	37	9	1
Survivors	56	110	274
Total	116	128	276
	Percentage		
Boys	55	48	53
First born children	43	37	36
Economic status:—			
Top grades	11	11	15
Lowest grades	18	33	26
Good diet	44	38	56
Good living conditions	62	43	57
Working mothers	64	56	33

Birth-weight studies.—There was a strong correlation between birth-weight and survivorship; 60 of the 116 babies who weighed less than 5 lbs. failed to survive, compared with 2 of the 276 babies who weighed more than 6½ lbs. and 18 of the 128 who weighed between 5 and 5½ lbs. (See Table I, above). Compared with the other babies, the exceptionally small babies included a high proportion of premature deliveries, first-born children, old mothers and illegitimate births. These items were recorded least frequently among the babies who weighed more than 6½ lbs. The toxæmia rate was also high in the group of small babies, but other illnesses, including injuries, operations, pyelitis, and virus infections, were equally distributed between the mothers of very small, medium-sized and normal infants.

Compared with India, the general standard of living was good and provided no opportunity to study the effects of gross

malnutrition or unhygienic living conditions. There were however, a few mothers whose diets were less good than usual and a few who enjoyed exceptionally good living conditions. The latter tended either to produce large babies, over 6½ lbs., or exceptionally small babies and the former tended to have babies who were slightly, but not greatly underweight, 5 to 5½ lbs. The babies of mothers who worked during pregnancy were concentrated in the underweight groups (*vide infra*).

The findings as a whole showed that factors other than poverty and malnutrition were influencing birth-weight. The nature of these influences was not determined but it is clear that this "residual problem" is one which it is appropriate to study in societies which are not suffering from gross effects of malnutrition.

Perinatal mortality.—A comparison of 1,078 children who failed to survive and 1,078 children who were in good condition four weeks after birth confirmed the well-known risks which attach to being the first-born child of an elderly mother, and the relatively good position of second and third children of young mothers (See Table II, below).

TABLE II
Showing well-known risks to the first born

	Cases Perinatal deaths	Controls survivors	Case/control ratios
<i>First children:</i>			
Mothers over 33 years	48	20	2.4
Mothers 26 to 32 years	124	109	1.14
Mothers under 26 years	250	229	1.1
<i>Second and third children:</i>			
Mothers over 33 years	118	115	1.03
Mothers 26 to 32 years	197	261	0.75
Mothers under 26 years	114	160	0.71
<i>Later born children:</i>			
Mothers over 33 years	80	127	1.59
Mothers 26 to 32 years	83	94	0.88
Mothers under 26 years	16	11	1.45

A list of unusual events before and during delivery also showed the extent to which these were associated with an unsuccessful outcome to the pregnancy (See Table III, overleaf).

Maternal miscarriages were reported more often by mothers of dead children (59) than by mothers of survivors (19), and the former included more illegitimate children (52) than the latter (37). The incidence of Rhesus-negative mothers among the multiparæ was equally high in the two groups—99 cases, and 99 controls. Mothers described as "short and fat" featured more often among the cases (26) than the controls (13); and mothers

with the opposite type of physique ("tall and thin") were less common among the cases (29) than the controls (36). These differences are probably related to the high incidence of toxæmia among women who were overweight for their height (*See later*).

TABLE III
Showing unusual events influencing outcome of pregnancy

	Cases (perinatal deaths)	Controls (survivors)	Case/control ratios
<i>Antenatal illnesses:</i>			
Toxæmia (severe and moderate) ...	170	34	5.0
Toxæmia (mild) ...	68	61	1.1
Anæmia (Hb under 75%) ...	108	62	1.7
Injuries and operations ...	35	12	3.0
Virus infections ...	16	16	1.0
Other illnesses ...	124	100	1.2
<i>Antepartum bleeding:</i>			
1st half of pregnancy ...	70	26	2.6
Placenta prævia ...	25	5	5.0
Other late hæmorrhages ...	122	9	15.7
<i>Abnormal deliveries:</i>			
Precipitate labour ...	54	28	1.9
Dry labour ...	11	5	2.4
Prolapsed cord ...	30	1	30.0
<i>Other findings:</i>			
Hydræmnios ...	46	1	46.0
Congenital defects ...	257	26	9.9

It will be noticed that in this investigation no use was made of death certificate data. All too often the stated cause of death merely described the mode of dying, and it seemed preferable, in the present state of knowledge, to make no assumptions about the fundamental causes of death.

Maternal physique and toxæmia.—The records of weights and heights were used to distinguish mothers who were over- or underweight in relation to their height. The actual yardstick which was used included the height in inches, divided by the cube root of the weight in pounds; and six physique categories were recognized. Four grades of toxæmia were recognized. (*See Table IV, below*).

TABLE IV
Showing the grades of toxæmia

Toxæmia grades	Antenatal records		Toxæmia
	Stated toxæmia	Diastolic B.P. (mm. Hg.)	
4	Yes	Unrestricted	Certain
3	Nil	Over 95	
2	or	90 to 95*	
1	Uncertain	81 to 89	Doubtful
0	Nil	Under 81	Absent

*A few cases with transient albuminuria and low blood pressure were placed here.

The following account is based on a comparison between all Grade 4 toxæmias (129 primiparæ, 85 multiparæ) and all other grades of toxæmias (412 primiparæ, 668 multiparæ). The survey records were first inspected for differences between the physique assessments which had been based on pre-pregnancy weights (1955 data) and those which were based on post-pregnancy weights (1952 and 1955 data). The results showed that it was

safe to take either assessment, and that in both series the proportion of mothers with Grade 4 toxæmias was appreciably higher among mothers who were overweight for their height (obese group) than among mothers who were underweight for their height (*See Chart 1*). From the point of view of toxæmia, there seemed to be an optimum physique which corresponded to women who would be regarded in England as appreciably thinner than usual.

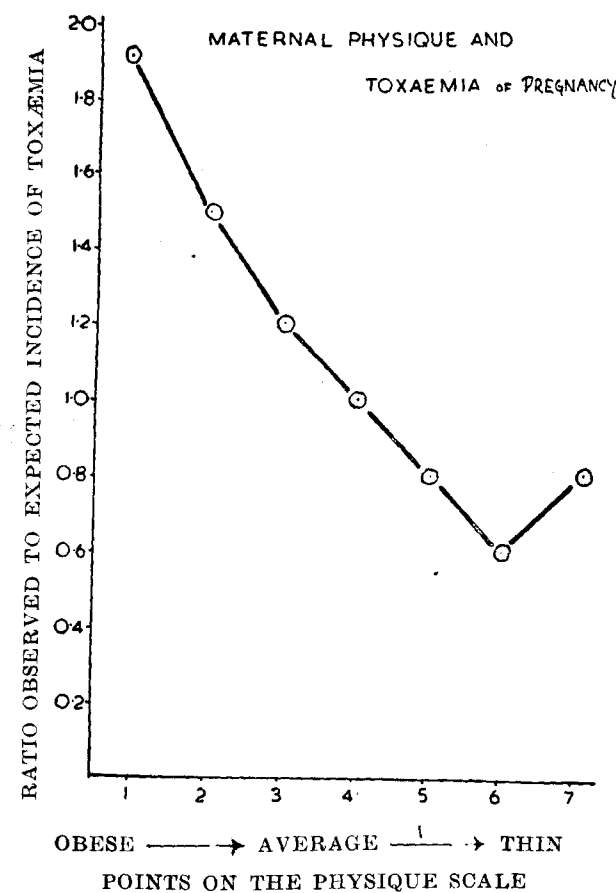


Chart I

Finally, division of the mothers into two groups (over and under average weight for height) showed that the toxæmia risks were about twice as high for the "overweight"

half of the population as the "underweight" half. The actual risk was greater for primiparæ than multiparæ, but the difference between the two physique groups was the same in both series (*See Table V, overleaf*).

When the mixed group (Toxæmia grades 3-0) was subdivided, it was found that grades 0 and 1 were behaving alike, and that the women with grade 2 and grade 3 toxæmias had affinities with the women who had more definite signs of toxæmia. (*See Table VI, overleaf*).

These results suggest that there were a few "missed" cases of toxæmia in the intermediate grades and that it is, in general,

TABLE V

Physique groups*	Ratio observed to expected numbers of Grade 4 toxæmias	
	Primiparae	Multiparae
Overweight (Group A) mothers	1.42	1.33
Underweight (Group B) mothers	0.62	0.52
Ratio A/B	2.29	2.55

* Includes all mothers divided into two groups with

$$\text{Ht.} \div \sqrt[3]{\text{Wt.}} = + 12.7 \text{ (underweight)} \\ - 12.7 \text{ (overweight)}$$

TABLE VI

Toxæmia grade	Ratio of overweight of underweight mothers	No. of cases
0	0.84	1,334
1	0.82	458
2	0.98	292
3	1.09	71
4	1.75	367

tion there were more old mothers among the women who never went out to work (42% over 25 years of age) than among the working mothers (25% over 25 years of age). It follows that if other things had been equal the workers should have had more successful pregnancies than the non-workers.

The incidence of toxæmia turned out to be the same in the non-working group and in two groups of workers (long-term and short-term). Other findings are summarized in Table VII (See p. 815). The principal difference between the workers and non-workers

safe to assume that a diastolic blood-pressure of less than 90 mm. Hg. is normal, at least for English women. Comparable surveys of Indian women would probably include a higher proportion of exceptionally thin mothers and are needed to discover

whether the suggestion that there is an optimum physique from the point of view of toxæmia of pregnancy is correct, or whether malnutrition is a protection against toxæmia.

Work during pregnancy.—
In the group of primiparae who were chosen for this investiga-

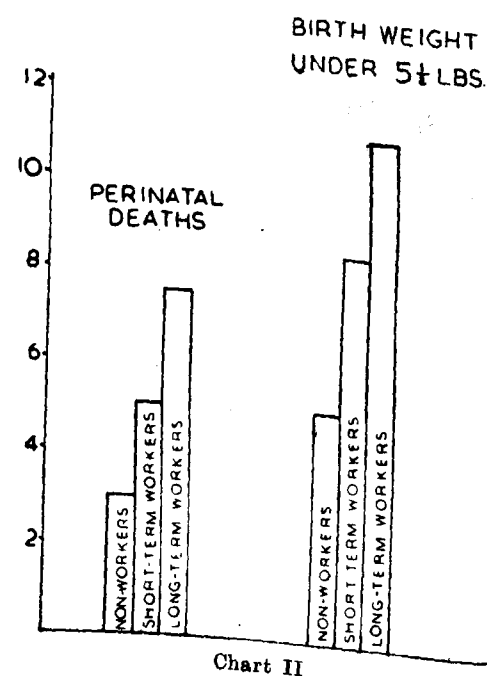


Chart II

was a higher incidence of perinatal deaths and underweight babies among the former than the latter (See Chart II, on p. 814).

TABLE VII

Showing the work during pregnancy
(Comparison of three groups)

PERINATAL DEATHS				
		Non-workers per centage	Short-term workers per centage	Long-term workers per centage
All births:	...	2.8	4.9	7.5
Pre-marital conceptions*	...	4.8	9.7	12.9
Upper income groups	...	1.9	—	—
Lower income groups	...	3.9	6.0	12.3

UNDERWEIGHT BABIES (less than 5½ lbs. at birth)

All births:	...	4.7	8.4	11.1
Pre-marital conceptions*	...	6.3	14.5	14.1
Upper income groups	...	2.6	3.3	5.9
Lower income groups	...	7.8	10.4	13.9
No. of Mothers	...	780	295	253

OTHER FINDINGS

All births	...	14.1	14.4	15.4
Toxæmia of pregnancy	...	12.9	10.5	9.1
Forceps deliveries	...	0.4	0.7	1.6
Congenital defects	...	26.0	22.7	28.9
Lowest income brackets	...	20.0	20.2	6.7
Highest income brackets	...	9.9	12.3	14.6
Short gestation period†	...	...	...	...

* Including unmarried mothers

† Delivered 15 or more days before expected date.

This was confirmed in two samples matched for age, social class and legitimacy: (See Table VIII, below).

TABLE VIII

Showing samples matched

	Prematurity rates*
First matched sample	%
143 non-workers	... 2.1
143 mothers worked for less than 28 weeks	... 4.9
Second matched sample	
152 non-workers	... 7.3
152 mothers who worked for more than 28 weeks	... 1.3

* Prematurity rates = incidence of babies weighing less than 5½ lbs. at birth.

There were no indications in the records that the mothers were exposed to a specific hazard during their working hours, but it was exceptional for these mothers to have anyone to help them with their housework. The fatigue which is apt to accompany such a situation may have reduced the appetites of the mothers and in so doing reduced the weights of the unborn children. If this conclusion is correct,

it was not work *per se* which increased the risk of an unsuccessful pregnancy but general overwork and fatigue.

Summary.—The main purpose of the survey was to demonstrate the permanent value of day-to-day records kept by midwives and obstetricians, and to encourage clinicians to become epidemiologists in their spare time.

Needless to say, no startlingly new discoveries have been made, but it is unlikely that exactly the same results would be obtained if similar records were kept of pregnant women in other parts of the world. If such records were available, it would help to distinguish between what may be called the basic hazards of pregnancy and the hazards which depend on local customs and characteristics.

Apart from a few facts which are not as a rule recorded on medical case sheets, but could easily be obtained from patients if they were thought to be of value, the survey is based on data readily available in antenatal clinics because they are an essential part of the daily routine. Comparable data should be easy to obtain elsewhere and no doctor need be pessimistic because he lacks elaborate laboratory facilities or has difficulty in obtaining statistical assistance. Midwives, health visitors and mothers are usually anxious and willing to co-operate in this type of investigation and provide between them nine-tenths of the skills which are required; the remaining tenth is supplied by any doctor who has the patience to keep systematic records and knows how to multiply and divide.

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Oxford, UK.

DIABETIC NEPHROPATHY

Shea and his colleagues have reviewed their experience with Kimmelstiel-Wilson lesions at autopsy. They were particularly interested in the relationship of nodular intercapillary glomerulosclerosis to the renal hyaline arteriosclerosis so often seen. They were also interested in the relationship between the nodular glomerulosclerosis and the duration of diabetes. The results of their studies, combined with the results of other authors, suggest that nodular intercapillary glomerulosclerosis is practically pathognomonic of diabetes mellitus. There are apparently rare instances of this lesion in nondiabetic persons. The presence of the nodular glomerular lesions correlated very well with the severity of arteriolar hyalinization in the kidney.

The authors believe that these two lesions, *i.e.*, nodules and arteriosclerosis, are separate manifestations of the diabetic state and not, as some authors have suggested, casually related to each other. No relationship could be demonstrated in this study between the severity of intercapillary glomerulosclerosis and the severity of the diabetes as measured by insulin requirements. The same was true with renal arteriolar hyalinization. Some correlation was found between the severity of the nodular glomerular lesions and the known duration of the diabetes.—(A.M.A. *Arch. Pathol.*, 68: 447, via G.P., April 1960).



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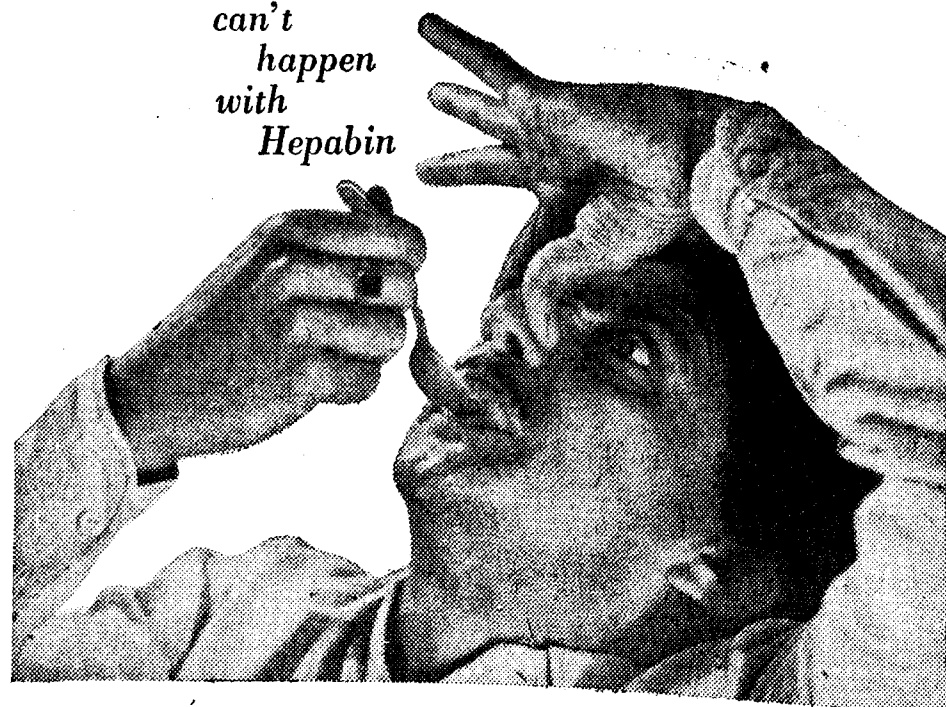
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ACUTE INDICATIONS OF CHLORPROMAZINE*

THIS paper is intended to record and discuss the results of my first hand experi-

A. S. RANADE, M.B., B.S.,
Poona-2

ence and observations, on the use of Largactil in small doses in acute conditions where it is indicated; also my observations on a series of 51 cases, which I have classified into four groups taking the hypothermic effect of the drug into consideration. The results of using short course and small dose therapy of this drug in various other acute conditions are also recorded.

Largactil in pyrexia.—Thanks to the clinical thermometer, temperature is perhaps the most accurate and easily measurable criterion in medical practice. Yet even this advantage is often lost by numerous adverse factors that cause rapid spontaneous fluctuations in temperature and at times even wide variations in a matter of a few minutes.

This mercurial nature of the temperature adversely affects the correct assessment of any temperature-reducing agent. In order to minimize such error, I have tried to multi-control my observations on the hypothermic effect of Largactil by dividing 51 cases into four groups.

GROUP I:—Largactil was tried alone to see, if it could *per se* exert any hypothermic effect, such as was noted by Decourt *et al* in their experiments on warm-blooded animals.

All the 12 cases in my series showed a fall of temperature but a careful assay of the relevant data, would point to the effect being ascribable to Largactil only in 3 cases. In these three cases, the reduction was moderate, on an average about 0.5°F in 12 hours, an initial average of 104°F coming to normal over an average of 3 to 4 days.

GROUP II:—This consisted of 6 selected cases with a fairly constant-temperature-pattern and with the expected run of temperature presumably known for the few days ahead. In addition, I increased the trial drug at intervals to see if the expected swing of temperature continued. Aspirin and Largactil were given in alternate doses in the same case and on the same day.

In one half of the cases, the fever rose inspite of either drug, Aspirin or Largactil. In the remaining cases it was repeatedly found that where Largactil failed, Aspirin lowered the temperature at least for an hour or two. The impression was gained that, used alone, Aspirin is superior to Largactil as an antipyretic in the dosage employed *i.e.* Aspirin gr. 1 per year of life, 4 hourly and Largactil 1 mg./kg. body wt. daily, in divided doses, in children and Aspirin gr. 10 and Largactil mg. 10 *t.d.s.* in adults.

* From the paper read at the 6th Poona Medical Congress on the 5th of June, 1960.

Specially contributed to the ANTISEPTIC

Aspirin had also the advantage of carrying less risk. In favour of Largactil it must be said that its peculiar sedative effect was useful in the insomnia frequently occurring in acute febrile illnesses.

In the next 21 cases comprising my group III, Aspirin or Largactil was first tried alone and then together in each case. In some, the process was repeated twice. On 27 occasions, the combination succeeded where either drug alone failed. The reverse happened only on 3 occasions. The combination was, thus, much more effective than either given alone. By reference to the previous group it is clear, that in this latter combination Aspirin was the sheet-anchor, and Largactil the adjuvant. Thus, Largactil also potentiates the hypothermic action of drugs just as it is known to enhance the effect of analgesics, hypnotics and narcotics.

In the last 12 cases (group IV), the combination was used from the beginning. The results were quick and certain and confirmed the above observations.

Feghali produced excellent results in treating cerebral malaria in infants by a combination of Largactil, Phenergan, Pethidine and surface-cooling. My combination of Largactil and aspirin, though less effective, is a much simpler weapon that will be handy in daily practice.

Psychosomatic disorders.—A general practitioner is rightly called a specialist in psychosomatoses because he watches them while growing and transforming. These illnesses tend to undergo spontaneous variations and their response to treatment should therefore, be cautiously assayed. Their diagnosis is difficult, and is made usually, by exclusion of organic illness, assisted by the peculiar clinical picture and by a reasonable confirmation from their response to treatment.

Our selection of cases was very carefully made and comparison was instituted with similar cases treated with other sedatives, chiefly Gardenal or by alternating the drugs in the same case.

Group I includes anxiety neuroses and allied conditions like neuro-circulatory asthenia. All the cases were treated only during the acute phase. As soon as the patient had tolerably improved, Largactil was withdrawn. A follow-up was made for about 3 months, as our main object was to study the immediate effect in overcoming the acute phase.

There were six cases of the general type of anxiety neurosis evidenced in the multiple systems and symptoms; Cardiac and gastrointestinal neurosis accounted for 3 cases each; and 2 were of neurocirculatory asthenia. All but these last two showed definite improvement. In a few, Gardenal had failed previously.

Largactil was used for 2 to 5 days on an average in all cases except the two failures where it failed after 10 days' trial. The dose was 10 mg. *t.d.s.*, increased if necessary to 25 mg. Those who reacted favourably did so with smaller doses, while higher doses caused side-effects except in one case where an increased dosage was necessary to elicit the desired response. An interesting feature was that many cases had symptoms of hyperchlorhydria which responded more gradually than the general symptoms. The gastrointestinal neurosis in my cases were probably less severe than those described Asher.

I then tried Largactil in intractable cases of insomnia in adults and extreme restlessness, crying and insomnia in children, especially during severe illness. Cases of obscure aetiology were specially chosen, and Largactil was tried when Gardenal failed. Twenty of 24 cases responded well and the results agree with the findings of Delay and Deniker in cases of insomnia. Of the 4 cases that did not respond one was suffering from constipation, a relief of which banished the restlessness. A second child responded at the start, but later became refractory, due probably to constipation which was a side effect of Largactil therapy.

The next group comprised of cases of systolic hypertension and included a few borderline cases of biphasic hypertension, and I believe that the former may change into the latter under certain circumstances. In a few cases Gardenal was tried before Largactil. Fifteen out of 18 responded. In all of them, there was a fall in blood-pressure and a clearing-up of associated symptoms, like early morning breathlessness. In the failures also symptomatic relief was obtained but the blood-pressure actually rose. Largactil thus gives a deceptive feeling of improvement sometimes while the underlying process worsens. This is comparable with cortisone in infectious diseases when not covered by appropriate anti-infective measures. In one case there was no response with the usual dose of 10 mg. *t.d.s.* and 25 mg. produced severe dizziness and the patient refused to continue the medication.

It is interesting that the single dose gave symptomatic relief and a normalization of blood pressure. On certain occasions this case registered a slightly high diastolic pressure also. It is perhaps a borderline case between systolic and biphasic hypertension. The next group of 6 cases of minor psychosis did not respond favourably at all.

Another group comprised cases of hyperchlorhydria or peptic ulcers, in which psychological factors played an important role. Fifteen out of 18 cases responded. The effect was gradual and the relief of symptoms was partial except in a few, where it was prompt and complete. This would appear to show that Largactil acts best wherever psychological factors are predominantly responsible for the condition. It may perhaps be suggested that

the exhibition of small doses of Largactil may help to detect cases of hyperacidity and peptic ulcer in which psychic factors are more significant. Such screening may also be profitably extended to the detection of other disorders in which the emotional component varies from case to case—e.g., eczema, psoriasis, ulcerative colitis, asthma etc.

Dobkin *et al* record a marked reduction in gastric secretion and Tilley *et al* and Reiss describe the beneficial effects of Largactil in cases of eczema and psoriasis in which stress and emotion played an important role.

In a very chronic case, with a history suggestive of an important psychic factor, all therapeutic measures like antacid, antisecretory and antispasmodic, had failed; and the patient felt desperate. A short course of Largactil helped him to tide over this state and he then benefited by the usual measures. Here again Largactil resembles cortisone, in its preparatory function. A third point of similarity between them is that, neither of them has a curative action. Largactil is perhaps effective only in psychosomatic illnesses. Largactil was tried only in 5 cases for relief of pain. It appeared only to potentiate the action of ordinary analgesics. Wallis has stated that in the face of excruciating pain Largactil produces a state of emotional indifference instead of the fear of death.

In a miscellaneous group of 10 cases, I did not obtain any striking results.

Indications for the use of Largactil:—In vomiting and hiccough its value has been established beyond doubt. (Boyd and Cassel; Brand *et al* and Friedgood *et al*). I treated 41 cases of vomiting and 10 of hiccough, and the following interesting observations deserve to be recorded:—

(1) In cases of typhoid fever treated with the lifesaving chloromycetine, the tendency to vomit out the drug was controlled by Largactil.

(2) Where the antiemetic effect is not adequate a search should be made for any peripheral cause that should be remedied. In a case of pregnancy-vomiting, the expulsion of roundworms restored the full antiemetic action of Largactil, which acts best in vomiting of central origin.

(3) Too early suppression of vomiting, especially in gastritis, leads to toxic absorption.

Hiccough.—Friedgood *et al* have used 50 mg. of Largactil intravenously. In my experience, except in the most severe cases, Largactil orally is good enough and less risky. The idea is to control and not to abolish hiccough. The presence of hiccough is an index to the behaviour of the underlying condition which is also being treated and this valuable guidance is lost if it is

totally suppressed. What is more, the disappearance of the residual hiccough, without any increase in the dose clearly shows that the basic treatment is doing good and it is time to withdraw Largactil.

SIDE-EFFECTS:—Side-effects were usually rare. In 200 cases, only mild side-effects occurred in twelve cases only—drowsiness, indifference or apathy in 4, dizziness in 3 (somewhat severe in 1), dryness of the mouth in 2 and constipation in 2. In one case, contrary to published reports, a diminution occurred in the frequency of micturition, from every $\frac{1}{2}$ hour to every 1 hour.

Another noteworthy point was that, Largactil was well-tolerated by children. As advised by Rea *et al* I countered any side-effects that did occur, by simple measures like the head-low position.

Summary.—From a consideration of the effects and side-effects noted in a series of 200 cases, I consider that a short course and a small-dose treatment with Largactil gives encouraging results in psychosomatoses, insomnia, vomiting and hiccough, especially when these do not respond to other treatment. In pyrexia it is a valuable adjunct to the standard therapy like aspirin and physical cooling, especially when the fever seems to get out of hand. In relieving pain, it will supplement the action of the analgesics and narcotics. In the other conditions I tried it was rather disappointing. In some of these a higher dosage and a longer treatment might have succeeded, e.g., major psychosis. A small dose and short course Largactil therapy, is effective, and possesses certain advantages. Thus it is economical, less risky, suitable for office practice, and its side-effects are negligible. It is practically devoid of the three major hazards with higher doses and longer courses, jaundice, drug fever and agranulocytosis. In most of my cases the therapy was limited to less than 5 days and Doughty considers that the short period therapy will make for smooth sailing as regards the three major complications.

Acknowledgement.—My thanks are due to M/s. May and Baker for the liberal and free supply of Largactil, used in this study.

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Poona-2.

ALARMING NEUROMUSCULAR REACTIONS DUE TO PROCHLORPERAZINE

Peculiar neuromuscular reactions of the dystonic type have been reported as infrequent side-effects of prochlorperazine therapy. This so-called extrapyramidal syndrome presents a frightening experience to the patient and a diagnostic challenge for the physician. Four such episodes were observed in Newport Hospital in the years 1958-1959.

Prochlorperazine has been widely used as an effective antiemetic and ataractic agent. Although this drug is a halogenated phenothiazine derivative, serious side-effects have been infrequent. In 1957, reports began to appear in the European literature describing an acute dyskinetic neuromuscular syndrome in patients treated with large doses of prochlorperazine.

As in our cases, the acute motility disturbance induced by prochlorperazine may be quite alarming and potentially dangerous. Marked cyanosis due to respiratory distress occurred in two cases. In O'Hara's series, two patients dislocated their jaws. If these reactions are not promptly recognized, serious diagnostic and therapeutic errors are possible. The psychologic impact of these episodes should not be minimized. All of our patients were extremely fearful of a recurrence of their attacks. Although these reactions are usually associated with high dosage of the drug (over 60 mg. per day), our experience indicates that they may be induced with small or moderate doses early in the course of the treatment.

The time element seems to be important. The reactions occurred within one to three days after institution of therapy. Twice we observed the considerable interval of 24 hours or more between the last dose of the drug and the onset of the attack. The reactions were strikingly similar, with a bizarre sequence of motor abnormalities. The patients were always fully oriented, but frightened. Eye movements suggestive of oculogyric crises were noted, and grotesque distortion of the face, trismus, a protruding tongue, opisthotonos, and extensor rigidity of the extremities occurred. Difficulty in swallowing and impairment of speech were prominent manifestations. The length of such an attack varied from a few seconds to one hour.

Although the onset seemed sudden, tightening and pain in the neck and facial muscles, together with "thick" speech, preceded the attack in one case for at least three hours. The importance of these complaints as premonitory symptoms of an impending reaction was recognized only in retrospect. The development of such symptoms should be watched for closely in patients receiving prochlorperazine. If they are noted, the drug should be omitted or the dosage reduced. The differential diagnostic possibilities considered included hysterical reaction, catatonic schizophrenia, cerebrovascular accident, tetanus and strychnine poisoning.

All of these episodes were promptly controlled with sedation. In our experience, amytobarbital sodium given intravenously or intramuscularly appeared to be satisfactory. Drugs used in the treatment of Parkinson's disease have been recommended, but their action seems to be too slow. Administration of caffeine has also been suggested. The prognosis appears to be good, with no ill-effects persisting after recovery from these reactions.—(*Annals of Internal Medicine*, March 1960).

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PROBLEM OF POST-CHOLECYSTECTOMY PAIN*

It occasionally happens that, after cholecystectomy, a patient suffers from temporary, or permanent attacks of colicky pains in the abdomen, much the same as those which led to the operation.

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1. *Temporary* post-cholecystectomy pains, however, disappear in a few weeks or a few months, and are due to:—(a) a mild obstruction in the common bile-duct caused by gall stone debris which may have been massaged into the duct during the operation; or (b) to blood clots or mucous or inflammatory products. As a rule such obstruction clears up during convalescence and requires no treatment.

2. *Permanent* post-cholecystectomy pains may be due to:—(a) an incomplete cholecystectomy—when for instance a small stone is left in the Hartmann's pouch giving rise to painful dyspepsia after cholecystectomy; (b) a stone which has been missed in the ducts of the liver or in the common duct; (c) hepatitis or cholangitis—giving rise to a very definite and recognizable syndrome and constitutional symptoms like rigor, fever, increased pulse-rate, and mild variable jaundice; (d) a stricture which may follow the cholecystectomy in which the cystic duct had been divided too close to the common duct; (e) a spasm of the choledochoduodenal sphincter (sphincter of Oddi). After meals the patient may experience colicky pain, and no apparent cause may be discovered on operation. The common duct will perhaps be found dilated. In these cases it is likely that the pains are due to a spasm (or an achalasia) of the sphincter of Oddi. It is possible that the cholecystectomy has disorganized the autonomic innervation of this sphincter and has upset its rhythmic emptying action. It has been found that the spasm is decreased by the administration of papaverine, scopolamine or amyl nitrite, and increased by morphia. Nyggard of Oslo reported a case of cholecystectomy in a woman which was followed by post-cholecystectomy colic in which morphia or opium always brought on the colic—a clinical observation which is compatible with the experimental fact that morphia causes contraction of the sphincter of Oddi. Mirizzi of Cordoba in Argentina found that persistent pain after cholecystectomy is generally due to the distention of the bile ducts from functional or anatomical obstruction at the sphincter of Oddi. In some cases there is a powerful contraction of the hepatic duct. (f) adhesions; it is not uncommon for dyspepsia to follow a cholecystectomy, specially when unskilfully performed and

*Specially contributed to the ANTISEPTIC.

[823]

leading to adhesions. This dyspepsia may be either *painless* or *painful*, according to its causation, and in some cases it may have a reflex origin. The *painless* type of dyspepsia, which sometimes comes on after a cholecystectomy may be caused by adhesions of the duodenum and the prepyloric part of the stomach to the sutured peritoneum over the area from which the gall-bladder was removed. In such cases, the adhesions are usually not firm and cartilagenous, and are therefore of the mild type, so that the dyspepsia is usually of the *painless* type. It may, however, be very intractable and not amenable to treatment. The *painful* type of dyspepsia following a cholecystectomy may be caused by firm cartilagenous adhesions of the first and second part of the duodenum to the bare surface of the liver which is left when the gall bladder has been removed, and over which the peritoneum has not been properly sutured. In such cases, a partial mechanical duodenal obstruction may be caused by the kinking of the duodenum due to firm adhesions to the liver. In this case the patient may vomit large quantities of gastric contents. In the less severe adhesions of this type, nausea, caused by the continuous pull on the duodenum by the heavy liver, and pain an hour or two after meals probably caused by hampered duodenal peristaltic efforts, may be features of a dyspepsia following cholecystectomy.

Fortunately, dyspepsia following cholecystectomy is now-a-days of less frequent occurrence, because, in the modern technique of the removal of the gall-bladder, great stress is laid on the necessity for carefully peritonealizing the gall-bladder-bed; (g) chronic pancreatitis associated with the gall bladder which may keep on the pains after cholecystectomy; (h) recurrence of calculi in the biliary ducts which may be responsible for the recurrence of symptoms; (i) unrecognized malignant disease which should always be kept in mind; (j) common spinal segment—as the gall bladder and the stomach are innervated from the same spinal segments i.e. the 7th, 8th and 9th, it follows that in reflex painful dyspepsia arising from gall bladder disease, epigastric pain—the pain of the inflamed gall bladder itself—will have the same distribution as that arising from disease of the stomach. As the epigastric pain also may vary with the intake of food, painful dyspepsia due to gall-bladder disease sometimes greatly resembles that caused by chronic gastric or duodenal ulcer; (k) Eliason and North of Philadelphia, found that the failures after cholecystectomy fall into two equal groups:—(i) In the one, no gross evidence of gall-bladder disease is found, the real trouble no doubt lying elsewhere and (ii) in the other group, gall stones had to be removed, but probably they were “silent” and the real source of the pain was not discovered.

Management of post-cholecystectomy pain.—Prophylaxis forms the most important part. Always leave a clear common duct to avoid post-cholecystectomy troubles; special care must be taken not to overlook any condition that would cause obstruction in the common bile-duct; besides palpation and scooping, the duct should be irrigated with saline and ‘vacuum-cleaned’ with an aspirator; remember that the stones in the common duct can slip upwards into the dilated liver ducts and that a small flat stone may be overlooked; it is also surprising to find how often common duct stones are unexpectedly present. Between 1938 and 1944 a total of 909 cases were operated for gall bladder disease in the Lahey clinic, of which 444 (48.8%) were subjected to common duct exploration and 128 (14.1%) of these had common duct stones.

Attention has been called to an additional aid in making certain that the main bile ducts are free of disease. At the conclusion of cholecystectomy, bile may be aspirated from the common bile duct with a hypodermic needle. If sediment, detritus or dark bile is found, common duct disease may be present. Under such circumstances, this may have resulted from forcing gall bladder bile or sediment through the cystic duct into the common duct. The normal bile in the common duct is light yellow and lacks the concentrated dark colour of the gall bladder bile. Sediment or sand may be the only indication of common duct stone. Without question some patients have symptoms because of partial reflux into the lower end of the common duct with resultant infection, or have concentration of bile in the duct with the formation of sediment, detritus or “mud”. In these cases the common duct should be explored and cleared, and this is most effectively done by irrigation and lavage.

A further preventive measure, whenever suspicious circumstances make it necessary to open the common duct, is to dilate the sphincter of Oddi. Probably the basis of this measure is the same as dilatation in cardiospasm. Also a complete peritonealization of the gall bladder bed must be effected.

OPERATIVE AND OTHER TREATMENT.—Where a common duct is being drained:—First make a cholangiogram by injecting lipiodal through the bile fistula or the drainage tube. An overlooked stone or a stricture may then be visualized on X-ray for which a secondary operation may be needed.

If no obstructive cause is found then therapy can be instituted through an in-dwelling drainage tube and the duct washed out with olive oil or saline. Local instillation of antibiotics may be made if necessary.

Where the common duct has not been drained:—Treatment should be instituted to try to relieve a possible dyskinesia of the

sphincter of Oddi. According to Best, 1/100 gr. nitroglycerine should be given by mouth three times on the first day; 1/100 gr. atropine injection on the second day; and 1/100 gr. nitroglycerine three times on the third day.

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ISONIAZID PREVENTS TUBERCULOUS MENINGITIS

Prior to the advent of chemotherapy, when either primary tuberculosis or one of its complications appeared in a child, there was nothing specific the attending physician could do to change the progress of the disease. If the complication happened to be meningitis or miliary tuberculosis, the results were nearly always fatal. After the drug isoniazid was developed, both primary tuberculosis and its complications could be treated, but, because the complications had sometimes progressed before the case was brought to the physician's attention, the threat of permanent disability or death still existed. Now it has been shown that practically all complications of primary tuberculosis can be prevented by administering isoniazid to infants and young children who are tuberculin positive.

Pamplona and Jones of the U. S. Department of Health, Education, and Welfare, Washington, D.C., have demonstrated by a controlled study that isoniazid is effective in preventing complications of primary tuberculosis in children. All infants under 1 year of age who react to the tuberculin test, and all children from 1 to 4 years of age who have, in addition, X-ray evidence of primary tuberculosis, should be given 5 mg. of isoniazid per kilogram of body weight every day for one year.

Prior to the advent of INH, to ask the practising physician to look for tuberculin reactors among children less than 4 years old may have been unrealistic. With the knowledge available today this is no longer the case—the practitioner now has a real opportunity to prevent a serious medical problem.—(G.P., 21: 4, April 1960).

COMPLICATIONS CAUSED BY HORMONES

At a meeting of the French Society of Gynecology, C. Beclerc reported the occurrence of acute abdominal complications in 25 women ranging in age from 13 to 25 years who were given excessive doses (10,000 to 13,000 units) of chorionic gonadotropin for sterility or amenorrhoea. Laparotomy in all these patients revealed a large amount of blood-stained fluid in the peritoneal cavity and large tumours of the ovaries, some of which had ruptured. Microscopic examination of the specimens revealed large hæmorrhagical luteal cysts.—(J.A.M.A., 23-4-1960).

THE PROBLEMS OF MACHINE INJURIES
OF THE HAND*

INTRODUCTION.—With the progress in industrialization in our country after independence, the occurrence of injuries of the hand has assumed great importance. Thus, wounds of the hand constitute about 40 per cent of all industrial accidents. Injuries to the hand if not properly managed in time, result in wound infection and often lead to permanent disability. The hand is the most important tool of the manual worker. When disabled and crippled, the worker suffers physically, mentally, socially and financially because he is deprived in part or whole of the function of this important instrument of livelihood for him. The prevention, treatment and rehabilitation of these crippling injuries and disabilities therefore, constitute an important problem to the medical profession. Finally, the doctor has to furnish an unbiased medical certificate about the total or partial, temporary or permanent loss of function of the injured part as a result of the accident so as to help the employer or the insurance company to award suitable compensation to the worker in accordance with the Workmen's Compensation Act.

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Prevention of injuries.—The prevention of injuries to the hand due to machines, is of paramount importance in the interest of the worker, the employer and the insurance company. "For every accident there is either an unsafe personal act or a special mechanical hazard, or both" (Heinrich). An analysis of the records shows that 88% of accidents are from unsafe acts. Prevention consists in training and disciplining the workers to eliminate these acts, and in guarding machinery against mechanical hazards.

AVOIDING UNSAFE ACTS:—(1) The worker should be educated, trained and disciplined about the safe use of the machines and must be compelled to observe all precautions.

The employer has the right to direct how the work should be done, and he should enforce the use of safe methods; (2) mental twists in the worker, like bravado, stubbornness, over-confidence, carelessness and craziness need strict control; (3) factors contributing to unsafe acts such as fatigue, late hours, slackness in morale, insufficient or glary lighting, insanitary conditions, inefficient supervision should all be corrected; (4) repeaters and the constitutionally unfit should be placed in safer jobs and (5) medical and aptitude tests of the workers before employment and periodically thereafter are essential.

*Specially contributed to the ANTISEPTIC.

Error in carrying out the above is classed as "man-failure" and is up to the management to avoid.

GUARDING MACHINERY:—Heinrich classifies this safeguard as follows:—(a) Designing and constructing tools so that guards are not required. Machines are built with their working parts inside them; (b) providing enclosures, covers and barricades: these guards should cover all moving parts and the point of operation; (c) providing mechanical feeding devices: mechanical feeders and removers eliminate injuries to the hands at the points of operation such as saws and presses; (d) providing devices that prevent or interrupt the movement of tools when the operator's hands are in the danger zone: These include levers, restraining cords to wrist, or the electric eye, which stop the machinery on encroachment of hands. Danger signs on the machines should be conspicuous wherever necessary; (e) providing remote-control operating mechanisms and (f) providing mechanical devices that remove the hands from the danger zone, such as cords which pull on the wrists, levers that throw the hands aside or that intervene between them and the work. To keep hands out of danger some machines are designed with a two-hand control.

PROTECTION OF HANDS:—(1) Hands can be protected from rough or sharp objects, hot metals or glass, barbed wire, electric current, chemicals and corrosives by the use of special gloves suited to each purpose.

[*Caution:*—Gloves should never be used around moving machinery as they catch and draw in. Gloves with metal attachments should not be worn, near about electric appliances. Gloves used for electricity (rubber and leather) must be regularly inspected for the presence of holes.]

(2) Protective creams or pastes rubbed on hands before work help to keep chemicals from working into the skin or to form a mechanical protective coating.

(3) Keeping the hands clean during work helps in decreasing the incidence of infection after injuries. Periodic sterilization of frequently reused liquids, like oils also helps to prevent infection.

TREATMENT:—The treatment of injuries to the hand starts with 'First aid' and is not complete until maximum rehabilitation has been secured. The best results are obtained if adequate measures are adopted to avoid contamination, prevent infection, help primary healing of wounds without scar and contracture-formation, preventing hæmatoma, clot formation, ischæmia, congestion and œdema of the injured hand, ensuring good circulation, proper splintage and elevation to ensure rest to the hand, hospitalization if the patient needs rest, maintenance of position of function and avoiding stiffness and deformity by early movements and physiotherapy.

GENERAL PRINCIPLES which when strictly observed, contribute largely to the success of the treatment are:—(1) The first care and correct treatment of the wound is the most important factor in the success of all further treatment, and in this the doctor must know how much he can and must do, as well as how little he should do. In other words, he must realize his obligations and limitations under the given circumstances of a first aid room, casualty theatre or a well-equipped operation theatre.

(2) Primary healing is absolutely essential to achieve satisfactory end results. Clean-cut wounds receiving treatment within the optimum time-limit respond well to primary reconstructive measures. Crushed and badly-mangled tissues withstand operation poorly and so a minimum of reconstruction and interference alone is permissible in such cases at the first sitting.

(3) Operative technique demands the maximum respect for tissues. In the words of Buff, the surgeon must guard every single cell from trauma.

(4) There must be the minimum of sacrifice of the tissue of the hand. While there is no tissue to spare, no nonviable tissue should be left behind.

(5) Avoid scar-tissue-formation by excluding factors, like hæmorrhage, œdema, sepsis, foreign bodies, dead tissues, tissue damage due to chemical irritants and operative trauma itself, in order to get good functional results.

(6) Personal attention to minor details is imperative, and includes details and methods of making incisions, applying sutures and ligatures, using fine instruments and proper suture material, co-apting tendon ends, setting fractures, reducing dislocation, repairing nerves, raising and applying skin grafts, handling the tissues with greatest gentleness, having patience to secure adequate hæmostasis and attention to every detail of dressing and after-care.

(7) The surgeon undertaking operative surgery of the hand should be interested in his work. Surgeons who are not psychologically fitted for this type of intricate and time-consuming surgery should not attempt it; surgery of the hand like all reconstructive surgery is definitely not for the surgeon in a hurry, as it demands considerable devotion, patience and endurance in the operator.

FIRST-AID:—The purpose of first-aid is to control bleeding and prevent further contamination of the wound. It also includes reassurance to the patient and measures to relieve him of any pain and prevent shock when the injury is of a severe nature. The wound should be simply covered at once by a sterile dressing if available or a clean piece of freshly washed cloth. This dressing should be bulky and bandaged on firmly in order to control

bleeding. An injection of morphine sulph or pethidine hydrochloride if available, is very helpful in relieving pain and allaying fears. The hand should be splinted if possible in the position of function and the patient immediately sent to a hospital where operative care can be had.

Emergency room.—Many factories or near-by civil dispensaries are provided with well-equipped emergency room. Minor injuries (superficial abrasions, lacerations or cuts) can be satisfactorily treated in this room provided full aseptic technique is followed. Prophylactic A.T. serum should be injected as a routine before sending the patient home.

Major injuries and those involving damage to the deeper structures such as nerves and tendons should always be dealt with in a well-equipped operation theatre by a team well qualified and trained for this type of work.

Case study.—The operating surgeon must study the case thoroughly before starting treatment. The history of the injury, a local examination of the wound and a general examination of the patient are really important. The cause and the place of accident, the time elapsed since injury, the type of first aid received, the nature and extent of injury are very important points to be ascertained. History of A.T. serum administration and antibiotic therapy and whether the patient is on empty stomach or has had his meal within the preceding few hours, or is drunk, are all very essential points to know for further administration of drugs and for giving general anaesthesia to the patient.

Local inspection of the wound under aseptic precautions will give the surgeon an idea of the nature and extent of the injury and whether the patient will need skin grafts or flaps. Diagnosis of nerve and tendon division is made by noting the movements and position of the fingers, and by testing sensation with cotton pledgets. Fractures and dislocations are similarly looked for, and in the majority of cases an X-ray of the part should be obtained, even if fractures seem unlikely. The patient should be examined also for evidence of any other injuries which demand priority in care, and for shock which needs immediate remedial measures.

Finally the surgeon must 'size-up' the patient noting his age, general condition and psychologic make-up. In the meantime he should reassure the patient, win his confidence, get his co-operation and willingness in order to obtain satisfactory results.

Time-factor between accident and operation.—All open wounds are contaminated, but before the contamination changes to active infection, we can convert the injured part into a clean surgical wound by surgically cleaning and removing contami-

nated and traumatized tissue from the wound and then perform primary closure of the wound after repairing the damaged tissues, if circumstances permit. This interval of time limit is between 6 to 8 hours on the average, and is a good working rule in institutional work. Wounds are however, so variable in the extent of tissue-damage, permeation with foreign bodies, the amount of infection and the virulence of the infecting organisms, that the time limit is always to be judged by individual circumstances and merits. In a badly crushed and torn wound, primary repair of the deeper structures may be dangerous even if the patient is brought for treatment immediately after the injury. Dirt-ground crushed wounds and infected-bite-wounds should never be closed primarily, while a clean incised wound with minimal contamination and little or no tissue-damage can be fairly safely closed even as late as 12 to 24 hours. Beyond this extreme limit, the chances are in favour of gross infection.

CHEMOTHERAPY:—The best time for primary operative repair may possibly be extended by the use of antibiotics and sulpha-drugs; but undue reliance must not be placed on them, and surgery must be performed in time with due regard to other factors influencing the time-limit (*vide supra*).

Antibiotics do not give a short-cut to proper surgical care, though they may serve as useful adjuncts and added factors in preventing and combating infection pre- and post-operatively in cases where the tissues have been exposed to prolonged operations and where bones and joints have been involved and tendon or nerve repair has been necessary.

OPERATIVE TREATMENT:—*Anaesthesia*:—The hands and fingers are very sensitive to pain and some form of anaesthesia is essential. Local anaesthesia is safe for clean fresh wounds. Nerve-block or brachial-block anaesthesia is employed for larger wounds in certain hospitals. But I am in favour of general anaesthesia for such cases, as the surgeon can then work more extensively and with greater ease.

Tourniquet:—A bloodless field is essential for careful operative surgery of the hand. After wrapping the limb in a towel an Esmarch bandage is used to exsanguine it and a blood-pressure cuff is used on the upper arm to maintain a pressure of 300 mm. of mercury. For a digit a catheter will suffice. The cuff may be safely allowed to remain inflated for 1½ to 2 hours or even longer before deflating it. When the main dissection has been completed the cuff is deflated, the part is encouraged to bleed with the aid of warm moist compresses, all bleeding points ligated, haemostasis ensured, and the cuff is again inflated. It is finally deflated after the wound has been closed and compression dressing and splintage have been applied.

Cleansing of the operative area and the wound:—Cleansing aims at conversion of the injured part into a clean surgical wound and is best accomplished by washing with soap and water. (1) First cover the wound with sterile dressings, shave the forearm and the hand, clean and clip the nails; (2) clean the hand and forearm thoroughly and carefully with soap and water taking as long as ten to fifteen minutes or more till the parts become as clean as the surgeon's hands. Rinse these parts now in clean running water; (3) remove the dressings from the wound and then with a fresh wash set-up, thoroughly cleanse the wound with soap and water removing all dirt and foreign material. Irrigate the wound profusely with normal saline solution and (4) finally the hand and forearm are swabbed clean with cetavlon lotion and are draped. The surgeon now gets ready for the operation, using cap, mask, gown and fresh gloves.

Excision and debridement.—Early excision of the wound is the best prophylaxis for infection including tetanus and gas-gangrene. This is the first step in the operation and involves removal of all nonviable tissues. In clean-cut wounds excision may be minimum since there is little devitalization of the tissues. In the contused and lacerated wound, excision may have to be extensive. The principle that there should be a minimum of sacrifice of the tissue of the hand must be strictly observed. The skin must be excised carefully since we have to save all we can for final closure of the wound. Obviously lifeless badly crushed flaps must however be excised, because they will serve no useful purpose. Doubtful flaps may be watched for their circulation after release of the blood-pressure cuff, and may be saved if the circulation seems to be adequate.

Muscle excision is seldom extensive in the hand. Obviously lifeless muscle should alone be removed. Tendon and nerve excision must be kept at a minimum, unless the digits they supply are themselves avascular or gone. Bone is not sacrificed unless it has lost all connection with the soft tissues. Amputation of fingers is performed only when the affected part has become badly crushed and avascular and not otherwise. All viable skin from a finger to be amputated should be retained to be used later in closure. Throughout the process of debridement the wound should be repeatedly and thoroughly irrigated, rinsed and swabbed with warm normal saline to keep it moist and to wash out all blood clots and debris.

Repair and exploration.—After a thorough cleansing and excision the surgeon must decide how much reconstruction is indicated and permissible. Primary reconstructive surgery should never be undertaken in the following circumstances:—(1) in badly crushed and torn wounds; (2) if the time elapsed

indicates a likelihood of established infection; (3) if the general condition of the patient or more urgent injuries of the other parts necessitate curtailment of time; (4) if the surgeon does not find himself equal to the job and (5) if operating facilities are inadequate.

In this connection it is well to know that a badly repaired hand may be almost irreparably ruined, while an injured hand closed primarily after thorough cleansing and excision and without any repairs, then allowed to heal by first intention in position of function may be reopened in three to six weeks and repair carried out with almost as good chances of restoration of function as would obtain with skilled primary repair.

Repairs to nerves and tendons should be made following set principles. Accessory incisions may be made to locate them if adequate exposure is not possible through the original wound. All agree that digital nerves should be repaired primarily except in the presence of infection. For ulnar and median nerves when primary suture is made expertly, the regeneration is sooner or better than that obtained after late repair (Lipscomb). The repair of the flexor tendons in the digital sheath presents a special problem and should be left for later repairs. Primary repair of divided flexor tendons in the palm, carpal tunnel, lower forearm, profundus tendon in the middle phalanx and divided flexor pollicis longus is indicated, provided other conditions are met. With extensor tendons the attitude is somewhat more liberal; it is possible to repair them in the presence of crush-injuries, if a satisfactory soft tissue covering for the repair area can be secured. Sometimes in infected cases simply splinting the part in a position to relax and approximate the divided extensor tendon will often secure satisfactory results.

Fractures should be reduced at the first operation and immobilized on a suitable splint in the position of function. Open joints must always be closed after thoroughly washing them out with normal saline.

Closure of the wound and skin-grafting.—Primary closure of the wound is of extreme importance and can be omitted only in late frankly infected and badly crushed cases. If the cleansed wound cannot be closed by simple approximation of its margins without tension, it must be closed by some method. Relaxation incisions, undermining the edges, split skin-grafts, rotation flaps from neighbouring area, cross finger flaps, saved viable skin from amputated parts, and the use of actual pedicle grafts from the abdomen or lower chest are the various alternative propositions, the application of one or more of which may help in the all-important objective of primary-closure of the cleansed and debrided wound in the hand.

Tendons, nerves, joints and bones cannot be left exposed to the outside and when infected cause sloughing, purulent arthritis, osteomyelitis, months of dressing, final crippling, permanent disability resulting in invalidism, compensation and waste of man power in industry.

These parts, being avascular, will not take a skin graft. They should therefore, be covered at once by rotation or pedicle flaps of the skin. The area so denuded may be covered by split skin grafts or sutured if possible without undue tension.

Dressing of the wound, splintage and sling.—*Dressing* :—The dressings are applied to provide a cover to the closed wound, a support to the grafted skin, enough compression to control capillary oozing, to aid venous return and lymphatic drainage thus avoiding swelling, œdema and venous congestion; it obliterates dead spaces discouraging accumulation of fluid in the tissues and it puts the tissues in their proper or normal relationship. If tied tightly, carelessly, and without a thought to its function, it may lead to ischæmia, disruption of the wound, lifting up of the skin grafts, œdema, and hæmatoma and may ultimately result in the ruin of a patiently and skilfully performed operation.

Application of dressings is therefore, a very important key-step in the management of the injured hand, and must always be attended to by the surgeon himself. It cannot and should not be left to the theatre Assistant, orderly or ward-boy. The following points should be kept in mind while dressing and bandaging the hand.

(1) The first covering of gauze must be nonsticky and should have a wide absorbent mesh. Sterilized vaseline gauze or Tulle gauze will serve the purpose best. Each finger must be dressed separately with gauze and its nail end kept exposed in order to enable the nursing staff to inspect them daily for circulation from time to time. Opposing skin surfaces must be separated to avoid maceration and every bony area must be covered to prevent pressure necrosis. Further layers of dry gauze should cover the vaseline gauze.

(2) Large pads of sterile cotton must be used as further layers of covering over the operation area so that compression is evenly applied and distributed over the whole area, not only just over the wound but also above and below it. A cotton ball applied to the palm helps to compress a wound in the palm, and also helps to keep the fingers resting in the semiflexed position of function at the metacarpophalangeal and the interphalangeal joints.

(3) When dressing is finished, and the part has been bandaged the surgeon should palpate it in all areas, and at all

places, and ensure that it presents the same uniform compressibility. There must be no area of constriction. A light bandage encourages venous congestion and œdema, a tight bandage results in ischæmia of the part. The dressing should therefore, be one giving uniform and judicious compression so as to regulate and ensure proper circulation in the hand.

Splinting :—The dressed hand must be put at rest in the position of function by applying a plaster slab coming well up in the forearm, moulding in conformity with the dressings of the hand and keeping the wrist and the finger joints in position of function as adopted in holding a rubber ball or a glass of water. When tendon repair has been performed this position may be altered so that the sutured tendon remains at rest without any tension during the post-operative period.

Releasing the tourniquet :—As soon as the compression-dressing and splint have been applied, the blood pressure cuff is deflated and removed. At this point the surgeon should maintain some additional compression in an elevated position of the hand for five or more minutes in order to combat the reactive hyperæmia which occurs at this time.

Elevation and sling :—If the patient is sent to bed the hand should be elevated on a pillow or sand-bag above heart level. When the patient is ambulant, say, next morning he is allowed up and a sling applied to keep the splinted hand in a condition of rest and elevation to promote healing and prevent venous congestion, œdema formation and stiffness. The sling must be maintained until the healing is complete. If for nothing else, a sling discourages at the later stages any involuntary use or accidental reinjury to the hand.

Badly traumatized wounds.—After cleansing and debridement, at the first sitting they should be loosely packed open, dressed with voluminous pressure dressing and kept elevated and undisturbed in position of function under penicillin umbrella. Secondary closure of these wounds is undertaken after 5 to 8 days, if conditions permit.

Late or infected wounds.—In these cases the wound should be laid open (incised), wide drainage established and necrotic tissues, when present, excised. The limb is splinted and elevated and chemotherapy started. A fracture should be gently set and dislocation reduced before dressing and splinting but other severed deep structures must be left alone. Secondary healing takes twice as long as primary healing, but open drainage ensures safety.

Closed injuries.—Fractures and dislocations are treated on general principles. Three to four weeks of rest in plaster is sufficient for clinical healing of fractures. Hæmatoma of the

dorsum of the hand absorbs. If an artery is lacerated in the palm or the wrist, the hæmatoma should be evacuated and vessel lighted on each side. In subungual hæmatoma shaving a hole in the nail gives instant relief. A pulp-space tight with hæmatoma should be opened to protect the phalangeal diaphysis from necrosis. Hæmatoma of the flexor tendon sheath leads to recovery after the initial phases of pain, swelling and loss of function.

Hospitalization.—General rest in a hospital conserves the total bodily energy for use in fighting infection and also aids the healing process. A few days spent in the hospital following the injury would greatly benefit the patient. Moreover he will be under the constant supervision of trained personnel, and he can have daily inspection of the dressed injured part and treatment with antibiotics; the response of his body to the injury can also be noted.

Post-operative care.—(1) Inspection of the wound is done in 4 to 5 days in order to detect any tight suture, infolding of the skin, displacement of grafts or any other minor detail which requires attention or readjustment. The dressings are then reapplied without interfering with the position of the hand; (2) stitches are removed after 8 to 10 days. The second dressing and splintage is also applied with the hand in position of function. In simple and minor wounds splintage is then discarded; (3) in case tendon or nerve suture has been applied the use of splint may be essential for 3 to 6 weeks depending on the nature of the repair work; (4) the patient is encouraged to use his hand, as soon as the wound has healed and no more dressings are required. Physiotherapy consists in directing the patient to move his fingers and the hand for 15 to 20 minutes, two to three times a day in warm soapy saline water. This encourages circulation and helps in the mobilization of the stiff joints.

Rehabilitation.—Most workers suffering from hand injuries fully recover the function of their hands or are only partially disabled so that they are able to resume their original work in the factory when the wounds have healed and the function has returned. Rehabilitation is required for those whose injuries have resulted in such severe disablement and crippling that they won't be able to return to their work in factories. The object of rehabilitation is two-fold. *Firstly* if the disability can be lessened by surgery and the hand made useful, the worker is helped to get this done. *Secondly* if the disability cannot be improved by surgery, the object of rehabilitation is to determine what vocation the worker is best fitted for, and then to arrange to provide the same to him. The factors involved in making this decision are education, training, mental test, experience, interest, choice, aptitude etc. Proper rehabilitation keeps up the *morale* of the workers by making them independent, secure

and useful to themselves their families and to the community at large. This is one of the important duties of an Industrialized Welfare State.

Compensation.—The employers or the insurance companies are liable to pay compensation in accordance with the Workmen's Compensation Act, if an injury is caused to a workman by any accident arising out of and in the course of his employment. The amount of compensation payable depends on the results from the injury *i.e.* whether temporary disablement, permanent partial or total disablement or death results from it and is proportionate to the loss of earning capacity resulting from the injury. Chapter II of The Workmen's Compensation Act, 1923, as modified up to the 1st December, 1959 explains the amount payable as compensation according to Schedule IV and Schedule I of the Act.

In addition to treating the injured and putting him back to work, the doctor's duties include the maintenance of records of the case, noting his progress, co-operation and attitude and furnishing an accurate and complete report assessing the function of the injured part unbiased by the exaggeration or the malingering of some workers. The workers should be encouraged to return to work early. This improves their *morale* and also the use of the hand, which cannot be fully accomplished by any passive therapy. The worker may start with light work and re-educate his hand till he is able to get back to his regular work.

The workers are often reluctant to return to work, sometimes due to the fear that if they are detected to be unfit for the job they might lose the job, but mostly due to the fear that the compensation may be shut off or their claim for disability may be jeopardized. The workers have a tendency to exploit a disability for easy living, they cherish and capitalize the disability until the case is settled.

The assessment of disability in a hand is based on the loss of its useful function. Anatomical loss of a part deprives the body of the function of that part. Loss of sensation and motion are also about equal in value and must be considered in deciding the fitness for work. Other factors to be considered are strength, speed endurance, pain, coordination and skill. Nutritional factors and vasomotor disturbance should be given due consideration but must not be stressed too much so long as the functional results are good.

In workmen's compensation an award for permanent disability is based on decreased earning power and is intended to tide over, until the man has adapted himself to his new environment. It is not compensation for loss of a part, though

it may be based on the loss of parts or functions. The doctor alone has the right to describe and assess the disability and the award is given according to the Workmen's Compensation Act in force.

Summary and conclusions.—Hands do the work for the workmen in factories and are therefore, liable to injuries of various kinds and degrees of severity. The industrialization of our country is rapidly advancing and with it the increased incidence of the injuries to the hand is a real challenge to the doctors working in industrial areas. This paper aims at acquainting the medical practitioners with the problems of prevention and treatment of the injuries to the hand, which have been dealt with in some detail. The questions of rehabilitation and compensation to the disabled worker have also been mentioned.

The importance of treatment of injuries to the hand so as to obtain the best possible functional results cannot be over-emphasized. Functioning of the hands is of vital importance to the manual worker for his very livelihood. It is hoped that the general principles of management of hand injuries as enunciated in this article will stimulate an abiding interest in the doctors who have to deal with such cases.

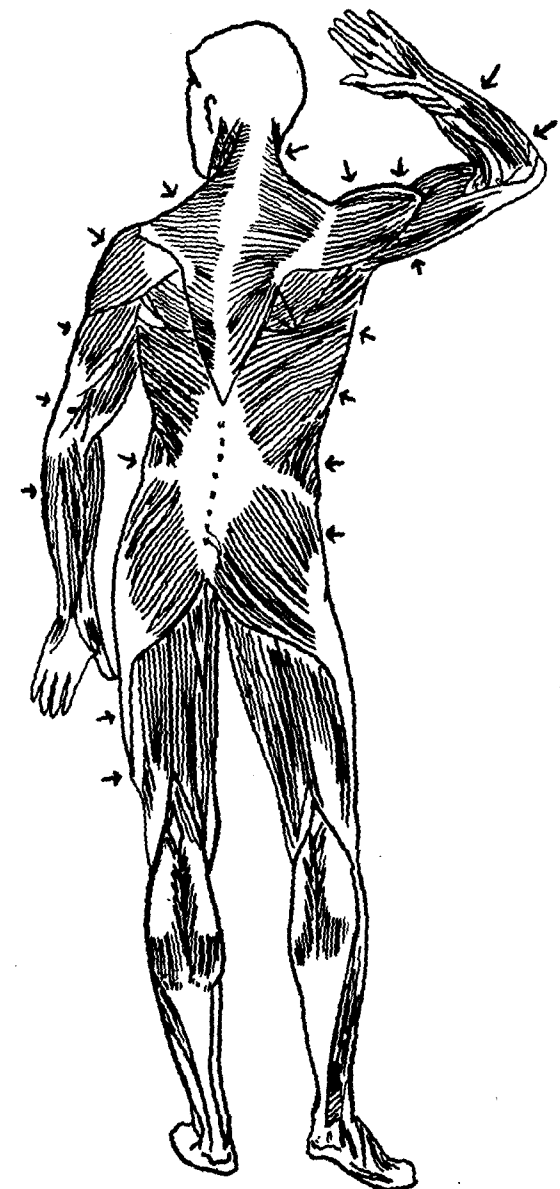
Surgery of the hand is not a difficult task, but requires patience, devotion and team work. Clarkson's Hand Clinic at Guy's Hospital, London is an excellent example of the usefulness of organized team-work. The devoted work of Bunnell, Furlong, Pulvertaft, Gillies, Kilner, McIndoe, Molem, Rank and others should serve well to arouse interest in this specialized field of surgery.

DIAGNOSTIC THORACOTOMY

The aetiology of a pleural effusion may continue to remain obscure in the face of recognized diagnostic laboratory procedure. Such studies on aspirated pleural fluid as bacteriologic culture, cell block for malignant cells, protein and enzyme determinations may show nothing abnormal. Bronchoscopy with aspiration-biopsy or transbronchial lymph node biopsy may shed light on the pattern or may provide no explanation. The same may be said for scalene lymph node biopsy.

The causes for pleural effusion are many, but in the older age-groups multiple aetiological factors may be present, particularly primary and metastatic malignancy, although 50% of patients with an idiopathic pleural effusion develop active pulmonary tuberculosis. The serious implications of the condition make accurate diagnosis a necessity. The authors therefore, recommend that when diagnosis is still obscure after all conventional laboratory and clinical examinations have been done, a diagnostic small thoracotomy with pleural biopsy be undertaken. Lansden and Falor employ a 6-to-8-inch incision through the sixth, seventh or eighth inter-space on the involved side, placing the incision in the most dependent portion of the chest compatible with the level of the effusion. This small incision allows introduction of the hand into the chest and the taking of an adequate biopsy, but it is still small enough to limit postoperative discomfort to a minimum. The incision may of course by extended should definite surgery be indicated at this time.

Pathologic diagnosis was obtained by this method in 17 consecutive patients. Seven were cases of postpneumonia effusion, six were carcinoma, one sarcoma, one lymphoma, and two patients were diagnosed as tuberculous pleural effusion.—(*J.A.M.A.*, 170: 1375, via *G.P.*, April 1960).



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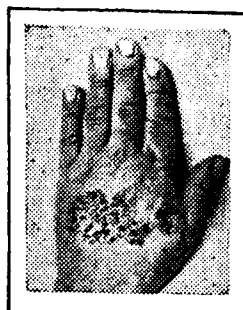
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MANAGEMENT OF ISOLATED CONVULSIONS IN CHILDREN*

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CONVULSIONS in children constitute a very important and interesting subject, often also perplexing to the doctor.

I propose to deal with this subject under three heads viz: (1) Common causes of convulsions in children; (2) important necessary examinations and investigations to be made, and (3) the treatment of isolated convulsions.

I. Causes of convulsion.—Any convulsion should be deemed to be a serious sign until the contrary is established by careful history-taking and diagnosis, and chronic epilepsy-condition is thereby also eliminated.

It is important to know that (i) simple febrile convulsion is a common cause of convulsions in children and occurs soon after an elevation of temperature; (ii) that convulsion may result from an intracranial condition:—(a) Infections due to bacteria, cocci, virus or parasites, (b) developmental diseases like cerebral aplasia, tuberous sclerosis, vascular anomalies and (c) degenerative diseases like Schilder's disease; (iii) from epilepsy—idiopathic or secondary due to toxic, traumatic, infective condition in the brain; (iv) breath-holding spasms precipitated by slight injury, minor provocation, violent crying etc.; (v) metabolic disorders like tetany, hypoglycæmia, cholæmia, uræmia etc.; (vi) drug intoxication by atropine, strychnine etc. and (vii) tetanus.

HISTORY-TAKING:—Age:—In infants less than a month old cerebral birth-injury. Kernicterus, and neonatal tetany may be considered; while in older children, acute infection and epilepsy may be thought of whether seizure occurred first, and if so was it associated with any elevation of temperature or recent injury; and also the character of the seizure; was it focal, suggestive of a local lesion though sometimes it may be found in patients without any defect in the brain.

PHYSICAL EXAMINATION COMPRISES:—(1) A complete neurological examination including Chvostek's sign, peroneal sign etc.; and (2) a general and other systemic examination of the throat, ear, nose etc. and the presence of adenoma sebæcum presumptive of tuberous sclerosis.

Investigations should include:—(1) fundoscopy—if choked discs suggest raised—intracranial tension; (2) blood examination: (a) if the normal values of serum calcium, phosphorus and phosphates are altered; if blood sugar is abnormal and if malarial parasites are present. Urine should be examined for

*Specially contributed to the ANTISEPTIC.

abnormalities; (3) if C.S.F. shows normal values for chlorides (650 to 750 mg.); proteins (30 to 40 mg.); sugar (45 to 80 mg.); and cells (0 to $8\frac{1}{4}$ mg.); (4) subdural tap:—when diagnosis of subdural hæmorrhage is considered, it should be suspected in a child, in whom a week or more after injury, there are complaints of vomiting, headache etc.; (5) electro-encephalography if and when diagnosis by routine investigations is not possible or is indefinite; (6) X-ray of skull for any abnormal calcification, asymmetry of bones and (7) pneumo-encephalography and cerebral angiography.

III. Treatment of isolated convulsions.—1. The child should be placed on a soft bed, tight clothing removed, and protected from injury during violent attacks. Guards should be placed on both sides of the bed to prevent the child from falling out. A padded tongue-depressor should be kept to prevent the tongue from being injured by the teeth. Face should be turned to one side to facilitate the free flow of mucus, saliva, etc. No pillows should be kept on the bed to prevent suffocation. Oxygen should be administered if child is found to be anoxic.

Termination of attack:—Anticonvulsive treatment should be instituted promptly. Diagnostic procedures, like spinal tap, should be postponed till the administration of anti-convulsive drugs. Drugs like calcium or glucose should be given only after specimens of blood are taken for examination, as otherwise they may mask the diagnosis of tetany or hypoglycæmia. In the event of severe protracted convulsions, it is better to give one large dose of phenobarbitone using the water-soluble powder available in ampoules containing 2 gr. to 5 gr., or sterile tablets available for injection. Morphia or opium should never be used as they are depressors to the respiratory and cough centres and may mask important diagnostic signs and symptoms; for control of high fever, cool sponges, ice-packs, ice enemas are useful. Lytic cocktails (mixtures of Phenergan, Largactil-Pethidin and saline) given intravenously have largely been reported to be useful in bringing down high fever.

2. Seconal sodium administered per rectum is sometimes useful and is available as $\frac{3}{4}$ gr. and $1\frac{1}{2}$ gr. capsules and 2 gr. suppositories. Capsule should be pricked to produce several pinholes and should be injected high into the rectum and the buttocks should be strapped with strips of adhesive plaster. If seizures do not stop 20 minutes after the administration of the recommended dose, ether or chloroform inhalation should be given unless the patient has acute respiratory disease.

Paraldehyde one to five cc. by injection is another valuable drug, the only objection being its smell hanging over for a long time. Fortunately most convulsions are of short duration and rarely endanger life directly.

Status epilepticus is a serious malady characterized by recurring major motor seizures between which the patient does not regain consciousness inspite of the usual anticonvulsive therapy. In unconscious patients, for the maintenance of fluid balance, glucose saline injection is necessary. If there is retention of urine, the bladder should be catheterized. Antibiotics should be administered to prevent secondary infections.

Once the attacks of convulsion are brought under control and the child is out of danger, proper treatment of the individual cause should be instituted promptly.

PAROMOMYCIN IN THE TREATMENT OF SHIGELLA AND SALMONELLA INFECTIONS IN CHILDREN

Coles *et al* of Queen Mary's Hospital for Children, Carshalton, Surrey, report the results obtained with a new antibiotic, *Paromomycin*. Paromomycin is an antibiotic derived from a strain of streptomycetes.

It is a white, water-soluble powder possessing bacteriostatic activity against various gram-negative organisms, including those of the shigella and salmonella groups. For our purposes, paromomycin was supplied as 'Humatin' by Parke Davis & Co., in a form suitable only for oral administration, by which route it is considered by the manufacturers to be free from significant toxicity in laboratory animals.

The clinical trial was carried out entirely in the gastroenteritis wards of our hospital. The following patients were included: 9 children aged 1 to 14 years with dysentery due to *Shigella sonnei*; 18 children aged 1 to 16 with symptomless infection by *Sh. sonnei*; 8 children aged 7 to 16½ years in the convalescent stages of infection by *S. paratyphi B*; 2 children aged 10 months to 8 years with symptomless infection by *S. typhimurium*. All these infections were proved bacteriologically by examinations of stools or faecal swabs before treatment.

Paromomycin, in a daily dosage of 40 mg. per lb. (80 mg. per kg.) body-weight was used in the treatment of shigella and salmonella infections.

In 8 out of 9 cases, and in 17 out of 18 carriers of Sonne infection, stools were bacteriologically negative after short courses of paromomycin. Five out of 10 excretors of salmonella, similarly treated, had negative stools. No serious toxic reactions or superinfections developed. Two re-isolated strains of *S. paratyphi B* showed partial drug-resistance.—(*The Lancet*, 30-4-1960).

CLINICAL EVALUATION OF THE ORAL HYPOGLYCÆMIC DRUGS

The oral hypoglycæmic agents should never be used simply because a patient does not wish to adhere to a diet. Both groups of drugs are of restricted value. The sulphonylureas usually control the mild elderly diabetic. The biguanides appear more powerful, but side-effects limit their usefulness. Neither group has the metabolic effects of insulin, and nobody knows what their long-term effects will be. The oral hypoglycæmic agents are thus useful and interesting, but they should be accepted with reservations and used with care.—(D. B. Stone *et al*, January 1960, *Journal of the Iowa State Medical Society*, 50: 19-23, via *Med. Dig.*, 5: 7, 1960).

A.C.T.H. AND ITS SIDE EFFECTS IN A CASE OF PAPILLITIS

THERE are many reports in the current literature on the use of corticotropin in the treatment of acute inflammatory lesions of the eye and on its side-effects. In treating inflammations of the posterior ocular segment, the method of administration is important. Smith (1953) reported a case of optic neuritis treated with ACTH given intravenously. Kazdan and Kennedy (1955) reported cases treated with ACTH and compared the results with another group treated with killed typhoid bacilli. Dhanda (1957) reported complete recovery with no side-effects in a case of non-specific idiopathic optic neuritis treated with ACTH given intramuscularly. The secondary effects of corticosteroid therapy can be grouped under two main headings: (i) metabolic which includes retention of sodium chloride and water; hypertension; hypopotassemia; abnormal fat-deposition; and osteoporosis; and (ii) psychic which includes insomnia; euphoria and changes in psychism.

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This paper records a case of papillitis which recovered completely when treated with ACTH and prednisolone, supplemented by streptopenicillin, B₁₂, B₁; the secondary effects of ACTH observed during treatment are also reported.

CASE REPORT:—Miss U., a 13-year-old-girl, suddenly developed headache on 1-10-'59, confined to the frontal region on the left side. She noticed a diminution of vision in the left eye on the next day and on the third day her vision was further reduced to a few feet. On 4-10-'59, she developed the same type of headache in the frontal region on the right side. On 5-10-'59, when the patient attended M. Y. Hospital, the visual acuity was restricted to finger-counting at about 1½ feet with both eyes. She was admitted immediately. There was no history of any previous attack of visual diminution or sinusitis or recent history of any disease.

On examination:—The cornea, conjunctiva, sclera, anterior chamber and iris were normal; pupillary reactions were not sustained; tension was normal to finger palpation; the media were clear; the edge of each disc was hazy and the surrounding retina oedematous; veins were engorged; and there was no hæmorrhages nor exudates. The vision was finger-counting at 1½ feet.

Laboratory investigations.—Urine was normal; W.B.C. was 8,100 per c.mm. with polymorphs 61 per cent, small monocytes

33 per cent, large monocytes 3 per cent, eosinophils 3 per cent. An X-ray picture of the skull was normal. On admission the patient weighed 61 lbs. and her B.P. was 110/65 mm. of Hg.

TREATMENT.—(1) ACTH was given intramuscularly in divided doses:—75 units in 24 hours for 3 days; 60 units in 24 hours for the next 4 days; and 40 units in 24 hours for the next 2 days. (2) Prednisolone tablets (5 mg. each) were given orally from the 9th day onwards—3 tablets in 24 hours for 3 days; 2 for the next 4 days; 1½ for the next 3 days; one tablet for the next 3 days and ½ tablet for the last 3 days. (3) Strepto-penicillin 1 g. was given for 10 days, intramuscularly. (4) Vitamin B₁₂, B₁, one cc. of each for 10 days, intramuscularly.

Comments.—The vision improved in a few days, gradually at first and then rapidly to 6/9. The response to the treatment was manifest on the third day, when the fundus picture almost became normal. The margins were clear; no oedema on retina and the veins were normal. Vision was finger-counting at 6 feet. On the eighth day her vision was 6/12 and on the 10th day her vision was 6/9.

The following secondary effects due to ACTH therapy were noticed:—

(1) **Hypertension:**—On admission the B.P. of the patient was 110/65 and her weight was 61 lbs.; on the 7th day of treatment with ACTH, there was a rise in her B.P., to 130/70. On the ninth day, it was 130/70 mm. Hg. but her face appeared puffy and the weight of the patient was 63 lbs. Then ACTH therapy was discontinued and the patient was maintained on prednisolone. The puffiness disappeared on the 2nd day and B.P. came down to normal on the 3rd day of stoppage of ACTH therapy.

(2) **Glycosuria:**—On admission and for the first two days her urine was normal. On the third day, a trace of sugar was found which continued till the ACTH was continued and for 2 days after stopping it.

(3) **Change in psychism:**—The patient behaved normally for the first five days, when called for examination. From the sixth day, she hesitated to come when called unless a nurse or a relative accompanied her. She would cry if left alone even for a few minutes. On enquiry from the staff, it was revealed that she objected to being left alone on her bed and generally sought company with a fellow patient or a nurse in the ward. The parents reported that she had never behaved like that before. Thus, there was a change in her psychism. *Firstly* the patient wanted company; and *secondly* she wept without any reason if left alone. This change in her behaviour disappeared four days after withdrawal of ACTH.

Conclusion.—Papillitis may be due to a variety of causes, and also the occurrence of sudden remissions is fairly frequent in this disease; no definite conclusions of value can be drawn as to how far ACTH contributed to the return of the patient's vision. The secondary effects of ACTH are not very common with the doses given. But the patient showed a rise in blood-pressure. On continuing, puffiness appeared, due to a retention of sodium chloride and water. Sugar was present in the morning sample of urine throughout the period of treatment. The change in psychism was pronounced. Her parents and our staff noticed the change and felt anxious about it.

Acknowledgement.—I am grateful to Prof. B. K. Dhir and Superintendent, Dr. R. B. Bhattacharya for according permission to me to report this case. I am thankful to Dr. Trivedi for his constant observation and follow-up of the case.

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ESOPHAGEAL VARICES

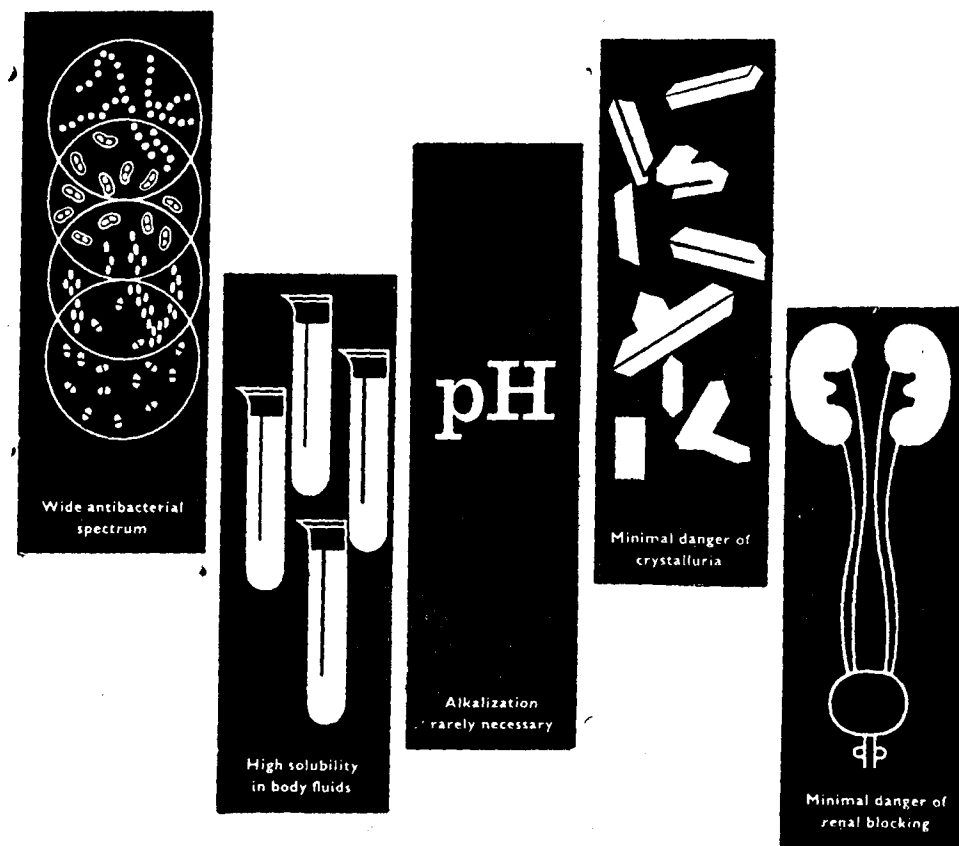
Oesophageal varices are dilated veins which are part of collateral pathways that develop secondarily to portal bed block. The portal hypertension is secondary to a variety of diseases of the liver. Hæmorrhage is the only symptom but this can be so massive that many patients die from the first hæmorrhage. Emergency treatment includes cardio-oesophageal tamponade by intragastric balloon and repeated blood transfusions. The preferred surgical treatment is a portacaval shunt.

Portacaval shunts may be done end-to-side or side-to-side. Although the portacaval shunt is larger, easier to perform and less likely to angulate, Linton prefers the end-to-side splenorenal, because of the lower mortality and lower morbidity (from neuronutritional disturbances). He also believes that the partial shunt obtained by the splenorenal method is better in the long run because there are fewer late deaths from liver disease. The operative mortality in all shunts is approximately the same and approaches 10% in experienced hands. After performance of such shunts there is a high incidence of peptic ulcer disease. A gastric secretory stimulant, which is normally metabolized in the liver, increases as more splanchnic blood by-passes the liver as the result of an effective surgical shunt.—(G.P., 21: 4, 1960).

SURGICAL HETERODOXY

Surgical heterodoxy is rife in operations on the stomach, for peptic ulceration is a very common disease, becoming commoner every year, and the claptrap and sales-talk of animal experimentation can be had for the asking, and can be served up to support any theory, however bizarre, and any operation, however unsound. Dozens of new operations have been propounded in the past few years by young men who have not yet shed their surgical milk-teeth. Some of them break all the canons of gastric physiology, repeat the errors of former failures, and have proved disastrous almost from the outset. But all of them have been publicized as epoch-making advances, and few of them have been apologized for. The failures are not known widely enough to prevent newcomers who have read the original articles trying the same thing again.—(Sir Heneage Ogilve, K.B.E., F.R.C.S., M.D. in "A Surgeon Looks at Life," 1959).

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Editorials

THE NATIONAL TUBERCULOSIS INSTITUTE OF INDIA, BANGALORE

(Will Evolve New Control Methods)

[NAUGURATING the National Tuberculosis Institute of India at 'Avalon' in Bangalore on Friday the 16th September 1960, Prime Minister NEHRUJI stressed the need for people's willing and whole-hearted co-operation in this new venture that aims at controlling the dire disease by methods best suited to this country. "When I heard the real purpose of this Institute," said the Prime Minister, "It struck me as something unique, something far more important than the institutions or hospitals engaged in treating the victims of tuberculosis..... Dr. MANI told us that what is attempted here is to treat the millions of patients without hospitalization. Obviously they have to adopt a new technique, some different strategy." It is therefore, essential to train people in the new methods envisaged by this National Institute, who would understand the new technique and carry it to others. Referring to the Community Development Projects which have been functioning usefully in the land already, NEHRUJI hoped that those engaged in control work at the new Institute would utilize to the fullest extent the services of that organization—not at the top but at the village-level, as only then would it be possible to achieve something worth having. Lt. Col. V. SRINIVASAN, the Director-General of Medical Services, stated that a sum of Rs. 12 crores had been set apart in the Third Five-Year Plan for combating tuberculosis. Doctors used to be considered only as curers of disease but they have lately been regarded as promoters of good health. In this latter sphere, they cannot function alone but need the help of numerous

devoted assistants and social workers. The functions of this Institute are, we are told, to train an adequate number of medical officers and ancillary workers and to carry on continuous research and study of the various problems that would necessarily arise in the course of implementing and executing the numerous schemes in the fight against tuberculosis. We in India have to be very grateful to the great assistance given in the control of many diseases that have been taking a heavy toll of precious human lives in our land for hundreds of years, by the WHO, UNICEF and other national and international organizations. The Government of Mysore has played an important role in the establishment and successful planning of the activities of this great Institute. Dr. P.V. BENJAMIN, Tuberculosis Adviser to the Government of India rightly stated that the inauguration of this National Institute was a very important landmark in the history of the T.B. control movement in India.

We have no doubt that quite a new idea underlies this method of control of an ubiquitous and serious malady. Its scope does not rest with the individual actually suffering from the disease, but extends much beyond and it is certainly a scheme designed for the control of this disease on a community-basis and for training suitable and loyal workers for this purpose. The Institute has therefore, embarked on what may, by many, be considered a departure from the time-honoured orthodox procedures. In effect, it would mean that cases will be searched out in the community by active and diligent inspection, interrogation and mass X-ray diagnosis when necessary and treated in their homes (domiciliary treatment as it has come to be known and practised now on more than a pilot-scale) and at the same time the different social and economic factors that govern the spread and control of the disease will be carefully studied by competent qualified persons. We believe this would also mean the education of the patient, his family and the public on these aspects. The requisite number of doctors and ancillary personnel will therefore, be recruited and trained to serve this end.

It follows from what has been said that the success of this great and noble Institution and its work will depend not a little on the human factor, amongst others equally important.

Clinical work, as we all know, attracts all medical men, but when it comes to a question of community programme for the control of tuberculosis or other such diseases, it becomes very difficult to get qualified doctors in adequate numbers to carry out the work, in which non-clinical aspects always loomed large and had often to be given priority.

It was indeed refreshing and also greatly comforting to be told by Dr. MANI, the Director of the WHO Regional Office for

S.E. Asia that the recent advances in medicine had made it possible to tackle several health problems in a remarkable way and they were available for exploitation. In Madras State, the WHO participated in a scheme with the Government of India in a research problem for the control of tuberculosis and it had been proved that the domiciliary treatment with modern drugs would be effective in the control of tuberculosis. The WHO esteemed it a great privilege to be associated with the work of the National Tuberculosis Institute and ten of their best staff have been engaged in the work of the Institute along with a band of devoted national workers.

Mr. T. G. DAVIES, Chief of UNICEF Area Office for India, Afghanistan and Ceylon, said that UNICEF was happy to make its joint contribution to the institute and its work. The success achieved in this Institute would have implications far beyond the shores of India.

That the tuberculosis problem (control, treatment and rehabilitation) has assumed considerable importance in recent years, is borne out by another novel and interesting experiment, "*The open air clinic*," that has been initiated for trial and study in five different centres in the Tanjore district. Presiding over a hostel-opening function on the 15th ultimo at Amritnagar near Tambaram T.B. Sanatorium (Madras), the State Health Minister Mr. M. A. MANICKAVELU, described the new scheme prepared by the Tanjore District T.B. Association, which has since received the blessings of the Union Ministry of Health in that they have approved of the establishment of five centres in the first instance. These will be located at places where there will not be many buildings except those required, for affording shelter at night for the patients, who will live in the open air all through the day. It is proposed to have a segregation centre (for about twenty patients) in or near a major panchayat area or thereabout. The patients are expected to be on a "self-diet basis." A paid health visitor and a paid servant will be employed to look after them. The patients will be sent to the T.B. Clinics periodically for treatment, advice and check-up. The capital cost of building, furniture etc. is expected to be about Rs. 5,000 and the recurring cost Rs. 1,800 per annum.

Originally, the scheme envisaged the setting up of 60 centres, 10 for each revenue division. But only five have been agreed to by the Centre. The Executive Committee of the State T.B. Association has already sent a cheque for a little over Rs. 21,300 to the Tanjore Collector in this regard. We shall watch the progress of this novel scheme with great interest.

DRUG CONTROL

(Amending Act Tightened)

THE amendment to the Drugs Act adopted by Parliament last month, seeks to tighten the control over the manufacture and sale of spurious drugs and drugs of sub-standard quality by enhancing the punishment for offences of this category and empowering the Central machinery to take cognizance of and detect them. It will be remembered that this important matter was the subject of heated discussion for quite a long time, in respect of its various aspects. The Union Health Minister has been consistently pleading for a whole-hearted co-operation from all the States. Since the enforcement of drugs control has been vested with the States and some of the States have not been taking this matter with sufficient seriousness, spurious and impure drugs manufactured in these States are finding their way into the adjoining States as well, constituting a serious menace to public health. The Bhatia Committee found in the course of their enquiries that some States have appointed Inspectors without the qualifications prescribed by the Government, though their work obviously requires specialized knowledge and training. During the debates in the Rajya Sabha early in August of this year on the subject of drug control, the discussion was concerned largely with the fancied encroachment by the Centre on the powers of the States and the Opposition had nothing useful to say on the far more important question of how best quality control could be enforced. The Union Health Minister was right in saying that enforcement measures could be carried out effectively only with the co-operation of the States, and in expressing his confidence that such co-operation would be forthcoming in full measure. It is as important to the health of the nation that drugs should be pure, as that food should be unadulterated; it is equally obvious that adulteration of both is being practised on a large scale.

There are about 125 large manufacturing units and some 2,000 small ones in the country, engaged in making a great variety of drugs and medicines. With imports almost completely stopped, the indigenous industry, either by itself or in collaboration with foreign associates, now operates in a wide field from which its more formidable overseas competitors have retired. The necessity is the greater, therefore, to ensure by the most stringent checks, that sub-standard products are not manufactured. The provision for Central machinery for the testing of drugs and overall enforcement can be of avail, only if the laboratories for testing are adequate in equipment and number. There is the Central Drugs Laboratory in Calcutta which finds its hands too full and the inevitable delays in sending samples to it from different parts of the country can be

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DRUG CONTROL—EDITORIAL

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avoided only if more of them, say at least six more to begin with, are established on a zonal basis.

With the passing of the Drugs (Amendment) Bill early in September, the Central Government will be in a better position to effectively control the drug manufacture and drug trade in India; for the Centre will, it is learnt have an inspectorate of its own for inspecting laboratories attached to the manufacturing and take samples of drugs and chemicals and this organization working in collaboration with the States Inspectorates must be able to put an effective stop to the pernicious and nefarious practices of unscrupulous persons who toy with the life and health of the people.

Shri D. P. KARMARKAR, the Union Health Minister, said that the amending bill had received the recommendations of the Central Council of Health Ministers and the Estimates Committee of the Lok Sabha and he assured that there will be no conflict of jurisdiction between the Centre and the States (as feared in certain quarters) in implementing the provisions of the Amended Act, which provides for a minimum punishment of one year's imprisonment and fine for the manufacture and sale of spurious and certain misbranded drugs.

While on this theme, we would like to observe that the penal provisions may be amended and modified so as to include the peremptory revoking of permits and licenses for manufacture and sale and to amend the imprisonment *and* fine clause suitably. This would serve to induce manufacturers to establish competent testing departments within their units to maintain standards. Pure drugs are so vital to life and health that the State should spare no pains nor relax its vigilance in the least to ensure such purity. Examination of recent samples (sent by State Governments) at the Central Drugs Laboratory is stated to have revealed the existence of impurities of the order of 10 to 15%. An intensification of the checks is thus urgently called for. Prosecutions should also be launched promptly with a view to deterring wrong-doers from persisting in so nefarious a trade.

Finally we would stress the importance and need for offering a sufficiently high scale of pay and allowance for the Inspectors in order that they may not yield to temptation and corruption by the wily kind of manufacturers. Also the strength of the Inspectorate must be increased and so adjusted that it should be possible for any Inspector to make surprise visits to all the factories and stores in his jurisdiction once a week or oftener and haul up delinquents without fear or favour.

The manufacturers on their part should welcome such visits and checks, if only to keep their staff in trim, without violating or neglecting the procedural techniques.

We learn that the Pharmacy Council of India which is to meet shortly in Cochin, proposes to bring home to the Health Ministers of States which have not made any progress, the imperative need for enforcing the provisions of the Pharmacy Act of 1948, as this relates to the appointment of qualified pharmacists in various capacities. They would also press for the institution of refresher courses for pharmacists of the 'D' group in order to improve their knowledge and keep them up-to-date in their work.

THE HOUSING PROBLEM AND THE NATION'S HEALTH

WE all know that determined attempts to solve the acute problem of housing-shortage have been and are being continually made in the public as well as the private sectors in order to promote the health of the people by relieving congestion and over-crowding and by doing away with slums. But there has been no significant diminution in the gravity of the problem. It is indeed a good thing to know that Authority has ceased to look at the problem with complacency. The Union Minister for Housing said recently that in spite of the expenditure of Rs. 500 crores in the public sector and thrice that sum in the private sector, housing shortage remains as acute as ever. Refusal to be little the magnitude of a problem is reasonable assurance, *per se*, that a commensurate effort will be made to overcome it, and it is from this point of view that the remarks of Sri R. VENKATARAMAN, Madras State Minister for Industries and Housing, on the present situation in this State are to be welcomed. He recognizes that the housing-shortage cannot be relieved overnight; he made no exaggerated claims regarding the Government's success in solving it. "All that the State Government had been trying to do," he said, "was to approach the problem in the right spirit" and to extend the necessary financial and other assistance to the extent possible consistent with the State's resources, and priority commitments.

We are told that the Madras State Government proposes to bring in legislation to set up a Housing Board to coordinate the activities of the various agencies. Such a Board was constituted in Bombay over 12 years ago, when Mr. GULZARILAL NANDA was Minister for Labour and Housing in that State; he said that the Board would take over from the Government the programme of housing from the stage it had reached then. We understand however, that the Board was not able to fulfil the hopes it had inspired. But this should not deter the Madras Government from going ahead with the proposed legislation. For do we not know that very often we stand to profit by the failures of others

and will be able to steer clear of the pitfalls they met with? But 'Board' or 'No Board' it is not the administrative side, but the financial help that greatly matters and so if adequate financial help is not forthcoming no scheme can succeed, particularly this one relating to the housing of millions of people.

In the matter of housing, expansion within urban limits has become next to impossible in all large cities and in almost every town in India at the present day, and instead slums grow like mushrooms only to add to the headache of the health authorities and to the detriment of the health of the slum dwellers and of the residents in proximal houses. Sri R. VENKATARAMAN, the State's Minister for Industries and Housing, referred to the unavailability of building sites within the City of Madras and outlined a really good, if ambitious, scheme for the development of Satellite towns. This and allied problems both in the city and mofussil are best dealt with by a statutory body, such as the Housing Board under way.

The building of satellite towns, townships and garden cities has been the subject of painstaking studies in all Western countries and much study and economic research will be needed for the planning of such towns. And as one of our distinguished contemporaries very properly pointed out the other day "it might be wise for the Madras State (or any State for that matter) to obtain the services of a good Town Planning Expert in this field from abroad through the Technical Co-operation Mission or the Colombo Plan. Such an expert, with a local staff of trained assistants and architects, will enable us to save a great deal of money by planning *new extensions on scientific lines*." It is indisputable that many co-operative housing societies and other such bodies have made serious errors in the past which are now difficult to rectify. Individuals who prefer to build their own houses have also to obey the municipal rules and regulations which have been often violated or carelessly neglected in the past. It may be worthwhile to provide prospective house builders with well-written pamphlets on the best modern methods of house-design, the use of new materials, and the basic rules relating to drainage and water-supply etc. Also the Building Research Station of the Government of India at Roorkee may be able to offer good guidance and helpful advice to our engineers and architects. We are certain that this would result in an avoidable waste of the country's resources.

Man is brought into surgery by a love of his fellowmen and a sincere wish to help them. As the years go by, experience will increase that love and, if he uses it right, will make his power of help more effective. But he must leave to others to judge in how far he has succeeded.—(Sir Heneage Ogilvie, F.R.C.S.).

GLEANINGS FROM THE MEDICAL PRESS

MEDICINE & THERAPEUTICS

Tubeless simple gastric analysis—(Desmold pill technique).—(*Armed Forces Med. Jour.*, July 1960).

Capt. Levere and Lt. Col. Palmer of the Second General Hospital, N. Y., have given a fair trial to the Desmold Pill Technique for tubeless gastric analysis and report positive results in 41 out of 42 patients attending the general wards of the hospital. The pill which approximately measures 0.5 cm. in diameter is a small hard ball of methylene blue wrapped in a thin rubber sheet and tied with plain catgut thin string. It is small enough to be easily swallowed with a sip of water. It dissolves in the presence of normal gastric secretions allowing the dye to be released, absorbed and excreted in the urine. Forty-two patients were selected from the general medical wards, some chosen at random and some because achlorhydria was suspected or known. Postgastrectomy patients were excluded because of the obvious difficulties in interpreting the results of conventional fractional analysis.

The patients were given a cup of black coffee at 7-30 a.m., while in the fasting state. One-half hour later the desmold pill was swallowed with a sip of water. The patients were then instructed to observe their urine closely for any colour change during the next 24 hours. If a colour change was observed, this was verified by the ward physician, and the time the specimen was voided was recorded.

On the following day a Levin tube was passed into the stomach and a fasting specimen of gastric juice obtained. Following caffeine stimulation, specimens, collected every 15 minutes for a 1-hour period, were analysed for hydrochloric acid (HCl). If the results of the desmold test and the fractional analysis did not agree, another pill was given at the time the Levin tube was withdrawn and the urine was observed for

an additional 24 hours. When administered to the 42 patients whose gastric juice contained free HCl in fasting specimen or after stimulation, the desmold test gave positive results in all but 1 patient. Of 9 patients with achlorhydria by gastric analysis, 6 also gave negative results with the desmold test.

The test seems to be a fairly reliable method of screening patients for achlorhydria and requires nothing more than the desmold pill and a cup of coffee. It is inexpensive and involves little effort. Development of urine colour in the laboratory, as in tubeless methods that utilize exchange resins, is not necessary, and the whole test can easily be accomplished by the patient while he is carrying out his normal activities. It would appear wise to have the test repeated if the initial one is negative, in order to increase the degree of accuracy.

Because there is practical need for a tubeless method of gastric analysis, the desmold test seems to deserve more extensive clinical trials.

G. Pohl-Boskamp, Hohenlockstedt/Holstein, Western Germany, supplied the Desmold-pillen (desmold pills) for this study.

Clinical evaluation of the oral hypoglycæmic drugs.—(*J. Iowa St. Med. Soc.*, Jan. 1960).

Three groups of drugs have been used clinically to reduce blood sugar in man:—insulin, the sulphonylureas and the biguanides. The medical literature abounds with reports of other hypoglycæmic agents. The current status of the effective, practical compounds that may be taken by mouth, first the sulphonylureas and second the biguanides is discussed and the properties of the oral hypoglycæmic agents are summarized below:—

Carbutamide or BZ 55 of the sulphonylurea group enhances insulin output and reduces hepatic synthesis or release of glucose. Its toxic effects are agranulocytosis and jaundice. This drug has been withdrawn in U.S.A.

Tolbutamide or Orinase of the sulphonylurea group enhances insulin output and reduces hepatic synthesis or release of glucose and has no toxic effect; only some gastrointestinal side-effects. It is available in the market. The maintenance dose is 0.5 to 1.5 gm. **Indications are:**—Adult-type diabetes of short duration and with moderate insulin requirements. **Contraindications are:**—(1) Juvenile diabetes, (2) presence of complications and (3) history of acidosis.

Chlorpropamide or Diabinese of the sulphonylurea group enhances insulin output and reduces hepatic synthesis or release of glucose. Rarely jaundice occurs. In only 5 to 10% gastrointestinal, skin, hypoglycæmia, and neurological side-effects. Available in the market. The maintenance dose is 200 to 750 mg. **Indications are:**—Adult-type diabetes of short duration and with moderate insulin requirements. **Contraindications are:**—(1) Juvenile diabetes, (2) presence of complications and (3) history of acidosis.

Phenethylbiguanide or DBI of the biguanide group increases peripheral uptake of glucose, accelerates anaerobic glycolysis and decreases hepatic gluconeogenesis. Never causes any jaundice; but 12% to 45% of gastrointestinal side effects. Available in the market. The maintenance dose is 50 to 200 mg. **Indications are:**—Adult-type diabetes. Use extremely cautiously in growth-onset diabetes.

The oral hypoglycæmic agents should never be used simply because a patient does not wish to adhere to a diet. Both groups of drugs are of restricted value. The sulphonylureas usually control the mild elderly diabetic. The biguanides appear more powerful, but side effects limit their usefulness. Neither group has the metabolic effects of insulin, and nobody knows what their long-term effects will be. The oral hypoglycæmic agents are thus useful and interesting, but they should be accepted with reservations and used with care.

Treatment of diabetic neuropathy.—(*Quely. Bull. N.V.M.S.*, July 1960).

The most important aspect of the treatment of patients with diabetic neuropathy is to maintain good diabetic control of the patient. This consists of an adequate diet, minimal glycosuria, fasting blood-sugar between 80 and 100 mg%, and freedom from insulin reactions. Although cases have been reported which responded well to oral hypoglycæmic agents, insulin is preferable because its effect is more certain and predictable.

Additional supplementary measures consist of salicylates and narcotics if necessary to control pain, cradles to prevent dyesthesias and pain from contact with the bed clothes, and bed rest in severe cases. In absence of peripheral vascular involvement, heat may at times be helpful.

Other measures consist of contrast baths, Burger's exercises, massage, and splints when necessary for foot drop. Thiamin and other B-vitamins may also prove beneficial in cases of diabetic neuropathy.

It has been Rundles' experience that the mild cases will require a few weeks, the moderately severe cases 6 to 12 months, and the severe cases 1 to 2 years. Residual neurologic signs may persist indefinitely. Most of the patients of the ischaemic group respond poorly to treatment of the diabetes.

OBSTETRICS & GYNÆCOLOGY

Primary carcinoma of the vulva.—(*J. Obstet. Gynaec. Brit. Emp.*, December 1959, via *Med. Jour. Aust.*, July 1960).

Stening and Elliott, review a personal series of 52 patients with primary carcinoma of the vulva treated by the senior author between 1950 and 1957 at the King George V Hospital, Sydney. The average age at onset was 68 years, the youngest patient being 40 years old and the eldest 92 years. Thirty-eight patients (76%) complained of pruritus vulvæ, present in some cases for up to 25 years. Nine presented

with a sore or lump, two on account of pain and three with bleeding and discharge. The microscopic appearance was that of squamous carcinoma. The pre-existing vulval disease in 74% of the cases was leukoplakia vulvæ (in 62% atypical epithelium was present, and in 12% there was lichen sclerosus *et* atrophicus). The triad of pruritus, leukoplakia and the epidermal type of the ulcerative form of squamous vulval carcinoma would appear to be a relatively frequent clinical entity in the elderly patient. The important link between the known symptoms (pruritus) and the unknown entity (carcinoma) is atypical epithelium. The authors state that it is as rational to submit the aged person with pruritus and external vulval manifestations to skin biopsy as it is to perform diagnostic curettage for post-menopausal bleeding. Clinically, atypical epithelium is regarded as dangerous and should be treated by excision (simple vulvectomy). The authors stress that leukoplakia is a clinical diagnosis only and kraurosis vulvæ should be discarded from the nomenclature. Skin biopsy is essential to establish the diagnosis.

Synchronous combined abdomino-vaginal hysterocolpectomy.—(*J. Obstet. Gynaec. Brit. Emp.*, April 1959, via *Med. Jour. Australia*, 30-7-1960).

J. Howkins reports a series of 50 patients with carcinoma of the cervix uteri treated by synchronous combined abdomino-vaginal hysterocolpectomy and assesses the scope, mortality and morbidity of the operation. All patients had invasive carcinoma of the cervix and no radiation therapy had been used either pre-operatively or post-operatively. The author considers this operation permits wider and better removal of the parametrium and paracolpos and is particularly advantageous for growths extending far down the vagina. The importance of teamwork, modern hospital facilities and skilled nursing is emphasized. The anæsthetic of choice is epidural block, since it affords moderate hypotension with minimal oozing and

contraction of the bowel. Abdominal dissection follows the classical Wertheim or Bonney operation, commencing around the common iliac vessels, proceeds down to expose the ureter, and clears the lateral pelvic wall to the levators ani muscles. Great caution is exercised when dissecting and ligating the branches of the hypogastric venous network. Two useful instruments employed by the author at this stage are a hæmostatic bulldog clamp for the common iliac artery and silver wire clips for venous oozing. The vaginal operator can be of great help in finding the tissue plane between the rectum and the vagina and avoiding injury to the terminal branches of the superior hæmorrhoidal arteries. The vaginal part of the operation follows Schauta's procedure, the whole mass of paracolpos and parametrium being separated from the lateral pelvic walls, the ureter being guarded by the abdominal surgeon. When the specimen is removed, hæmostasis is secured, and the cavity in the pelvis is lined with oiled silk into which gauze is packed. Important features of post-operative care include the following: the use of an indwelling catheter for three weeks; a mild oil aperient on the second or third day but no enemata; removal of the pelvic gauze pack and oiled silk under light anæsthesia after 48 hours. The author discusses urinary complications of this operation, of which there were 21 in this series. Ten of these were mild and transient, while 11 presented major problems.

Four patients had severe stress incontinence, five had loss of bladder sensation without incontinence, and two had recurrence of growth leading to fistulas. There was one operative death in the series, the result of air embolism during transfusion. The author considers this synchronous combined operation the most extensive yet devised for the removal of cancer of the cervix. The extensive removal of tissue which this operation permits is achieved at the risk of denervating the bladder, which may result in the urinary complications described.

Use of Premarin as a hæmostatic in vaginal surgery.—(*Qrly. Bull. NUMS.*, 34: 2, 1960).

Drs. Leon Carrow and Edward Jacobs of Chicago report on 39 cases of vaginal hysterectomy with anterior and posterior wall plastic repair. All 39 received a general anæsthetic.

A double blind technique was used to determine the effects of Premarin. At the onset of anæsthesia, either Premarin (20 mg.) or a placebo was injected intravenously. Surgery was begun some 15 minutes after injection. The identification of the substance injected was not known until all of the results regarding blood-loss had been compiled. It was ultimately ascertained that 20 patients had been given Premarin, and 19 a placebo. Of the 20 patients in the Premarin group, 12 were private patients operated on by ten surgeons. Eight service patients were operated upon by Chief Resident in gynaecology. In the placebo group, 12 were private patients operated on by 8 surgeons and 7 were service patients. The blood loss was measured by weighed sponges.

The range of blood-loss in the Premarin group was from 175 to 1050 cc. with an average blood loss of 515 cc. In the placebo group the range was 282 to 1640 cc. the average being 609.5 cc.

PÆDIATRICS

Paroxysmal atrial tachycardia and heart failure in infancy.—(*U.S. Armed Forces Med. Jour.*, June 1960).

Many infants dying of congestive heart failure have anatomic abnormalities of the heart, only a few of which are amenable to treatment. However, a significant number of infants in congestive heart failure may respond dramatically to treatment. Chief among the causes of heart failure in this group is supraventricular tachycardia. Swift recognition and treatment of supraventricular tachycardia may be lifesaving.

Although rest, oxygen, and diuretics are appropriate treatment if conges-

tive heart failure is present, rapid digitalization is the treatment of choice in supraventricular tachycardia at all times. Vagal stimulation and cholinergic drugs are not as effective or reliable in terminating paroxysmal tachycardia in infants as in older patients. An infant will rarely die of paroxysmal tachycardia less than 72 hours in duration; therefore, if the infant is seen early, digitalis should be given a full trial. Up to 1½ times the usual calculated digitalizing dose may be given in the first 24 to 36 hours.

The choice of digitalizing preparations may be dictated by the condition of the patient. Short-acting preparations are preferable in infants. The prognosis in digitalized patients is excellent.

Of the digitalis preparations available, Digoxin seems most ideal for paediatric use. Its virtues are the moderately rapid onset of its effect and its relatively short duration of action. Thus, dosage may be manipulated to attain maximal digitalization rapidly without hazard of prolonged toxicity. It is now generally conceded that the digitalizing dose of Digoxin ranges from 0.015 mg. to 0.04 mg per pound of body weight. In children 2 years of age or younger, adequate digitalization tends to occur at the higher dosage level. In early postnatal life, toxic reactions are common and a lower dose and less rapid digitalization are generally wise.

When digitalis fails to abort the tachycardia, methacholine, 0.2 to 0.3 mg. per kilogram given subcutaneously, or quinidine, 3 to 5 mg. per pound, may be resorted to. One should use careful, frequent electrocardiographic controls when administering methacholine, and an intravenous infusion should be running so that atropine can be given to counteract toxic effects of the drug without delay.

Aspirin and salicylamide suspension in paediatrics.—(*Am. J. Dis. Child.*, July 1960, via *J.A.M.A.*).

In a clinical study of 206 infants and children hospitalized for various

febrile conditions, it was found that salicylamide suspension had only minor antipyretic action. The effect of salicylamide was usually transient and poorly sustained, a small temperature drop of 1 to 1½ hours' duration being followed by a recurrence of fever. Aspirin, on the other hand, generally produced prompt and sustained antipyresis. A summary of the literature revealed no significant difference in acute toxicity of the 2 drugs toward laboratory animals. Since salicylamide is a poorer antipyretic than aspirin and offers no advantage in safety, there is no justification for substituting it for aspirin as an antipyretic.

Hirsutism in adolescent girls.—(*Am. J. Dis. Child.*, July 1960, via *J.A.M.A.*).

Two girls, 13, and 1 girl, 14, presented a rather unusual clinical picture characterized by hirsutism, obesity, mild enlargement of the clitoris, and menstrual irregularity. The urinary excretion of 17-ketosteroids, corticosteroids, and pregnanetriol was normal in each patient. Other studies failed to demonstrate evidence of altered adrenal cortical function. Abdominal exploration in each instance revealed the presence of polycystic ovaries characteristic of those described in patients with Stein-Leventhal syndrome.

Syndrome of recurrent (cyclic) vomiting—(a study of 44 children).—(*Paediatrics*, 25: 775-80, May 1960, via *Medical Digest*, July 1960).

The syndrome of recurrent (cyclic) vomiting has been called 'periodic vomiting,' 'acetonæmic vomiting,' and 'recurring vomiting with acetonæmia.' It is characterized by recurring prolonged attacks which may be accompanied by headache, abdominal pain, and fever.

Usually the onset is sudden, the child becomes drowsy and lethargic, while all food, and even water, may be vomited. An attack may last for hours or days, and the dehydration and loss of electrolytes usually causes hypochloræmic alkalosis.

Starvation ketosis is manifested by ketonuria.

Although spontaneous recovery is usual, the use of fluids intravenously may be necessary. Deaths from dehydration have occurred. Patients are usually symptom-free between attacks. In the 44 children under observation the attacks of recurrent vomiting first began before the age of six years. In all but one patient the episodes ended before the age of 14 years. Duration of symptoms ranged from two to 13 years with an average of 6 years. In 64% of the patients individual attacks lasted four days or less. Eighteen patients had three to five attacks per year. 21 had attacks every one to two months, and five patients had more than one attack per month.

Among the methods of treatment which were reported by parents of patients to have been successful, were phenobarbital, anticonvulsants, chlorpromazine, and antihistamines. Some attributed their children's improvement to removal of a normal appendix, osteopathic treatment or intensive prayer. One child was said to have recovered after an exploratory laparotomy with negative results; some were believed to have "grown out" of the attacks, and others were improved after visiting the clinic although they received no specific treatment.

No changes characteristic of convulsive disorder were found in the 15 children who had encephalograms. The success of widely different methods of treatment suggests that none were specific and that their value was largely psychotherapeutic.

Some of those children whose cyclic vomiting is associated with headache may fit the category of migraine. Of the 44 patients examined, 36% had associated headache, and of the 38 who were traced at follow-up 24% had recurrent headaches after the vomiting episodes ceased. Family history of migraine headache was obtained for 25% of the patients. Recurrent vomiting usually terminates before puberty. While the cause is possibly psychogenic, this is not known definitely.

DERMATOLOGY

Notes on the therapeutics of pemphigus foliaceus.—(*Hospital*, 57: 275-283, Feb. 1960, via *J.A.M.A.*, 18-6-'60).

Seven female patients treated on the Service of Pemphigus Foliaceus in Sao Paulo, Brazil, were selected for an experimental study of the effect of a combined corticosteroid-quinacrine therapy. The patients' ages ranged from 13 to 57 years, and the duration of the disease varied from 3 to 11 months. Dexamethasone acetate was administered in the dose of 4 mg. daily, except to a 13-year-old girl who received only 2 mg. In 2 patients, whose disease was in an early stage, the regression of the lesions was evident within 10 and 18 days respectively. In the other patients the dose of 4 mg. daily had to be maintained for 95 to 111 days before a visible regression was obtained. The patient who was receiving only 2 mg. daily did not improve until her dose was increased to 3 mg. After a regression had been definitely observed, the dosage of dexamethasone was gradually decreased to 3, 2, and 0.5 mg. daily, then replaced by quinacrine hydrochloride. The only side-effect observed during the treatment with dexamethasone was increased weight in 2 patients. Four patients suffered a relapse, and their lesions acquired a pustular aspect which subsided on the administration of penicillin. This suggests that a combined dexamethasone penicillin therapy might accelerate the involution of the lesions. The administration of quinacrine hydrochloride was effective in maintaining the improvement obtained with corticosteroid therapy, with the occurrence of only a slight eruption in some lesions.

Hormonal treatment of psoriasis in women.—(*Revista. Med. Santiago*, 88: 1, 78, 1960, via *J.A.M.A.*, June 1960).

Two aspects in the pathogenesis and therapy of psoriasis suggest the operation of a hormonal factor: (1)

the frequency of onset around puberty; (2) the fact that in 50% of women-patients the lesions disappear during pregnancy, although in about 15% the condition is aggravated during this period. Twelve women with generalized psoriasis of long duration, resistant to the usual treatment, were treated with progesterone given in intramuscular injections every 3 days, or in the form of subcutaneous pellets. Young patients received the drug during the 2nd phase of the menstrual cycle (200 to 300 mg.) for each cycle. Postmenopausal patients were treated continuously. The only other treatment given during this study was vaseline to alleviate excessive dryness of the skin. Four patients completed the treatment, having taken a total dose of 650 to 950 mg. of progesterone. The lesions disappeared completely in 3 of them, but remained unchanged in 1. Eight patients were still under treatment when this paper was written, gradual improvement being observed in 7. Clearing of the psoriasis lesions started within the first 7 to 10 days of treatment in some patients, although in most of them it became noticeable within 4 to 8 weeks.

Triamcinolone treatment of psoriasis.—(O. Lofferer and R. Plasun, (1959) *Derm. Wschr.*, 140: 750, via *Br. J. Dermat.*, July 1960).

Twenty-seven patients were treated, mostly severe and resistant cases. Initial, then daily dose was 16 to 32 mg. Other corticosteroids were almost uniformly unsuccessful. The authors suggest prolonged treatment with a daily maintenance dose of 4 to 8 mg. Residual lesions can then be treated in the usual manner.

Side effects after a few months were rounding or definite mooning of face, and insomnia in one patient. The treatment is recommended during severe episodes and in exudative cases and where large plaques predominate as well as in pustular psoriasis. Arthropathy improved as well.

REVIEWS OF BOOKS

A Hand Book of Tropical Diseases—

By J. C. BANERJEA and P. B. BHATTACHARYA, 6th edition thoroughly revised and re-edited with the assistance of Dr. L. K. GANGULI, and with contributions by Dr. R. N. CHAUDHURI, Dr. N. V. BHADURI, Dr. P. C. SEN GUPTA, Dr. A. MONDAL, Dr. L. K. GANGULI and Dr. J. B. CHATTERJEA. 515 pages. Published by The Academic Publishers, 11, Panchanan Ghosh Lane, Calcutta-9.

This book on Tropical Diseases written by the above wellknown authors has been revised and re-edited by Dr. L.K. Ganguli in its 6th edition. The contents of the book have been divided into 10 sections, each section dealing with the diseases caused by different types of organisms. Section 1 introduces the book. Section 2 gives a description of diseases caused by parasites. This has 2 sub-sections viz. (a) the description of protozoal diseases like amebiasis, giardiasis, malarial leishmaniasis etc., and (b) helminthic diseases. Section 3 deals with the

diseases caused by bacteria like typhoid, dysentery, cholera, leprosy, plague etc. Section 4 gives a description of diseases caused by spirochaetes. Section 5 deals with diseases due to Rickettsiae. These two sections provide interesting reading as a detailed description of these subjects is rarely found in books by Indian authors. The next chapter deals with the diseases caused by viruses like small-pox, chicken-pox etc. Section 7 deals with diseases due to vitamin deficiency like beri-beri, pellagra; Section 8 deals with the diseases caused by vegetable and animal poisons. Section 9 describes diseases due to physical agents like heat and sunlight; and Section 10 deals clearly with the diseases of unknown aetiology like Tropical splenomegaly and Tropical eosinophilia. The latter condition is usually neglected in text books on medicine. There is an appendix giving methods of Diagnosis of fevers in the tropics. The book is well brought out and has been neatly indexed and should be useful to all doctors.

NEWS AND NOTES

Bombay Eye Bank**Supply of Cornea: New York Offer**

The Buffalo Eye Bank and Research Association, New York, has informed the Government of Maharashtra that it is willing to provide cornea to the State Government when needed.

The Maharashtra Government has recently started an eye bank at the J. J. Hospitals, Bombay. The eye bank is the first of its kind in India. Plans were being drawn up to expand the eye bank to meet the growing demands of the people.

The Government would be shortly acquiring special equipment to preserve cornea for several months. At present corneas could be preserved only for three weeks.

More Powerful Penicillin

The recent British discovery of a new Penicillin capable of killing germs

that have proved resistant to ordinary Penicillin is hailed by the *British Medical Journal* as an "outstanding achievement" and an "important step forward."

Named *Celbenin* the new antibiotic, is now being made on a pilot-plant scale. Full-scale manufacture is to be undertaken at the Beecham Research Laboratories' factory which is now being built at Worthing Sussex.

Malaria Through Blood Transfusion

The case of a woman who caught malaria through a transfusion of blood which was from a Nigerian donor is described in the "*Lancet*."

Doctors were at first puzzled by the woman's symptoms because she had never been out of Britain.

Tests on the Nigerian did not, in the beginning, show any signs of the disease, but after 16 days of testing, parasites were found in his blood.

The journal said both the woman and the Nigerian were completely cured of the disease by the use of the drug Chloroquine phosphate.

Indigenous Medicine**New Madras College**

Madras State would have a modern college of indigenous medicine with post-graduate course in the next few years said Dr. P. M. Mehta of the Research Institute of Indigenous Medicine, Jamnagar, who is also the Chairman of the 5-man committee appointed by the Madras Government to advise it on setting up a college to teach Ayurveda, Siddha and Unani systems. The committee, which is expected to present its report in two to three months' time, would endeavour to see that the college proposed in this State would not only be a complete unit by itself with facilities for drug research, pharmacy and post-graduate courses, but would also serve as a model institute for the rest of India.

The next sitting of the committee will be held in Madras shortly.

Tuberculosis in West Bengal**Threefold Rise in Incidence**

The incidence of tuberculosis has increased three times since 1946 in West Bengal, the Governor, Miss Padmaja Nayudu, told the annual general meeting of the Bengal Tuberculosis Association on 22-8-1960.

Miss Nayudu, who was presiding over the meeting at Raj Bhavan, said the disease had assumed alarming proportions, and appealed for the earnest cooperation of all concerned to fight it.

She stressed the need for permanent arrangements to isolate incurable patients.

Earlier Dr. K. N. De, General Secretary of the Association, presenting the annual report said there were about 8,00,000 T.B. patients and only 3,400 beds for such patients in the State.

Executive of Dental Council Meets

At Bombay, The Executive Committee of the Dental Council of India, met on 22-8-1960. Col. N. N. Bery, President of the Council and Dental

Health Adviser to the Union Government presiding and approved the budget estimate of the Council for 1961-'62 amounting to Rs. 1,27,000.

The committee also considered and commended to the Union Ministry of Health, the report of Col. Bery, who had been invited by the Governments of West Germany and Austria to study the development of dental science as taught in their universities and to examine the facilities for post-graduate training of Indian dental graduates in other countries.

Lipsticks Harmful

Answering a question the Union Health Minister Mr. D. P. Karmarkar said the use of nylon fabrics, rubber shoes, and lipsticks caused skin diseases. He said research on this was being conducted in the Irwin Hospital, Delhi.

Asked whether in view of the doubts raised, the Minister would advise women not to use lipstick or nylons, Mr. Karmarkar said, "To all women who come to me for advice, I shall advise them not to use lipstick in any case. But about nylons, I have an open mind."

Government's present policy was to promote industrialization. But if damage to health would be caused by any particular industry, it would not hesitate to prohibit that industry.

Hospital Pharmacy**Model Scheme Formulated**

Mr. K. S. Srinivasavaradan, Professor of Pharmaceutics, Madras Medical College, addressing the Madras State Government Pharmacists' Conference, referred to the two categories of pharmacists, degree-holders and diploma-holders, and said the distinction was not rigid. The low scale of pay had kept away many degree-holders from hospital pharmacies.

The example of Vellore hospital should serve as a guide in that respect as they had a well-developed hospital pharmacy. The hospital pharmacist held a more important position in hospital administration. He requested the Health Minister and the Director of Medical Services

to consider this in the new schemes of medical administration. He hoped their service conditions would be improved soon.

Nuclear therapy in Indian Hospitals

The Defence Minister, Mr. V. K. Krishna Menon, stressed the need to spread knowledge of nuclear radiation medicine among the public and its increased use in Indian hospitals.

Inaugurating a radiation medicine (isotope) ward at the Military Hospital in Delhi Cantonment, on 2-9-'60 he said the country had now made a beginning in the use of atomic medicine. But the people at large still had certain inhibitions attached to the use of atomic material. "We have to cast away this inhibition to make progress in the field of modern medicine where nuclear therapy has come to stay." Although India would never have any use for nuclear weapons for war purposes, the time had come when people should have knowledge of atomic energy not only for medicinal purposes, but also to protect themselves in case of atomic warfare. The procedure to be adopted in such an event, he said, was very simple and this could be also taught to the public.

Mr. Menon said one of the problems in the atomic field was how to dispose of the waste. At one stage, it was thought that this could be dumped deep into the sea and it would have had its harmful effects somewhere else. The problem of disposal of atomic waste was as important as canalizing human energy. Indian scientists and doctors should study this. He appealed for the cooperation of the civil medical service with the army medical service in introducing the study of nuclear medicine in medical institutions in the country.

The Union Health Minister, Mr. D. P. Karmarkar, described the event of the opening of a well-planned radiation medicine centre as a "new chapter" in the field of medical relief. He had no doubt that in the next five years there would be many more such centres all over the country.

With the establishment of the atomic reactor in Bombay it has

now been possible in India to use radio-isotopes for diagnostic therapeutic purposes. Since last year the Research and Development Organization of the Ministry of Defence has been running a radio-isotope section at the Safdarjang Hospital in New Delhi. The isotopes are obtained from the atomic reactor in Bombay and are carefully handled by remote control tongs. They are stored in heavy lead vessels to avoid any radium flowing out.

Indian Nurses will Hear of Latest Medical Techniques

The 45th Annual Professional Nurses' and Midwives' Conference and Exhibition will be held in London from 10th October 1960, under the aegis of the *Nursing Mirror* and Indian nurses, doing postgraduate courses in Britain, will be among nurses from all over the world numbering over 12,000, who will hear some 25 of Britain's leading physicians and surgeons lecture to them on the latest advances in medical techniques.

The London Nursing Exhibition, to be held in conjunction with the conference, will have on display drugs, pharmaceuticals, hospital and nursing appliances, and nurses' uniforms.

Joint Annual Conference (1961)

The Joint Annual Conference of the various All India Medical Specialists' Association: The Association of Physicians of India, the Indian Association of Chest-diseases, the Cardiological Society of India, and the Neurological Society of India will be held at Madras in the 2nd week of January 1961.

An influential Reception Committee has been formed under the Chairmanship of Dr. R. Subramaniam. The conference will draw from all over India a large number of medical specialists to take part in the deliberations of the conference.

The reception committee invites the co-operation of the profession and the public.

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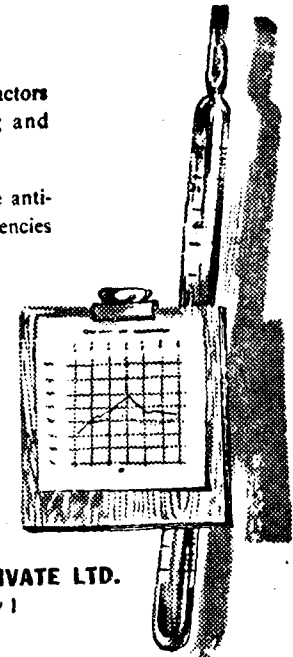
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I. Franklin et al., Jour. Am. Med. Assn. Nov. 14 1958, (1958).

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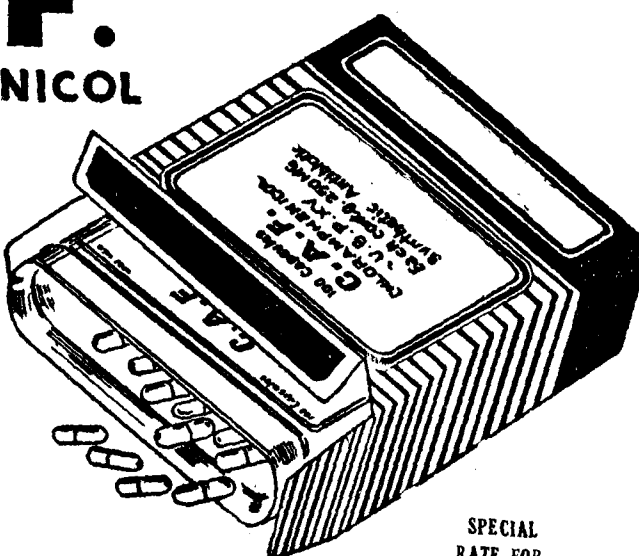
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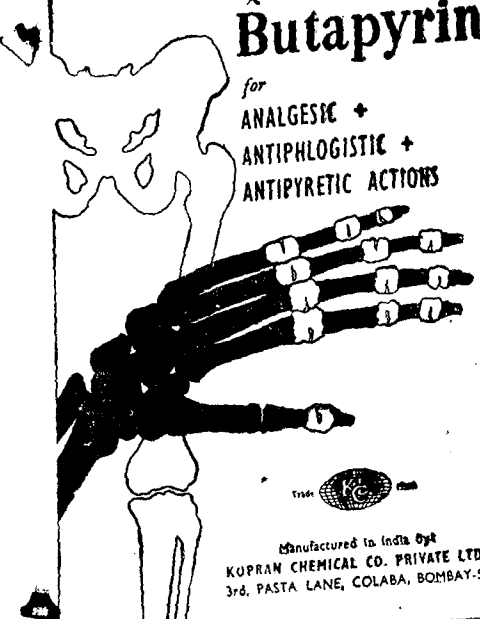
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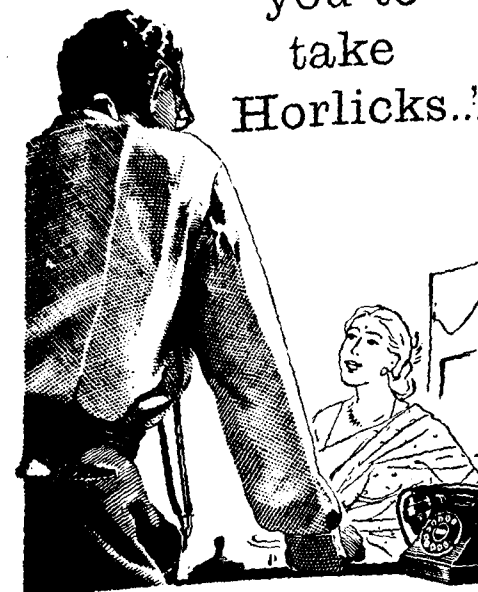
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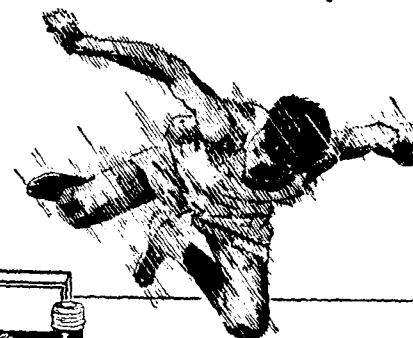
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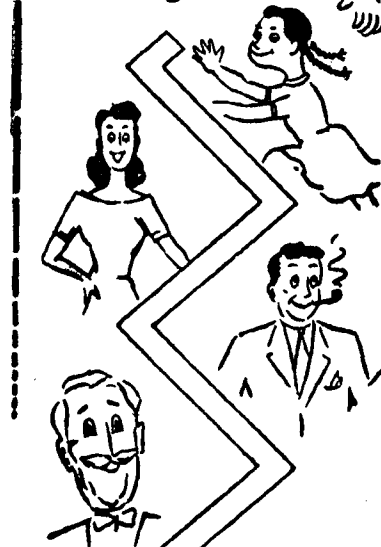
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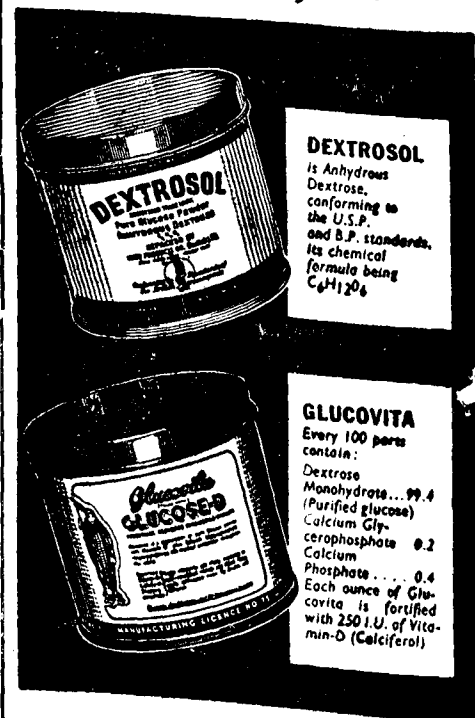
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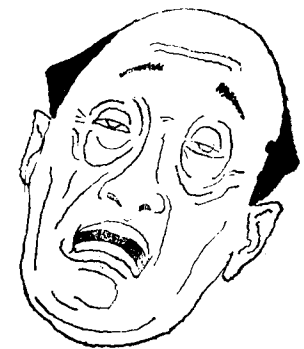


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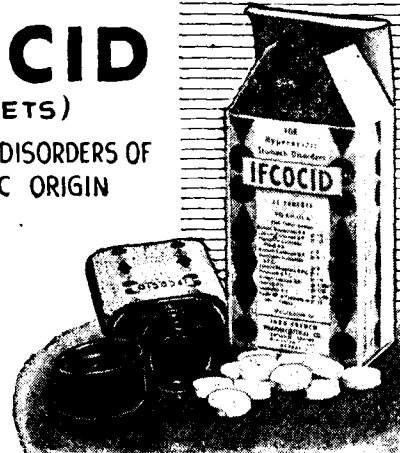
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Oct. '60]

THE ANTISEPTIC

[Vol. 57, No. 10]

U Z E X

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Vol. 57, No. 10]

THE ANTISEPTIC

[Oct. '60]

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	" Eng. 3-25 [Plastic 0-75	" " Curved 5" 1-50, SS 4-25	
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	Bistury curved 1/-, Folding 1-75	Stethoscope BD Type Ind. 7-75	
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	" Metal male 2/-, female 1/-	Snare Tonsil CP 6-50, Policaps 7-25	
	Curret Sharp & Blunt S.S. 8/-	Spirit Lamp Glass 1-25, Metal 2-0	
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	Corks assorted 1b 2-20	8x4x3 38-0 8x4x2 37-0 11x4x3 55-0	
	Cotton Absorbent 1-25	Saline Aparatus Comp 300cc 7-50	
	Cork Screw with Tin Cutter 1-25	Sanitary Towels 0-25	
	Doctor's Bag Leather 10" 15-87, 12" 20/-	Silk Hank 0-75, Slik worm Gut 1-25	
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	" Needles 1 doz. 1-75	Tongue Spatula Metal 1-0, Plastic 1-25	
	" Elevator 5-50, Tweezer 1-75	Test Tubes Doz. 1-0, Holder 1-25	
	Douche Can EI 2 Pt. 1-75, [3 Pt. 2/-, 4 Pt. 2-25	" " Stand 1-25	
	" Rubber Tubing 5' 0-50, 6' 0-75	Temperature Chart 100 Sheets 2-25	
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	Diagnostic Set with E.N.T. 35/-	Jap 2-25, Ger 2-75, USA 4-0, Zeal 5-37	
	Dilator set of 8 Instruments 25/-	Thermometer Flat 3-75	
	Dispensing Scale with weights Brass 3-62, Nickel 4-62	Tray with Cover 8x6 11x9 11x8	
	" Weights Dr. and Gr. 0-75	12x10 10-50, 7-25 9-50 9-0	
	" Glass Pen 0-50, Plastic 0-75	Tray without Cover 8x6 11x9 12x10	
	Director with Probe or Scoop 1/-	4-25 5-75 6-25	
	Dissection Box 13 Instrument [Ind. 16/-	Urinometer Ind 0-75 Ger 5-75 Zeal 7-50	
	Dressing Drum 4x4, 6x6 7x7, 9x9	Undine Glass 1-50, Polethene 2-0	
	16-50 22/- 28-50, 40/-	" " Aluminium Male 3-0	
	Doctor's Visiting Bag 10" 18/-	Vaginal Douche 7-50	
	[12" 24/- sq.	Wash Basin EI 28cm 1-87, 32cm 3-12	
	Oval 8" 7-50, 10" 9-75		

[87]

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Vol. 57, No. 11

Regd. No. 9, M. 429

NOVEMBER, 1960

The Antiseptic

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Page From 861 to 960

Contents on Matter p. 861-A

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The advertisement for Vitamulson is enclosed in a large, stylized frame. At the top center is a smiling sun with radiating lines. Below it, the word "VITAMULSON" is written in large, bold, serif capital letters. Underneath the name, in smaller capital letters, it says "CONTAINS ALL THE ESSENTIAL VITAMINS INCLUDING VITAMIN B12". At the bottom left of the frame is a small, fluffy dog looking up. On the right side of the frame, a young child in a striped dress stands with one hand on their cheek, looking towards the product name. The entire illustration is set against a background of small stars.

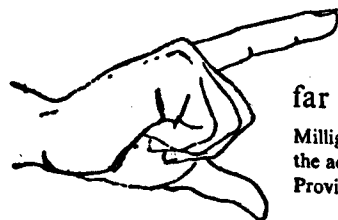
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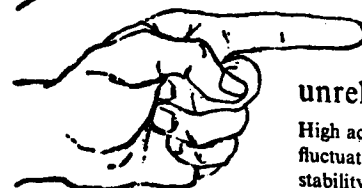
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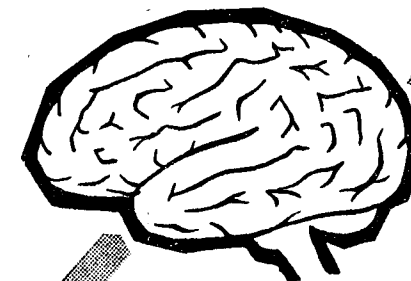
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THE ANTISEPTIC

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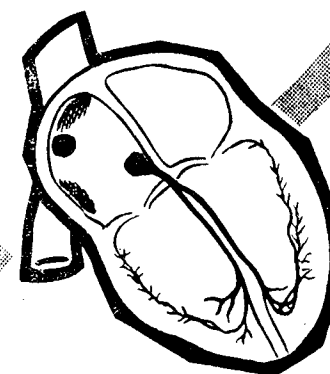


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[Nov. '60

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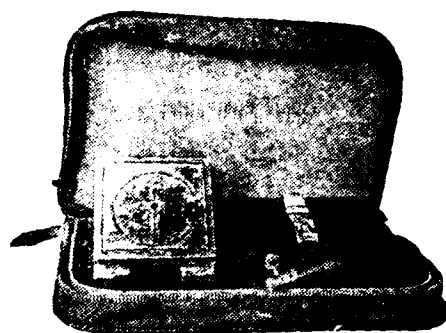


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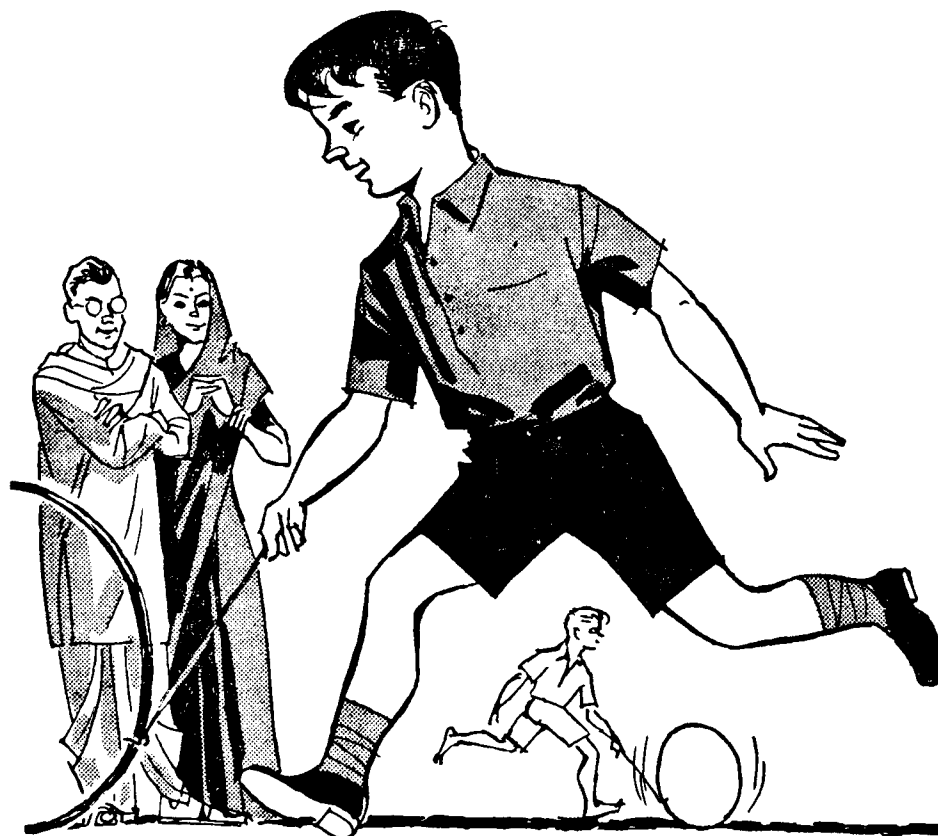


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- 5 Uniform blood levels
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Diabinese is supplied as 100 mg.
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in bottles of 30 and 100

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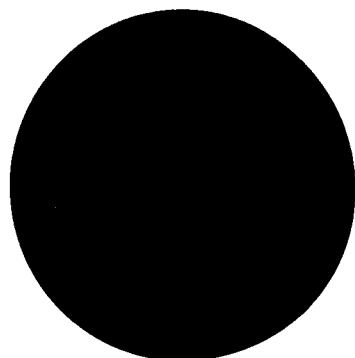
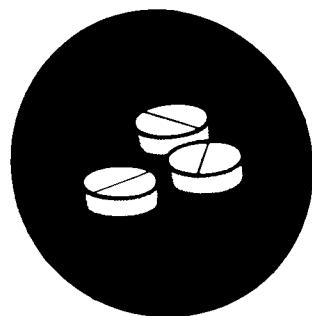


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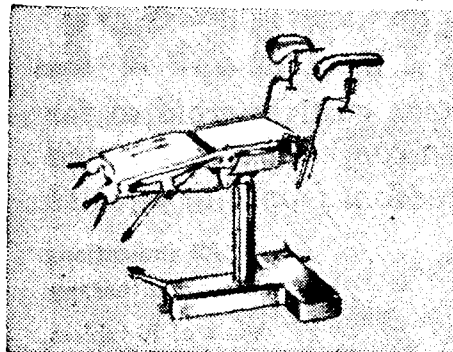
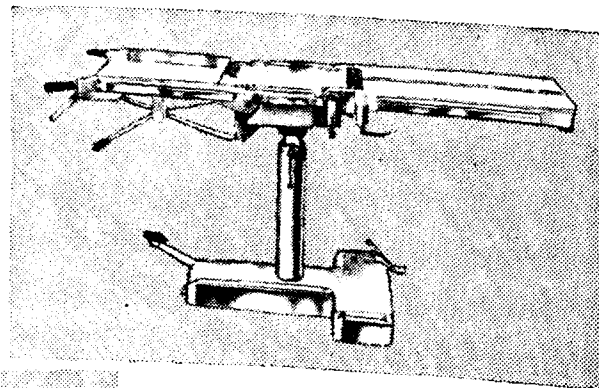


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The Maquet-Velox Operating Table combines engineering excellence with the needs of modern surgery. Instantaneous adjustment by head-end controls facilitate quick and easy movement and change of operating positions. The 4-section X-Ray penetrable table top permits the taking of X-Ray photographs even during the operation: in fact, radioscopy can be performed on back rest and leg plates.



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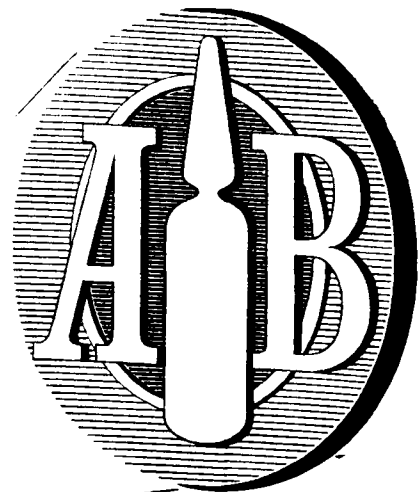
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PROMPT & EFFECTIVE REMEDY

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The judicious combination of the best known indigenous herbs and proved Western therapeutic agents makes Cheston the ideal remedy for relieving congestion, loosening and liquefying bronchial secretion, and promoting easy expectoration,

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4x0.5 G. tablets per day for 10 days usually effects a cure.
Entamide is available as 0.5 G. tablets in bottles of 20.

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EXPECTORANT



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- * alleviates congestion.
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LITERATURE ON APPLICATION

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NS8/495/H/IND

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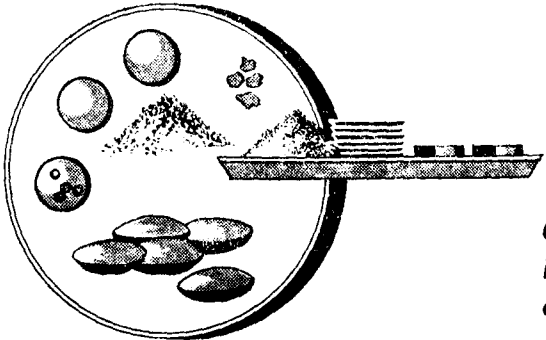
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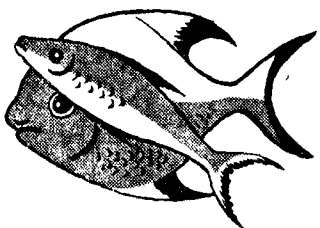
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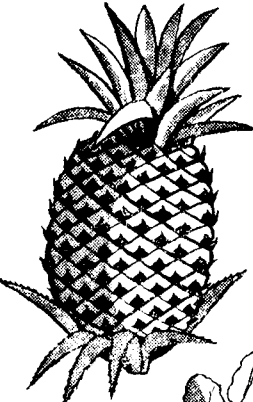
Opening new vistas in gastro-intestinal disorders

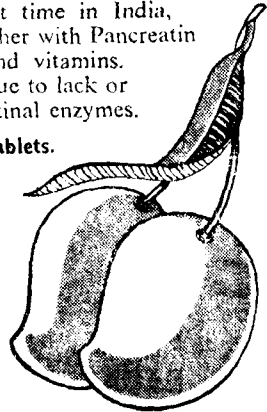




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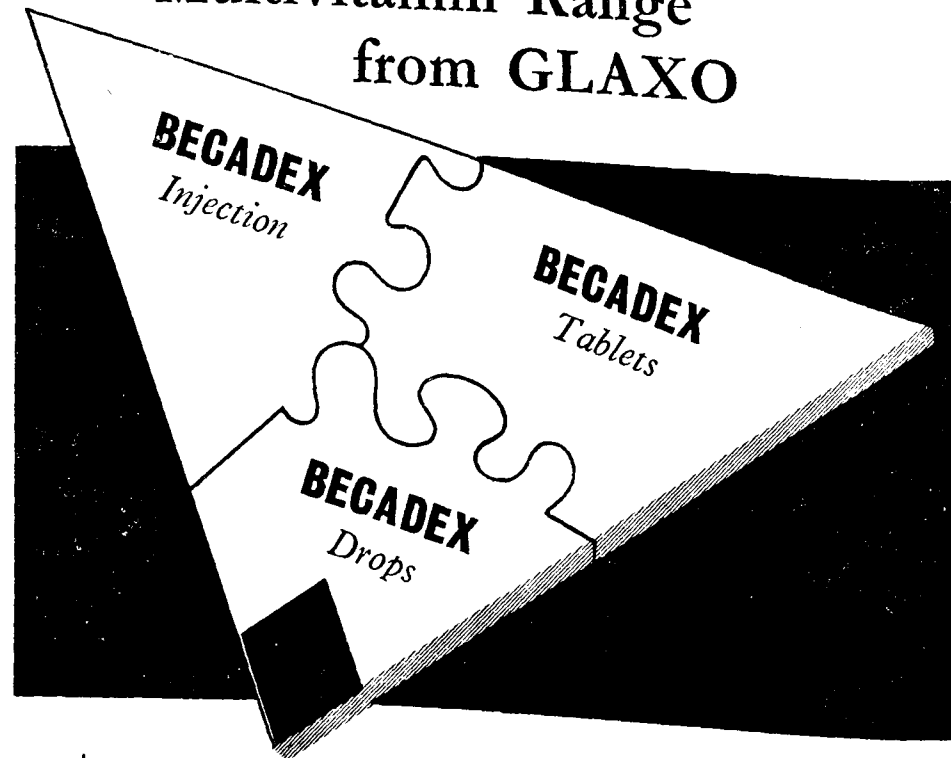




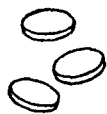
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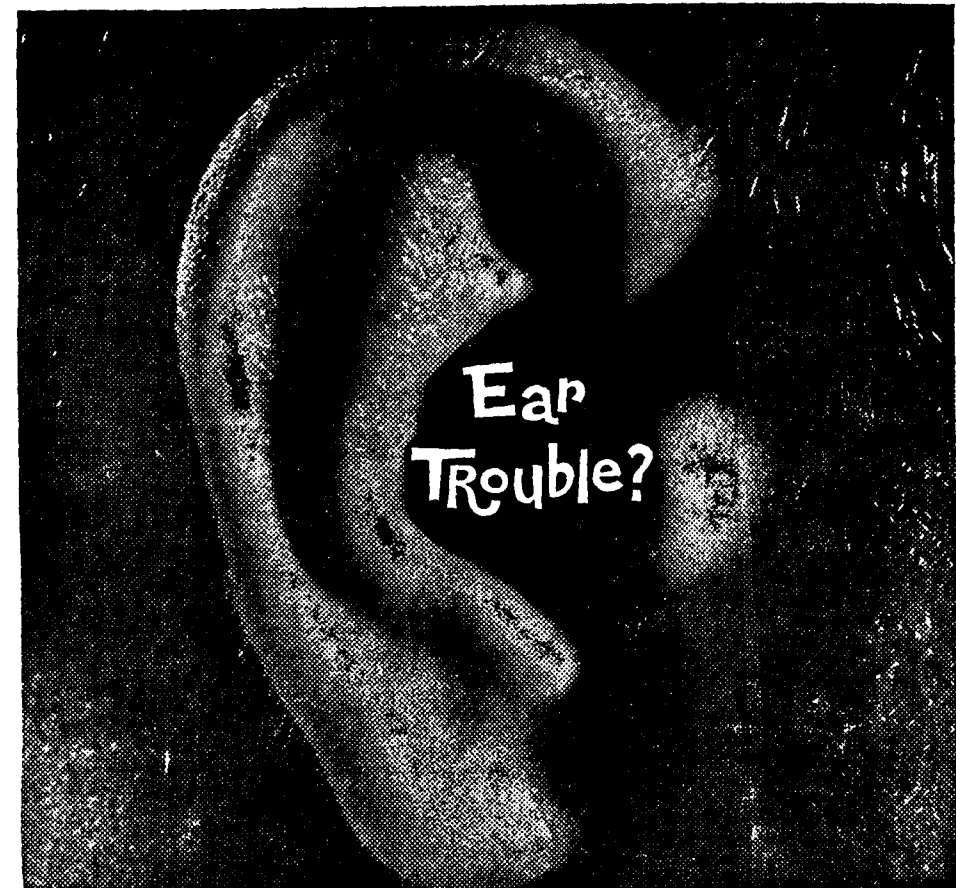
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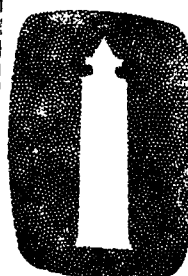
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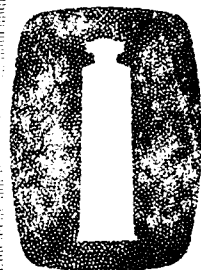
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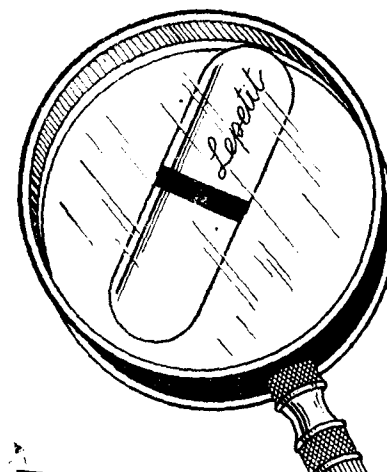
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Synthomycetine (Chloramphenicol Lepetit) has a wide range of antibacterial action (both Gram-negative and Gram-positive bacteria) possessing also a considerable antiviral activity. Known for its prompt penetration to the body fluids and tissues and rapid excretion, its use in clinical practice is very extensive.


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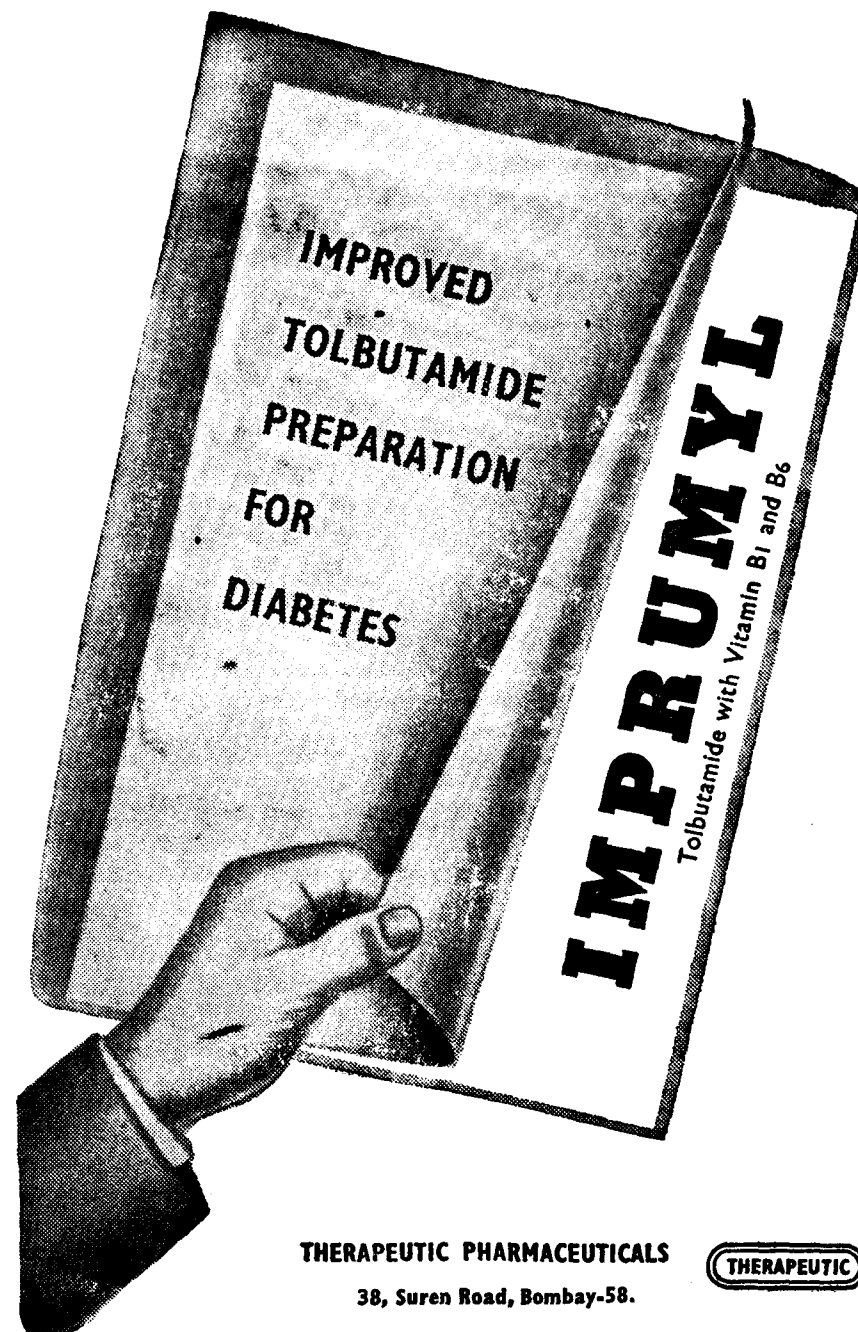
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THERAPEUTIC PHARMACEUTICALS

38, Suren Road, Bombay-58.

THERAPEUTIC

The Psyche and the Soma

In general practice, at least 40% of patients have symptoms of purely functional disorders.

(Lancet, 1958. 1525)

A large proportion of the patients who flock into the general practitioner's rooms complain of symptoms that often defy classification. Special investigations fail to reveal any evidence of organic disease.

Eventually, the symptoms are attributed to some psychosomatic disturbance.

Such a diagnosis is not always welcomed by a fretful patient. He is sure that his symptoms are genuine and stem from some very real organic trouble. He wants that trouble pin-pointed — not an explanation of the mind's effect on the body, or how the Psyche and Soma are related.

Quite often, therefore, he comes to his own conclusions. He might blame weather, water, the food he is eating — even (and this is curious) the medium in which this food is cooked.

So, manufactured cooking media are often accused of causing such unrelated symptoms as defective vision, sore throat and gastro-intestinal disorders, nervous manifestations and general debility. DALDA Vanaspati, for instance, has borne its share of these 'attached' symptoms.

But doctors and householders know that DALDA has been widely in use for 30 years in India. That is proof enough of its good-

ness as a cooking medium. But, more conclusive than that are facts about DALDA itself — facts that demonstrate how nourishing it is as a food.

DALDA is wholly made from refined vegetable oils. It is partially hydrogenated, it is deodorised and marketed in a pleasant semi-solid form. It melts at 37°C — body temperature — which means it is readily absorbed and utilised. And it is just as easily digestible as the oils from which it is made (groundnut and *til* oil).

DALDA's energy content is as high as anything else that could be used for cooking: 255 calories per ounce. It is fortified with 700 International Units of Vitamin A — no cooking medium in use in India gives more — and 56 IU of Vitamin D.

DALDA is untouched by hand during manufacture and is made to Government-approved standards. It arrives in the home fresh and free from contamination of any kind because it is hygienically sealed in double-lidded, air-tight tins.

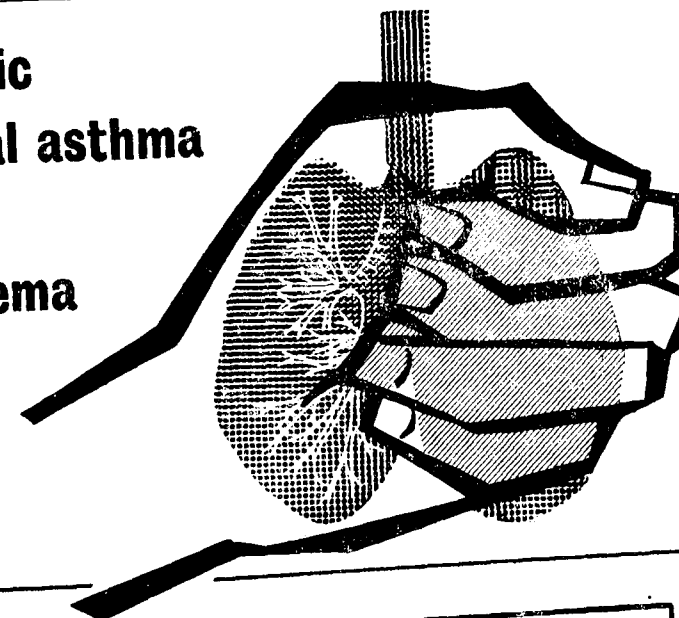
All this makes DALDA a cooking fat of high, reliable and unvarying quality. It's a valuable part of healthy balanced meals.

Few people need to be reassured about DALDA and its value as a food. But those who do have many facts available to help them. These facts may guard against the Psyche disordering the Soma and, so, swelling the '40%' who visit the doctor with imagined troubles.

HINDUSTAN LEVER LIMITED, BOMBAY

DL/20

In chronic bronchial asthma and emphysema



CHOLEDYL*



before CHOLEDYL



reduces the need for aerosol therapy

after CHOLEDYL



reduces coughing



increases vital breathing capacity



- provides a degree of effectiveness that cannot be obtained from aminophylline
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- prevents bronchospasm without central nervous stimulation
- helps relieve the interstitial oedema
- is well tolerated
- maintains efficacy during prolonged administration

LITERATURE
ON APPLICATION

Choledyl is available in tablets containing 100 mg. and 200 mg. choline theophyllinate B.P.C. and is supplied in bottles of 100 tablets.

Manufactured in India by: ALLEN & HANBURYS LTD. BOMBAY 1

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EXCELLENT TOLERANCE—WELL
SUITED FOR ALL ISONIAZID &
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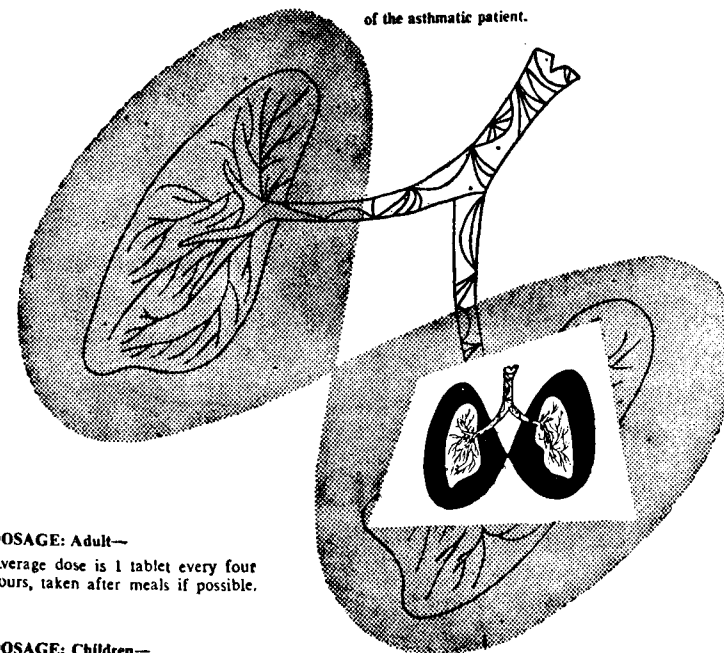


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A preparation for the
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Tedral offers in a single tablet, the combined effects of three
drugs, each of them valuable for the symptomatic relief of asthma.
THEOPHYLLINE, to relax the spasm of the
bronchial musculature.
EPHEDRINE HYDROCHLORIDE, to relieve oedema of the
bronchial mucosa in addition to relaxing the bronchial muscles.
PHENOBARBITONE, to relieve the anxiety
of the asthmatic patient.



DOSAGE: Adult—
Average dose is 1 tablet every four
hours, taken after meals if possible.

DOSAGE: Children—
6-12 years: $\frac{1}{2}$ tablet not more often
than four hourly.
Under 6 years: as decided by the physician.

PACKING:

Tedral is supplied in cartons of
24 tablets. On sale at all chemists.
Tedral Plain in packs of 24, 120 and 500.
Tedral Enteric in packs of 24.

TEDRAL ENTERIC COATED is also available to give symptomatic
relief of asthma four hours after administration.

TEDRAL ENTERIC COATED is therefore indicated for
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DOSAGE: 1 tablet of Tedral and 1 tablet of Tedral Enteric
Coated on retiring, give eight hours symptomatic relief of asthma.



No Warner preparation has ever been advertised to the public.

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Now you can freely prescribe

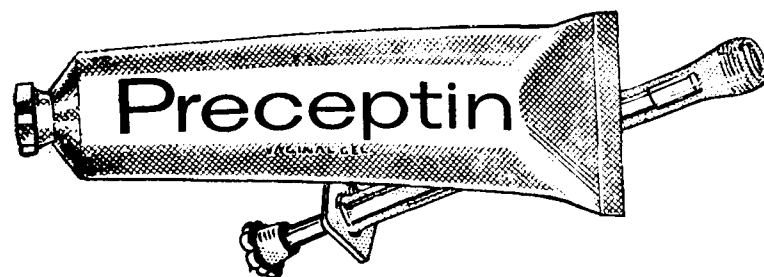
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VAGINAL GEL

Obviates the use of a mechanical barrier such as a diaphragm

Modern method of contraception perfected at the Research Laboratories of Ortho Pharmaceutical Corporation, New Jersey, U.S.A.

Successfully tested by extensive clinical trials... prescribed in several countries.

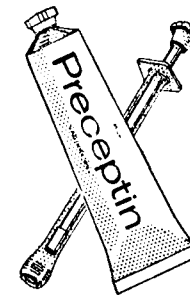


Preceptin Vaginal Gel offers the following incomparable features:

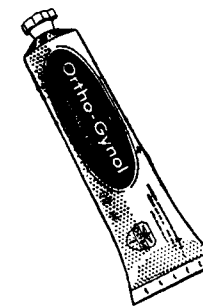
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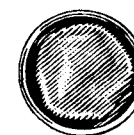
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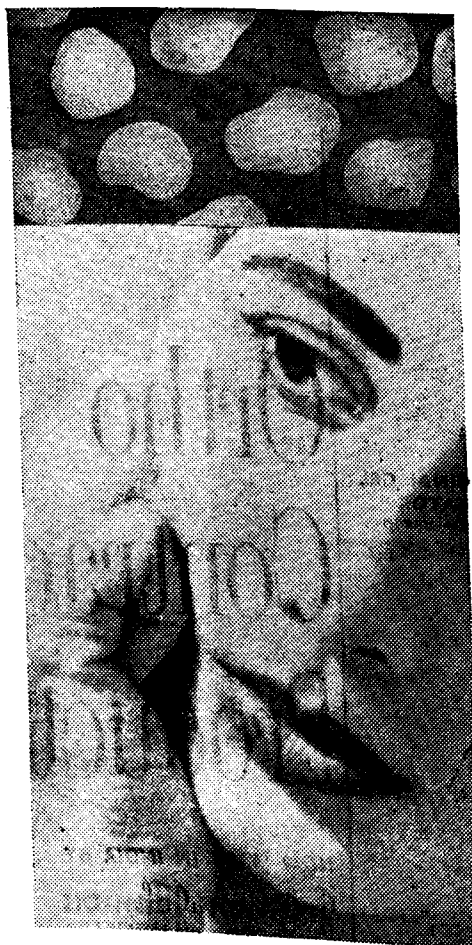
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* Information requested to eliminate un-authorized enquiries.



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HEMICAPS combines all the known haematopoietic factors such as:

Proteolysed Liver,
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HEMICAPS is therefore the ideal haematinic, which prevents and corrects anaemias of various etiology by rapidly raising the blood count.

Available in bottles of 21 and 100 capsules.

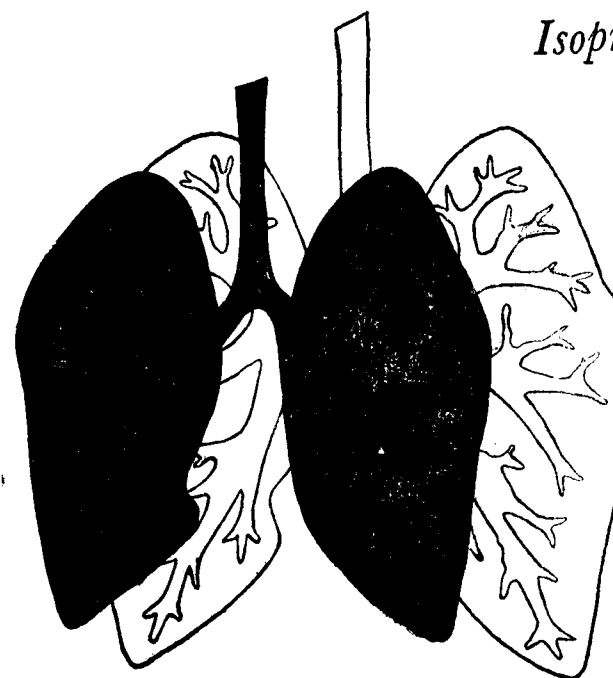
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BRAND

Isoprenaline Sulphate



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1. More potent and less toxic than either adrenaline or ephedrine.
2. Available in forms convenient for self-medication thus permitting treatment in the early stage of an attack when it is most effective.
3. Facilitates liquefaction and expectoration of bronchial secretions.
4. Rapid in action.
5. Does not induce tolerance in the patient.
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Tablets (Scored) of 20 mg: containers of 25 and 100
 Spray Solution No. 1: containers of 10 ml. (10 c.c.)
 Spray Solution No. 2: containers of 10 ml. (10 c.c.)

Literature and Prices on request.



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SILVERED DRAGEES

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Recommended in Convalescence, geriatrics, during and after Surgery, neurological disorders, metabolic and nutritional disorders, before and after physical or mental exertion

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EVEN WHEN ALL OTHER FORMS OF THERAPY HAVE FAILED

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Squibb Triflupromazine

THE DIRECT-ACTING ANTIEMETIC PHENOTHIAZINE DERIVATIVE
THE EFFECTIVE ANTIEMETIC PHENOTHIAZINE DERIVATIVE
THE SAFE ANTIEMETIC PHENOTHIAZINE DERIVATIVE
THE VERSATILE ANTIEMETIC PHENOTHIAZINE DERIVATIVE

Supply:

For oral use—Tablets of 10 mg. and 25 mg. in bottles of 25.

For parenteral use—Solution containing 10 mg. per ml. in 10 ml. vials.
and 20 mg. per ml. in 5 ml. vials.

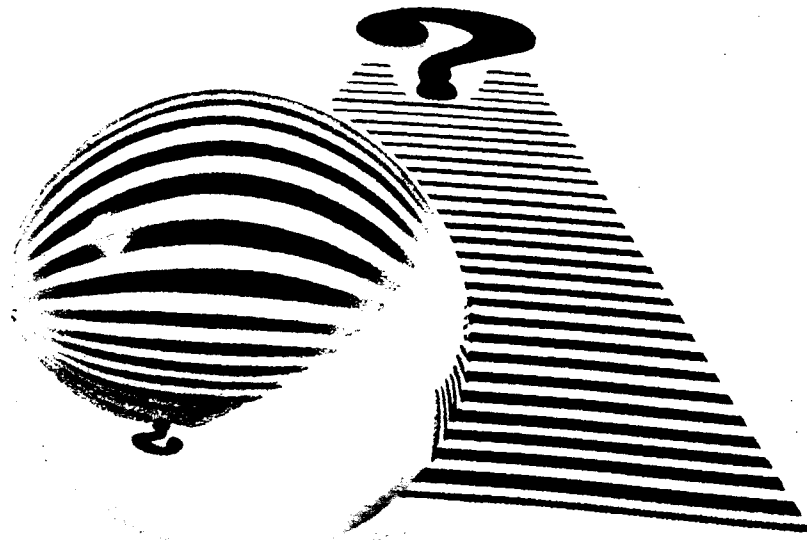
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A century of experience
builds faith

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'SIQUIL' IS A TRADEMARK



what lurks beyond the broad spectrum?

"Broad spectrum" has evolved into an especially apt term to describe a growing number of "specialized" antibiotics. These provide one of the best means of destroying pathogenic bacteria which range all the way from large protozoa through gram-negative and gram-positive bacteria to certain viruses at the far end of the spectrum.

But beyond the spectrum lurk pathogenic fungi. Aggressive infections often require intensive broad spectrum antibiotic attack. It becomes more apparent every day that fungal superinfections may occur during or following a course of such therapy.^{1,2} Long term debilitating disease, diabetes, pregnancy, corticosteroid therapy, and other causes may predispose to such fungal infections^{3,4} as iatrogenic moniliasis. These facts complicate the administration of antibiotics.

Mysteclin-V controls both—infection and superinfection. Mysteclin-V makes a telling assault on bacterial infections and, in addition, prevents the potentially dangerous monilial overgrowth.^{5,6} Mysteclin-V is a combination of the phosphate complex of tetracycline—for reliable control of most infections encountered in daily practice—and Mycostatin, the first well-tolerated antifungal antibiotic.

Case history after case history marked "recovered" provides clinical evidence of the special merit of this advance in specially designed antibiotics. When you prescribe Mysteclin-V, you provide "broad therapy" with extra protection that extends beyond the spectrum of other antibiotics.

References: 1. Dowling, H. F.: *Postgrad. Med.* 23:594 (June) 1958. 2. Gimble, A. L., Shea, J. G., and Katz, S.: *Antibiotics Annual 1955-1956*, New York, Medical Encyclopedia Inc., 1956, p. 676. 3. Long, P. H., in Kneeland, Y. Jr., and Worris, S. B.: *Bull. New York Acad. Med.* 33:552 (Aug.) 1957. 4. Rein, C. R., Lewis, L. A., and Dick, L. A.: *Antibiotic Med. & Clin. Ther.* 4:771 (Dec.) 1957. 5. Stone, M. L., and Mersheimer, W. L.: *Antibiotics Annual 1955-1956*, New York, Medical Encyclopedia Inc., 1956, p. 862. 6. Campbell, E. A., Prigot, A., and Dorsey, G. M.: *Antibiotic Med. & Clin. Ther.* 4:817 (Dec.) 1957. 7. Chamberlain, C., Burros, H. M., and Borromer: *Antibiotic Med. & Clin. Ther.* 5:639 (Nov.) 1958. 8. From, P., and All, J. H.: *Antibiotic Med. & Clin. Ther.* 5:521 (Aug.) 1958.

Supplied: Capsules (250 mg./250,000 u.), vials of 8 and nested packings of 50 and 100. *Pediatric Drops* (100 mg./100,000 u. per ml.), 10 ml. dropper bottles. *Powder for Pediatric Drops* (100 mg./100,000 u. per ml.), 10 ml. dropper bottles.

Mysteclin - V
Squibb Tetracycline Phosphate Complex and Nystatin (MYCOSTATIN)



SQUIBB

A century of
experience builds faith

SARABHAI CHEMICALS SARODA
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SOON TO ARRIVE



Amul

milk food for babies

APPROXIMATE COMPOSITION per 100 grams of powder

PROTEIN	22.0 gm.	VITAMIN A	1500 I.U.
FAT	18.0 gm.	VITAMIN D	400 I.U.
CARBOHYDRATE	52.0 gm.	VITAMIN C	30.0 mg.
CALCIUM	1.0 gm.	VITAMIN B ₁	0.6 mg.
PHOSPHORUS	0.8 gm.	VITAMIN B ₂	1.0 mg.
IRON	4.0 mg.	VITAMIN B ₆	0.3 mg.
NIACINAMIDE 6.0 mg.			

100 grams of powder = 471 calories

The makers of the famous AMUL milk products will shortly commence the manufacture of Infant Food. This comes as the culmination of 5 years of exhaustive research by scientists of the Central Food Technological Research Institute (CSIR), Government of India. This research was undertaken, in close collaboration with AMUL milk technologists, to standardize the formula and process of preparation.

The formula of AMUL Milk Food for Babies is particularly designed to suit the nutritional requirements of babies in the tropics. The formula has been recognized by the Indian Standards Institution.

Prior to its introduction into the market, independent doctors have tested AMUL Milk Food for Babies among control groups of infants in Calcutta, Delhi, Mysore and Madras. The results of many of these Feeding Trials have been published* and they amply confirm AMUL Milk Food for Babies as being a high quality product—nourishing, readily digestible and highly palatable.

Ample and continuing supplies of Amul Milk Food for Babies will be initially available in Maharashtra and Gujarat States as well as in Delhi City. All-India availability will be achieved after a time.

* *Food Science*, 6 (10), 243;
Indian Journal of Pediatrics,
26, (139), 290

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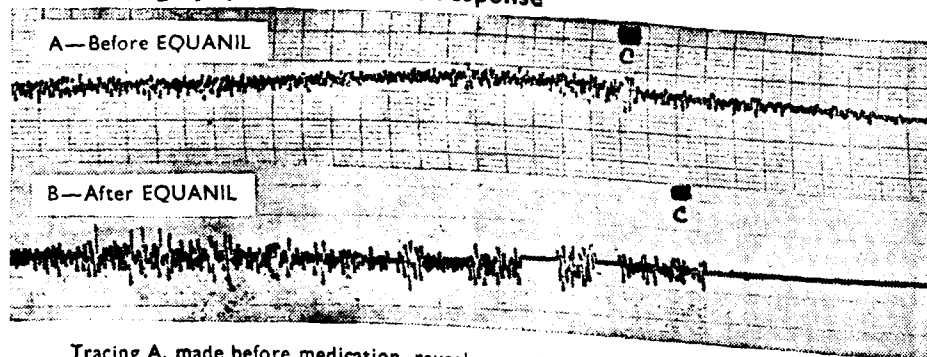


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Reduces Muscular Tension

Equanil[⊖]*

Electromyography shows decisive response



Tracing A, made before medication, reveals a marked action potential following the command to relax at point C. Note the difficulty and slowness with which the patient responded.

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The remarkable effectiveness of EQUANIL may be demonstrated in two ways. One is by its ability to relieve muscle spasm and neuromuscular tension.¹ The second is by its ability to relieve mental tension and anxiety.

¹ Dickel, H. A., et al.: West. J. Surg., April, 1956.

Usual Dosage: 1 tablet t.i.d. The dose may be adjusted either up or down, according to the clinical response of the patient.

Supplied: 0.4 Gm. tablets, bottles of 20, 100 and 250;
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anti-anxiety factor with muscle-relaxing action
...relieves tension



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Moderately long-acting

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For Intermediate Effect: (affords best control for most patients) NPH Insulin, Lilly, U-40 and U-80

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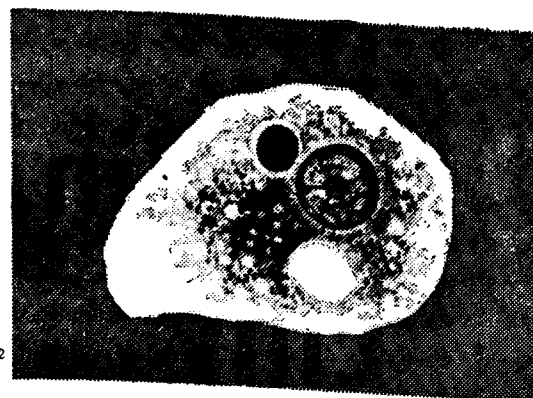
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Intestinal and Extra-Intestinal

Amebiasis may be asymptomatic or may produce symptoms indicating low grade infection, inflammatory colonic disease with or without diarrhea, or symptoms resembling appendicitis, gallbladder disease, or peptic ulcer.¹

"Frequently an unrecognized hepatitis coexists with intestinal amebiasis."²



Investigators agree that complete treatment of amebiasis must include a drug effective against hepatic complications as well as one which eradicates the intestinal parasites. Milibis and Aralen are highly recommended for this purpose.

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REGD. TRADE MARK

Each tablet contains 250 mg. bismuth glycolylarsanilate* and 75 mg. chloroquine phosphate.†

Complete Therapy and Prophylaxis of Amebiasis

* **MILIBIS** REGD. TRADE MARK

For Intestinal amebic infestation—a powerful amebicide, virtually nontoxic and highly effective clinically. Its relative insolubility assures high concentration in the large intestine.

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For Extra-intestinal amebiasis—"specific for amebic hepatitis and amebic liver abscess."² As effective as emetine but without its toxicity.³



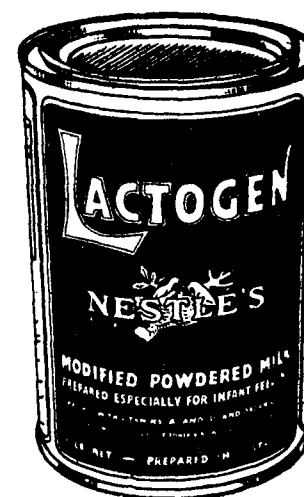
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- References 1 Sodeman, W. A., and Beaver, P. C. : *Am. Jour. Med.*, 12 : 440, Apr., 1952
2 Zavala, D. C., and Hamilton, H. E. : *Ann. Int. Med.*, 36 : 110, Jan., 1952
3 Conan, N. J. : *Am. Jour. Med.*, 6 : 309, Mar., 1949

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LACTOGEN

A spray dried full cream milk modified so that on reconstitution with water it closely resembles human milk in percentage composition. Fortified by the addition of Vitamins A and D and organic iron, entirely free of pathogens and of excellent digestibility.

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Range of
Whole Liver Extract
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Vitamin B-Complex.

For Parenteral use

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Whole Liver Extract
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Quick haemopoiesis
Maximum tolerance
Sustained effect.
Satisfies all Criteria
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Folic Acid Compound
Reinforced with Liver Extract

- Combats deficiency Syndromes
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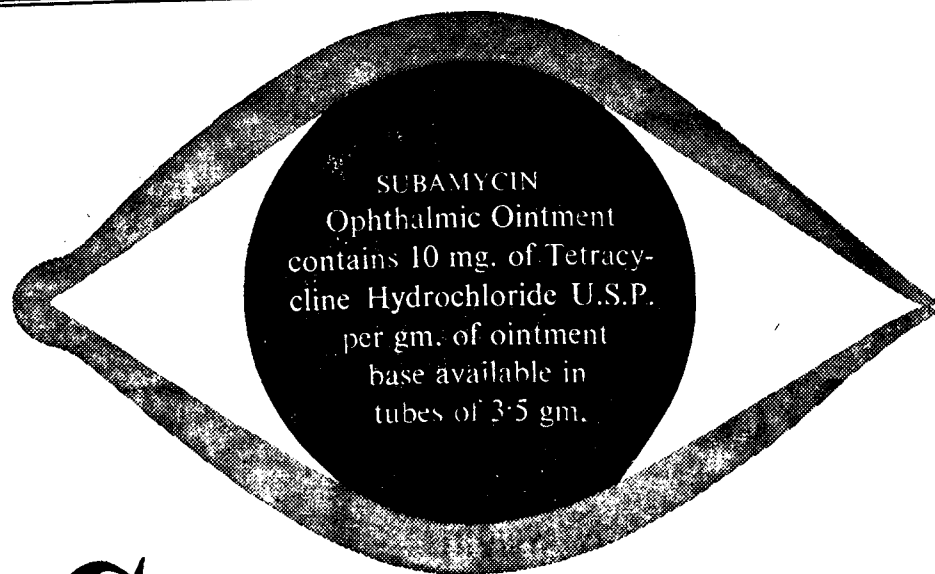
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A sonic food of fats, proteins and carbohydrates with calcium, Vitamin D and LYSINE in a highly emulsified form.

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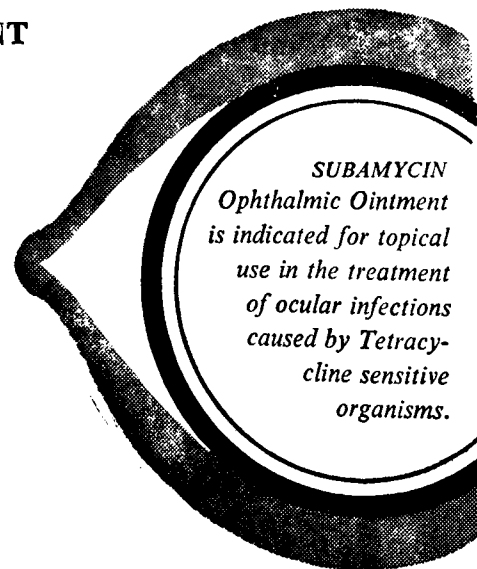
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TETRACYCLINE HYDROCHLORIDE U.S.P.

OPHTHALMIC OINTMENT

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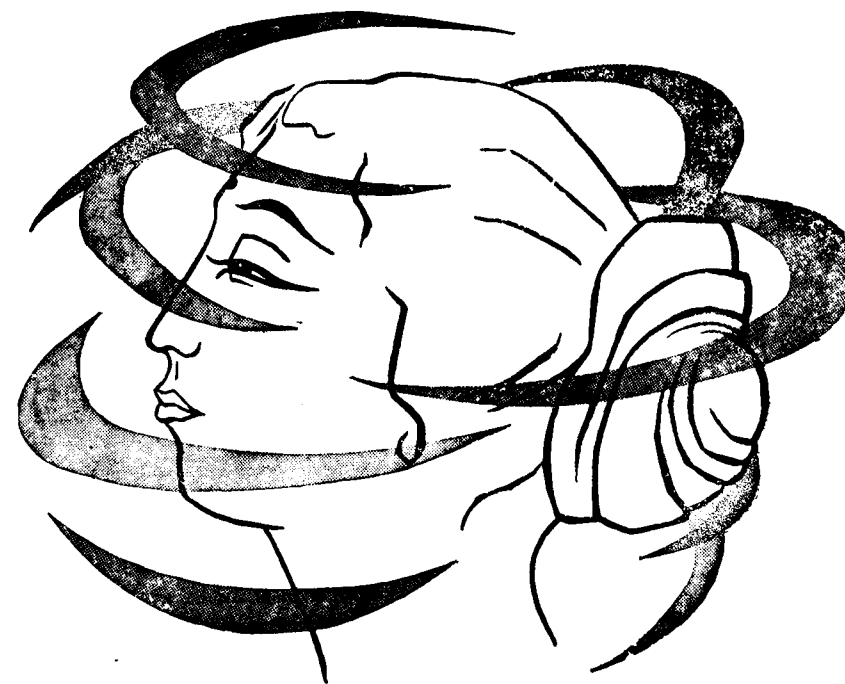
- Capsules :
250 mg. each in
bottles of 4, 8 and 100.
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1.0 gm. in 10 c.c. Polythene
dropper bottle.
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50 mg. each in bottle of 12.



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CALCUTTA-19

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SUB/DMV/11



in pregnancy

PYRIMESIN

makes the mornings carefree and gay



EAST INDIA PHARMACEUTICAL WORKS LTD., CALCUTTA-26

B.I. B-COMPLEX

each cc. contains:

Vitamin B₁ (Thiamine Hydrochloride) 25 mg.
 Vitamin B₂ (Riboflavin) 3 mg.
 Vitamin B₆ (Pyridoxine Hydrochloride) 50 mg.
 Nicotinamide 4 mg.
 Panthanol (d-pantothenyl alcohol) 25 mg.
 Choline Dihydrogen Citrate 1.5%
 Benzyl alcohol as preservative

B.I. ELIXIR B-COMPLEX

each fluid ounce contains:

Vitamin B₁ (Thiamine mononitrate) 25 mg.
 Vitamin B₂ (Riboflavin) 6 mg.
 Vitamin B₆ (Pyridoxine Hydrochloride) 8 mg.
 Nicotinamide 20 mg.
 Panthanol (d-pantothenyl alcohol) 500 mg.
 Choline Dihydrogen Citrate 12 mcg.
 Vitamin B₁₂ (cyanocobalamin) 8%
 Alcohol by volume in a syrup base 8%

BENGAL IMMUNITY CO., LTD.
 153, Dharamtala Street, Calcutta-13

MULTIVITAMINS PANVIT B.I.

DROPS

11 VITAMINS

INJECTION

10 VITAMINS

TABLETS

12 VITAMINS + 6 MINERALS

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	DROPS	INJECTION	TABLETS
Vitamin A	8000 I. U.	5000 I. U.	4000 I. U.
Vitamin D	1600 I. U.	500 I. U.	400 I. U.
Vitamin E	0.1 mg.	1.25 mg.	1 mg.
Vitamin B ₁	2 mg.	5 mg.	4 mg.
Vitamin B ₂	1 mg.	1 mg.	2 mg.
Vitamin B ₆	0.5 mg.	1.5 mg.	2 mg.
Vitamin B ₁₂	—	—	2 mcg.
Panthanol	4 mg.	2 mg.	4 mg. (Cal. Panthothenate)
Nicotinamide	50 mg.	12.5 mg.	10 mg.
Choline Dihydrogen Citrate	2 mg.	7.5 mg.	2.5 mg.
Vitamin C	80 mg.	25 mg.	30 mg.
Methionine	5 mg.	—	—
Folic Acid	—	—	0.15 mg.
			and Iron 3.34 mg.
			Calcium 70 mg.
			Phosphorus 60 mg.
			Magnesium 5 mg.
			Manganese 0.05 mg.
			Cobalt 0.005 mg.

PACKING

Drops—Bottles of 5 ml., 10 ml. & 30 ml.
 Injection—2 ml. amp., boxes of 6, 12 & 50
 R. c. bottle of 10 ml.
 Tablets—Bottles of 50, 100, 500 & 1000

TESTPHERIN injectable

Indicated in:
SENILE DEAFNESS.

Atherosclerosis.
Rejuvenation.

Each ml. contains:

Testosterone Propionate .. 25 mg.

Vitamin 'E' ... 10 mg.



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In gynecological and obstetrical disorders and pregnancy test

Prostradial
 Injectable
 (Progesterone + Oestradiol Benzoate + Vitamin E.)

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MUL-MIN

A DECAVITAMIN TONIC

for

Correcting Nutritional Deficiency States of Vitamin Origin

COMPOSITION

Each 100 mls. Contains

Vitamin B ₁ B.P.	75 mg.	Nicotinic Acid Amide B.P.	350 mg.
Riboflavine B.P.	15 mg.	Calcium Pantothenate U.S.P.	35 mg.
Vitamin B ₆ B.P.C.	7 mg.	Inositol N.F.	175 mg.
Vitamin B ₁₂ B.P.	50 mcg.	Vitamin A	17500 I.U.
Folic Acid B.P.	10 mg.	Vitamin D ₂ B.P.	3500 I.U.

INDICATIONS

Beri-beri, pellagra, cheilosis, glossitis, photophobia, rickets, febrile conditions due to low resistance to infection, anaemias associated with the deficiency of the B complex Vitamins. A valuable aid in pregnancy, lactation and during convalescence after sickness.

ASSOCIATED DRUG CO. Private LTD., YERCAUD.

BITAPHENICOL CAPSULES

Each capsule contains:

Chloramphenicol, B.P. ... 0.25 Gm.

INDICATIONS:

Typhoid; Para Typhoid; Rickettsial diseases;
Whooping Cough; Respiratory infections;
Gastro-Enteritis; Meningitis; etc., etc.

Available in packings of 12 & 100 Capsules.

Clinical sample and descriptive literature will be
available to medical profession on request.

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THYMOCIN

for

PYORRHOEA - TOOTHACHE - TOOTHDECAY

and other diseases of gums & mouth

OTHER



PRODUCTS

HYPOTONE (Syrup Hypophosphites Comp.)
HICOLIN (Cough Syrup)
VIBICINE (B-Complex with C)
TONOZIME (Vitamins with Glycerophosphates)

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Manufactured by:

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43, Churchgate St., Fort,

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IN THE TREATMENT OF

DYSMENORRHOEA— Congestive and Spasmodic

UTONE

uterine sedative and tonic

Indications:

Dysmenorrhoea spasmodic and congestive
Metrorrhagia
Chronic endometritis
Habitual abortion
Menopausal disorders

Composition:

Oudumbara fruit (Ficus glomerata), Ashwagandha (Withania Somnifera), Shatavari (Asparagus Racemosus), Ashoka (Saraca Indica), Anantmoool (Hemidesmus Indicus), Kathemath (Amaranthus Spinosa), Jesthamadha (Glycyrrhiza Glabra), Indrajawa (Holarrhena Antidysenterica), Parasika Yawani (Hyescyamus Niger).



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[TABLETS]

A SAFE ANALGESIC - SEDATIVE
CONTAINS:-BARBITONE, AMIDOPYRIN & CAFFEINE.

FOR ACUTE PAIN OF
RENAL COLIC, RHEUMATISM,
GOUT, SCIATICA, ECLAMPSIA,
ETC.,

INDO-FRENCH PHARMACEUTICAL CO., CATHOLIC CENTRE, MADRAS-1.

A Standardised Tonic

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Contains

- Acetyl Methionine
- Choline
- B Complex
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- Hydrolysate base

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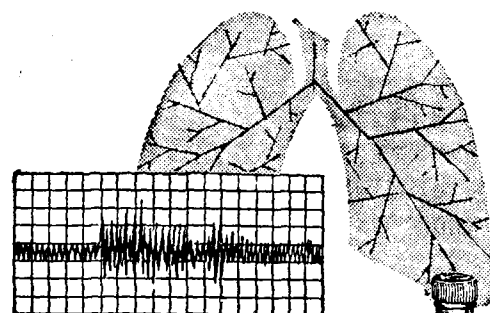
Iodine therapy without iodism

COLLOSOL IODINE

Collosol Iodine can be used without risk in all conditions in which ordinary forms of iodine, such as potassium iodide, would be indicated or used.

Packings: Oral 0.2%—112 ml. 560 ml. and 1,120 ml. bottles
Injections: 0.2%—Boxes 6x5 ml. & 6x10 ml. amps.
0.4%—Boxes 6x10 ml. amps. & 30 ml. vials
0.8%—Boxes 6x10 ml. amps. & 30 ml. vials
1.0%—Boxes 6x1 ml. amps. & 10 ml. vials

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(Incorporated in England. The Liability of Members is Limited)
COURT HOUSE, CARNAC ROAD, BOMBAY-2



in asthmatic
and bronchial troubles

ASMOLIN

with aminophylline

COMPOSITION

Potassium Iodide	700 mg (10.5 grs)
Aminophylline	360 mg (6.0 -)
Nicotinic Acid	120 mg (4.8 -)
Calcium Hypophosphite	800 mg (12 -)
Caffeine Alkaloid	60 mg (.9 -)
Potassium Guaiacul Sulphonate	1000 mg (15.4 -)
Ephedrine Hydrochloride	120 mg (1.8 -)
Tincture Belladonna	1.9 c.c. (30 minims)
Aromatic Vehicle	ad. 30 c.c.



G. D. Pharmaceuticals Private Ltd.
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COLLOID CHEMOCALCIUM

WITH VITAMIN B₁₂

IN 10 ml. VIALS

Each ml. contains:

Colloidal Calcium (as Oleate)	0.5 mg.
Vitamin D ₂ U.S.P.	5000 I.U.
Vitamin B ₁₂ B.P.	50 mcg.
Benzyl Alcohol B.P.	1%
Phenol B.P. (as preservative)	0.5%



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Smile away that ANAEMIA with BIRON D_C LIVER

"FORTE"

A rational therapy for anaemias
of any etiology



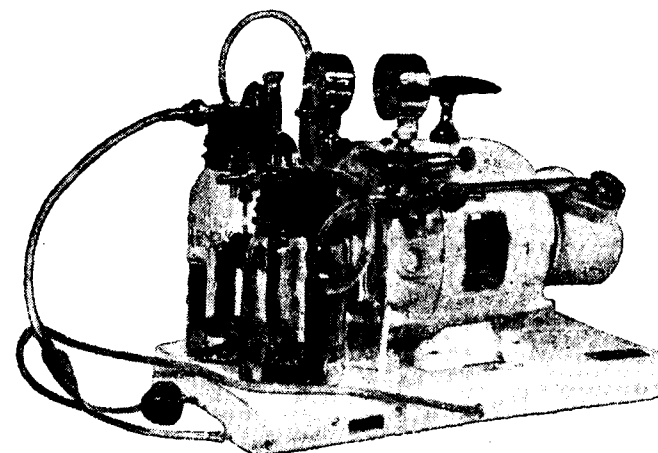
Each 30 ml. contains

Proteolysed Liver Extract derived from 15 G. of fresh liver having Vitamin B ₁₂ activity equivalent to 3 mcg. of Cyanocobalamin.	
Proteolysed Stomach Extract derived from 5 G. of raw Stomach.	
Thiamine Mononitrate U.S.P.	40 mg.
Riboflavin B.P.	2 mg.
Vitamin D ₂ B.P.	2000 I.U.
Folic Acid U.S.P.	2 mg.
Niacinamide B.P.	50 mg.
Calcium Hypophosphite B.P.C.	1 G.
Ferrous Gluconate B.P.	0.5 G.
Traces of Copper, Manganese and Cobalt	
Flavoured Syrup	q.s.



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"INSIST ON 'QUICO' PRODUCTS" SUCTION & PRESSURE PUMP



Compact and easily portable unit with a 1/4 H.P. Electric motor to which is attached an enclosed pump, the assembly mounted on a metal base. Additional features: Automatic oiling, filtering, pressure and vacuum regulating valves vacuum and other bottles, on off switch and provisions for foot switch connection, on 230 volts AC.

(a) with one bottle, vacuum guage, suction hook.

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- * Interchangeable barrels and pistons
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FORTE WITH B XII COMBINATION PACK

Each ml. of the mixed solution Contains:

*Vitamin B ₁₂ B.P.	75 mcg.	Choline Chloride	25 mg.
Vitamin B ₁ B.P.	100 mg.	Methionine N.F.	5 mg.
Riboflavin B.P.	3 mg.	Inositol N.F.	3 mg.
Vitamin B ₆ B.P.C.	5 mg.	Benzyl Alcohol B.P.	3 %
Nicotinamide B.P.	0.15 G.	Phenol B.P.	
Panchenol	5 mg.	(as preservative)	0.5 %
		*after reconstitution	

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Available Again to the Medical Profession

SUMMIT BRAND LUER-LOCK SYRINGES

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Luer-Lock Syringes, **Summit Brand**, of resistance glass, calibrated precisely and scaled to read **easily and permanently**, each in a box.

Centre Nozzle	2 c.c.	5 c.c.	10 c.c.	20 c.c.
	Rs. 2/25	2/37	3/25	5/25 each
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A Novel Approach to the Chemotherapy of Tuberculosis

PHYTEBIN-272

(P-oxy-m-methoxy benzaldehyde-isonicotinoyl hydrazone)

**A NEW NONTOXIC TUBERCULOSTATIC
CHEMOTHERAPEUTICAL**

widely used in the U.S.S.R., East Germany & Australia etc.

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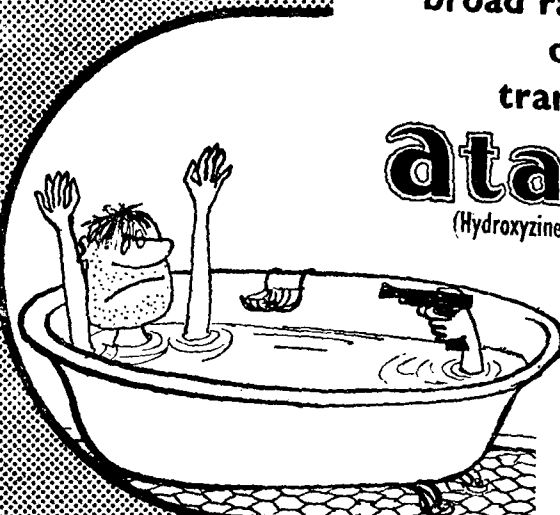
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the first
broad range
original
tranquillizer



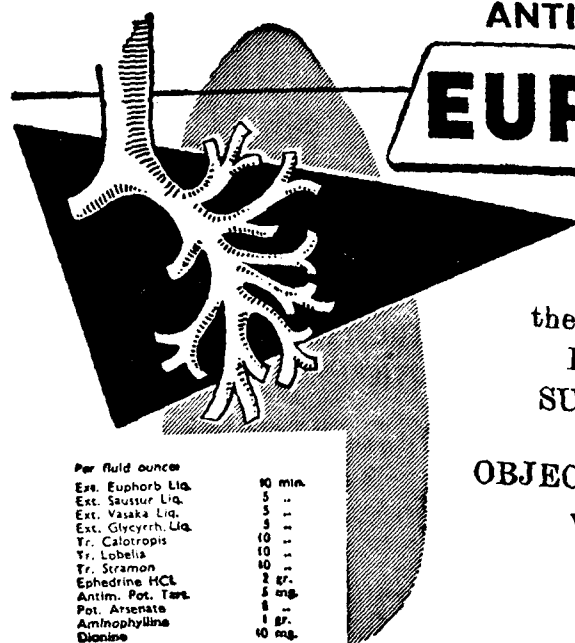
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for
Emotional
Stability

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A POTENT
ANTI-ASTHMATIC

EUPHOMIN



the therapy that affords
PROMPT RELIEF
SUSTAINED ACTION
and
OBJECTIVE IMPROVEMENT
without side-effect.

Per fluid ounce	30 min.
Ext. Euphorb. Liq.	5 --
Ext. Scutell. Liq.	5 --
Ext. Vasaka Liq.	5 --
Ext. Glycyrrh. Liq.	5 --
Tr. Calotropis	10 --
Tr. Lobelia	10 --
Tr. Stramon.	10 --
Ephedrine HCL	2 gr.
Antim. Pot. Tart.	5 mg.
Pot. Arsenate	8 --
Aminophylline	1 gr.
Dionine	10 mg.

THE MYSORE NUTRIMENTS, BANGALORE 2

Please prescribe
IN CASE OF
PYRI-B
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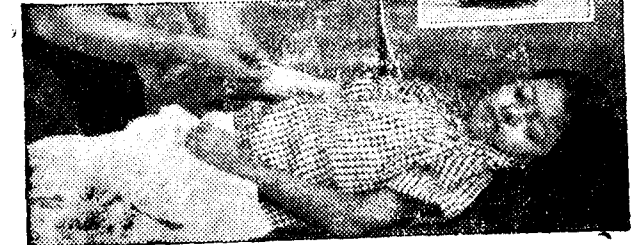
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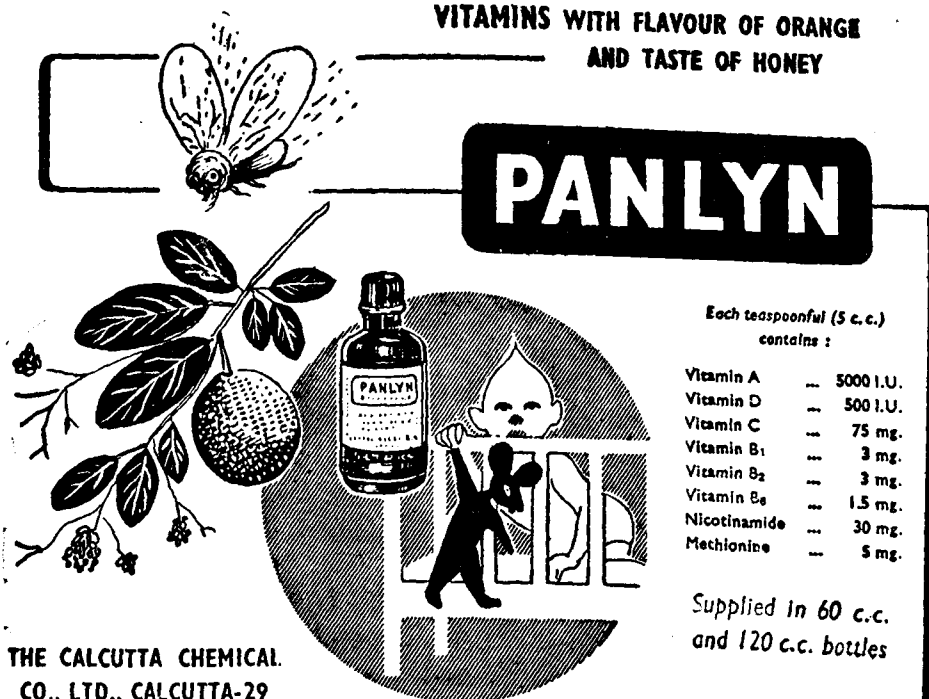
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Original Articles

MEDICAL ASPECTS OF PARAPLEGIA*

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PARAPLEGIA strictly speaking refers to a parallel paralysis of the lower limbs. The lower part of the trunk may also be affected in addition to the paralysis of the limbs. A Medical Dictionary of 1693 describes it as "a palsy which seizeth all the parts of the body below the head." Although paraplegia refers only to the paralysis of the lower limbs, paralysis of the upper limbs has also been called paraplegia. Thus Purves Stewart refers to brachial paraplegia when he deals with a spastic paraplegia of the upper limbs.

We may classify paraplegia according to the site of the lesion which causes the paralysis or according to its clinical types. Thus paraplegia may be due to causes in the brain, spine, spinal cord, meninges etc.

Causes of paraplegia.—I. BRAIN:—Cerebral diplegia; hydrocephalus; microcephaly; tumour of falx cerebri; thrombosis of superior longitudinal sinus.

II. SPINAL:—(1) Vertebral:—(a) Tuberculosis; (b) secondary deposits from breast, prostate, bronchus etc.; (c) trauma; (d) disc lesions—cervical and lumbar; (e) achondroplasia; and (f) Paget's disease.

* Based on a lecture delivered at a symposium on "Paraplegia" held in Mangalore on 19th March, 1960.

(2) *Meningeal*:—(a) Syphilis-transverse myelitis; Erb's syphilitic paraplegia; spastic amyotrophic meningo-myelitis; hypertrophic cervical pachy-meningitis; (b) tuberculosis; (c) tumours—meningioma; neurofibroma; (d) secondary deposits—leukæmia; Hodgkin's disease; malignant and (e) vascular-thrombosis.

III. CORD:—(1) *Degenerative conditions*:—(a) Subacute combined degeneration; (b) disseminated sclerosis; (c) amyotrophic lateral sclerosis; and (d) tabes dorsalis.

(2) *Tumours*:—(a) Ependymoma; (b) glioma; and (c) neurofibroma.

(3) *Toxic conditions lathyrism*.

IV. PERIPHERAL LESIONS:—(1) *Infection*:—(a) acute anterior poliomyelitis; (b) infective polyneuritis and (c) diphtheria.

(2) *Deficiency*:—(a) beri-beri; and (b) pellagra.

(3) *Metabolic diabetes mellitus*.

(4) *Poison/toxin*:—(a) arsenic; (b) lead and (c) alcohol.

(5) *Myoneural junction*: myasthenia gravis.

(6) *Muscles*: myopathy.

(7) *Malignant*. Secondary to bronchogenic carcinoma.

V. OTHER CAUSES—HYSTERICAL:—Caisson disease.

Clinically we may classify paraplegia according to the state of the limbs affected, as detailed below:—(1) Spastic paraplegia (lesions in brain, vertebræ, meninges, cord etc). (2) Flaccid paraplegia or peripheral paraplegia (lesions of the peripheral nerves, anterior horn cells, myoneural junction and muscles). (3) Ataxic paraplegia (due to lesions involving lateral and posterior tracts) and (4) Hysterical paraplegia.

SIGNS AND SYMPTOMS OF PARAPLEGIA:—These will depend on three factors *namely*, the site of the lesion; the nature of the lesion and the mode of onset—acute or gradual.

The symptoms are: (a) motor; (b) sensory; (c) sphincteric disturbances; (d) vasomotor, sudorific (sweat secretion), pilo-motor (goose flesh) disturbances and (e) sex disturbances.

(a) *Motor function*:—In paraplegia of gradual onset, the first movement to be affected is dorsiflexion of the foot. The foot, therefore, catches on uneven surface. The toe of the shoe is worn rapidly. The next movement to be affected is flexion of the limb as a whole. The patient cannot now lift his leg off the ground. His gait becomes shuffling. Later the legs are kept in complete extension with severe adductor spasms. This stage where the legs are held stiff and extended is called 'paraplegia in extension.' Sudden severe clonic movements due to extension

spasms are noted frequently. On examination of the patient during this, it is noticed that the jerks are very brisk. The plantar response becomes extensor at an early stage of the disease.

The stage of paraplegia in extensor does not last long in a progressive lesion of the spinal cord. The only exception to this rule is in conditions which affect only the pyramidal tracts alone. Amyotrophic lateral sclerosis, which causes degenerative changes in the pyramidal tracts only, is one such condition. In all the other conditions when a more or less total separation of the cord takes place below the level of the lesion the patient develops the *second* state or 'paraplegia in flexion.' At first the patient gets flexor spasms. These spasms increase in force and frequency. Finally the legs and thighs are kept completely flexed against the abdominal wall. Great force is required to extend the limbs, but the limbs rapidly resume the flexed position. Extensor response is now very easy to elicit. The field from which it can now be elicited is wider. Pinching or pricking the thigh produces the extensor response. Because of the severe flexion of the limbs due to the over-activity of the flexor muscles, knee and ankle jerks which require the action of extensor muscles, become either absent or difficult to elicit. Ankle and patellar clonus also disappear for the same reason.

What has been stated above holds good only for a paraplegia of gradual onset. In paraplegia of sudden onset due to a transection of the cord the clinical picture is entirely different. The patient is in the beginning, in a state of total flaccid paralysis with total sensory loss below the level of the lesion. This is called the stage of "Spinal shock." When this state of shock passes off, the patient does not pass through the stage of extension. As both the pyramidal and extra-pyramidal tracts have now been severed simultaneously he passes directly into the stage of paraplegia in flexion.

(b) *Sensory disturbances*:—Sensory changes may occur at the site of the lesion and below the lesion. The commonest sensory disturbance at the site the lesion is pain. Such pain may be present over the lesion itself as in tuberculous diseases of the spine or in prolapsed disc or may be referred to the area supplied by the segment affected. This is called "Root pain." Apart from pain other sensory disturbances also develop. The first to develop is paræsthesia or perverted sensation and hyperæsthesia. In hyperæsthesia the patient will complain of discomfort or pain even though the stimulus is mild. In paræsthesia the stimulus provokes an unusual reaction. For example, the patient may complain of tingling when the skin is touched lightly. Such sensory disturbances are more or less symmetrical. If the spinal lesion progresses the patient develops a dissociated anæsthesia *i.e.*, analgesia and thermoanæsthesia,

i.e., loss of pain and loss of temperature-sense. Tactile or touch sense may remain normal. When the paraplegia is complete, anæsthesia will develop. In incomplete paraplegia certain types of sensation escape and we thus get the "Dissociated anæsthesia." Thus in Brown Sequard syndrome motor paralysis and impairment of joint, muscle and vibration sense occurs on the side of the lesion, while pain, temperature, and touch to a slight extent, is affected on the opposite side of the lesion. Another important feature noted with the sensory disturbances is that the area of maximum anæsthesia is usually considerably below the upper level of compression, and is surmounted by a much broader zone of paræsthesia. The anæsthesia of spinal temporary variations in its intensity at different times and its upper boundary may be difficult to define. Finally in paraplegia due to compression from outside, the sacro-coccygeal area is seen to be less affected than the other areas e.g., the thigh. This is because of the position of the fibres at the different levels. Fibres from the lower part of the body and from the sacro-coccygeal region are pushed more and more inwards by the fibres entering the cord from the higher area. The touch fibres are, therefore, arranged in the spinothalamic tract which carries pain, temperature and half touch, in a lamellar arrangement. Another important fact which is to be borne in mind is that the fibres which carry pain and temperature sensation in the spinothalamic tract do so after crossing over to the opposite side with different degrees of obliquity in different parts of the cord. In the lumbo-dorsal region they do so very slowly and do not reach the opposite side until they reach the 12th dorsal segment. In the mid-dorsal region, however, the decussation is more rapid. At all levels pain crosses most quickly, then cold, then heat, and touch slowest of all. Thus in a tumour of the meninges, say in the lower dorsal region, pressure on the fibres carrying pain and thermal sensation may produce various disturbances, while touch sensation may be unaffected.

It may be stated here that in paraplegias where only the motor tracts are affected sensory disturbances will not be present. Thus in lathyrism, which is seen in North India and is due to the toxin ingested with *kesari dhal*, familial spastic paraplegia, and amyotrophic lateral sclerosis sensory disturbances do not occur.

(c) *Sphincteric disturbances*:—In a normal person emptying of the bladder is a reflex function which is under the control of the will. It can be initiated or inhibited at will. The bladder is innervated by the sympathetic chain through the hypogastric nerve with centres in the lumbar segments 1 and 2; parasympathetic chain through the pelvic and erigentes nerve with centre

in the sacral, segments Nos. 2, 3 and 4. Sympathetic stimulation causes a relaxation of the bladder wall and contraction of the internal sphincter. The parasympathetic system causes a contraction of the bladder wall and a relaxation of the sphincter. In the early stages in an acute transection of the cord i.e., in the state of spinal shock, the bladder gets passively distended and full. It may rise up in the abdomen and may even fill the entire abdomen. As the distention increases the urine begins to dribble. We now find what is called retention with overflow. When this state of shock passes off, the patient develops an automatic bladder. This occurs concurrently with the return of the extensor plantar response, the reappearance of knee-jerks and of the muscle-tone. Reflex contraction of the bladder now occurs. In some cases scratching of the sole of the foot may not only produce an extensor plantar response but also a reflex emptying of the bladder. In such cases of paraplegia in flexion, distention of the bladder will also produce excessive sweating on the affected limbs and at times also vomiting.

In cases of *tabes dorsalis* the distention of the bladder is due to the interference with the afferent impulses from the bladder wall. The full bladder does not now produce the sensation of fullness. The urine after some time begins to dribble and overflow. The condition of the bladder, therefore, depends on whether there is a sympathetic overactivity, when the patient gets distention and dribbling, and/or parasympathetic stimulation when there will be a hypertonic bladder.

Similar to the bladder disturbances, severe constipation develops in patients in the state of spinal shock. When the shock passes off the patients develop automatic reflex defæcation. Since the force of rectal contraction is not so powerful as the contraction of the bladder, the tendency for all disturbances of rectal innervation is to cause constipation.

(d) *Sweating and sexual reflex*:—In paraplegia-in-flexion the cremasteric, dartos and bulbocavernous reflexes are present. Reflex erection of the penis can be evoked by handling the organ or by stimulating the skin alongside. Spontaneous ejaculation can also occur. These sexual reflexes are associated with the contraction of the leg flexors, rectus abdominis and adductors of the thighs. Excessive sweating of the affected limbs occur. Priapism in these cases is often painful.

Trophic changes:—These changes occur in the parts paralysed. In chronic paraplegia, hypertrophy of the nails is a feature noted. This may be due to the overactive vasomotor function. In *tabes dorsalis* with ataxic paraplegia the nails fall off. Bone and joint senses are also affected in the latter condition giving rise to pathological fractures, Charcot's joints etc. In syringomyelia multiple trophic ulcers are seen over the fingers.

It must be emphasized that the commonest cause of paraplegia in young adults is syphilis. In an older person secondary metastatic carcinoma from a primary in the prostate or breast is the commonest cause. Tumours of the meninges and cord are all important causes. But tumours in this part of the nervous system is not so common as tumours of the brain. Tumours of the meninges and conditions like syphilitis or tuberculous meningitis because of their tendency of spread upwards and downwards along the meninges, exert a wider and diffuse pressure over the cord. So there is a wide difference between the upper level of anæsthesia and the lower level of automatism. Tumours of the cord cause complete and total paralysis and the level of segmental involvement is easily defined and coincides with the level of automatism.

2. **FLACCID PARAPLEGIA**:—This may involve only the peripheral motor nerves or anterior horn cells as in anterior poliomyelitis, giving rise to no sensory disturbances. Or, it may be due to a viral infection characterized by fever, sensory disturbances and flaccid paralysis. Deficiency diseases like beri-beri, paraplegia due to alcohol, diabetes mellitus etc. are all characterized by the presence of the sensory and motor disturbances with the development of trophic changes. Flaccid paralysis is also evidenced by the loss of tone in the muscles, flaccidity, wasting of the muscles, absence of jerks. Plantar response is either absent or flexor.

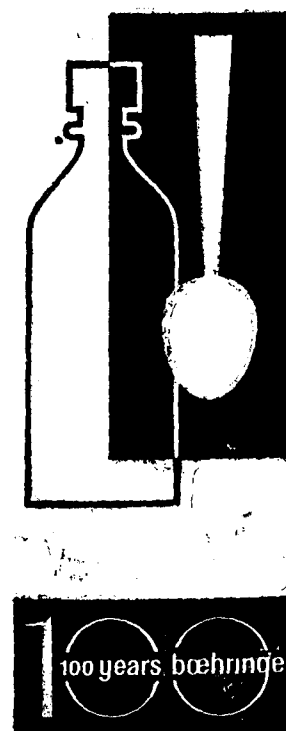
3. **ATAXIC PARAPLEGIA**:—Degenerative changes take place in the posterior columns. The lateral tracts may also be involved. Tendon reflexes may be absent or exaggerated. The loss of bone, joint and vibration sense gives the patient the characteristic ataxic gait. He lifts the legs high without control and stamps them down. Tabes dorsalis, Friedreich's ataxia, subacute combined degeneration of the cord, disseminated sclerosis etc. are some of the conditions which cause ataxic paraplegia.

4. **HYSTERICAL PARAPLEGIA**:—This may be of the spastic or the flaccid type. It does not usually conform to any typical clinical pattern. True clonus is never seen in hysterical paraplegia, although pseudoclonus may be present. In hysterical paraplegia, the patient may be able to move the limbs normally while in bed but collapses when asked to stand up. Usually young adolescent girls suffer from this condition. It is usually not difficult to diagnose this form of paraplegia.

Conclusion.—Paraplegia is a distressing condition to the patient and to the physician. The patient who is usually in full possession of his mental faculties feels helpless and distressed that he has to depend on others for the performance of some of the most elementary physiological functions. The doctor feels sad at his inability to do much for the patient. The kindness and encouragement are perhaps the few things which may comfort the patient and console him.

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CLINICAL TRIAL WITH PYRROLIDINO-METHYL- TETRACYCLINE (Reverin)*

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Assam Medical College, Dibrugarh

TETRACYCLINE-hydroxy tetracycline and chlortetracycline have established themselves as powerful wide-range antibiotics but their untoward side-effects have limited their wide applicability. Oral administration is associated with variable blood-levels and enterocolitis is not uncommon (Bohn and Koch, 1958). It has been held that tetracyclines inhibit the normal flora of the intestine and allow the pathogenic organisms to multiply with resultant enterocolitis; Bohn and Koch, however, have adduced evidence to show that tetracyclines cause capillary hæmorrhage in various organs including the gastro-intestinal tract with the production of ulceration in the mucosa but the high concentration of tetracycline in the gut after oral administration, is an additional factor in causing irritation with local damage and resultant enterocolitis. To avoid these side-effects Bohn and Koch treated 2000 patients with intravenous tetracycline; they very rarely had a case of treatment-failure and not a single case of enterocolitis. These tetracyclines are very slightly soluble at the pH of the body-fluids; they are soluble in highly acid or alkaline media; the solutions when given parenterally produce local damage and painful thrombophlebitis (Siedel *et al.*, 1958). Aminomethylation of tetracycline has increased the solubility by 2500 times and one of such series pyrrolidino-methyl-tetracycline is undergoing clinical trial under the trade name of *Reverin*. The antibiotic properties of Reverin correspond to those of the parent substance tetracycline and its action is due to Reverin itself without preliminary splitting off the side chain (Fussanger, 1958). It is soluble in water, 250 mg. dissolved in 10 cc. of redistilled water can be given intravenously in half to one minute, without damage to the vein. The solution at pH 5.2 is very well tolerated. Effective therapeutic level is maintained for 24 hours with a single injection of 250 mg; in mild and moderately severe cases a single injection of 250 mg. in 23 hours is sufficient. Once an ampoule of Reverin is opened it can be kept in a refrigerator or at room temperature for days without precipitation or loss of potency (Bohn and Koch, 1958).

The C.S.F. concentration of Reverin expressed as a percentage of serum concentration, gradually rises and ranges from 0.7% to 100%—the levels becoming equal about 30 hours after infusion. Intravenous injection gives higher C.S.F. concentration than the

*Specially contributed to the ANTISEPTIC.

intramuscular and repeated 12 hourly intramuscular injections give adequate therapeutic level (Dimmling *et al*, 1960).

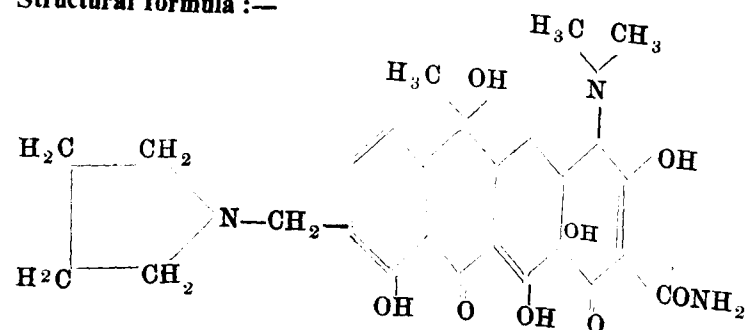
The drug is excreted into the biliary system. Cases of cholecystitis and cholangitis have been treated successfully by Bohn *et al*, but in view of the toxic effects of tetracycline on the liver in experimental animals, Reverin as any other tetracycline "should not be given to patients with definite signs of extensive liver damage" (Bohn and Koch, 1958).

After a single injection of Reverin, the urinary concentration within a few hours is 10 to 15 times higher than the blood-concentration; as the mean urinary concentration decreases more slowly than the blood concentration during the subsequent 24 hours, the urinary levels 8 to 24 hours after injection are 100 to 200 times higher than the blood-levels. (Strauch *et al*, 1958). Reverin has proved very useful in cases of chronic pyelonephritis and the blood-pressures in 29 out of 71 cases of hypertension associated with pyelonephritis came down to normal or near normal level on intravenous Reverin alone (Bohn *et al*, 1960).

The amount of Reverin excreted in the faeces after parenteral administration is small; with identical therapeutic action the amount of biologically active tetracycline in the faeces is only one tenth of that found after oral administration. 250 mg. Reverin intravenously and 500 mg. intramuscularly are each therapeutically atleast equivalent to 1000 mg. tetracycline by mouth (Marwyck, 1958).

Reverin forms small light-yellow needle-shaped crystals; its molecular formula is CHON with a molecular weight of 527.3. Structurally it is represented as follows:—

Structural formula:—



Material and methods.—Twenty one cases suffering from different diseases were treated with Reverin (See Table I, p. 869). All except three of them had had either penicillin, sulphonamide or streptomycin, alone or in different combinations; and some had had oral tetracycline, prior to Reverin therapy. Cultures of sputum, pus, urine, or C.S.F. whichever was indicated were made except in Case No. 8. The organisms isolated were *D. pneumoniae*, *N. catarrhalis*, *F. pneumobacillus*, *B. pyocyaneus*

N. meningitidis and *B. coli*. The pus was sterile in Cases 1 and 6. Reverin was given daily in a dosage of 250 mg. dissolved in 10 cc. of redistilled water intravenously. The number of injections varied. Blood examinations for T.C. and D.L.C. was done before and after therapy. Specific enquiries were made about any side-effect.

TABLE No. 1

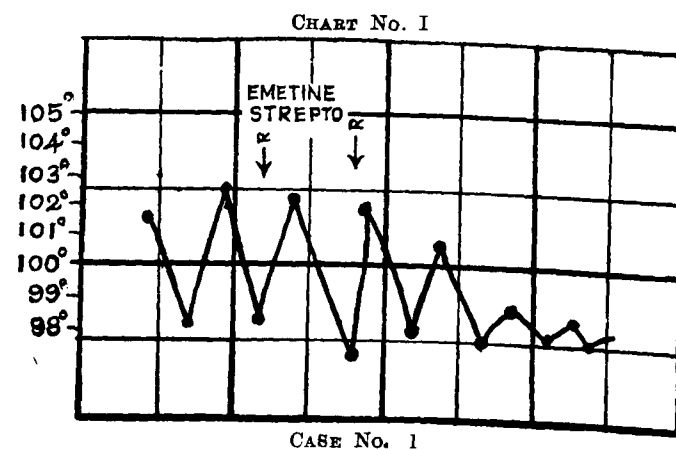
Liver abscess:—	
Amoebic-secondarily infected	1
Amoebic-secondarily infected with empyema and peritonitis	1
Asthmatic bronchitis with emphysema	2
Pneumonitis with inflamed narrowed bronchus	1
Pneumonitis? Viral	1
Bronchiectasis with emphysema	3
Pneumonitis	1
Cor-pulmonale (bronchiectasis, emphysema with heart failure)	3
Lung abscess with thickened pleura	1
Pneumonitis with diabetes mellitus	1
Pyelonephritis	1
Pyelonephritis with enlarged prostate, diabetes mellitus, uraemia, chronic bronchitis and emphysema	1
Cholecystitis with stone, undergoing malignant changes with metastasis in liver	1
Septicaemia with suppression of urine following prostatectomy and blood transfusion	1
Meningococcal meningitis	1
Encephalitis-viral	1
Total	21

Results and comments.—The results of treatment showing the salient features are given in Table II, on pp. 872-877.

It will be seen that Reverin was found to be a very useful antibiotic, and effective in quite a large variety of different diseases, many of which were not amenable to other treatments. Reverin was found to take sometime to cross the meninges and produce an effective level in the C.S.F.; a case of suppurative meningitis was treated successfully with Reverin 250 mg. intravenously once a day. Response to Reverin was satisfactory in encephalitis. In the two cases of liver abscess with sterile pus Reverin proved very useful, when preceded or followed by amoebicidal drugs. Effects on temperature recorded in four cases are shown in Chart I to IV, p. 870-871). The short case histories of four patients given below reveal some interesting points.

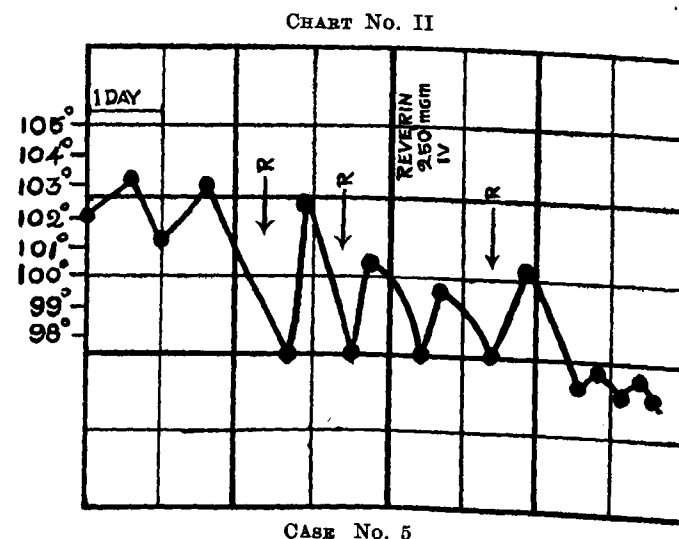
CASE No. 1.—D., male, aged 30 (Chart I), was admitted on 19-1-1960 with a history of pain in the abdomen, anorexia, irregular bowels and irregular temperature of one month's duration. On examination the liver was enlarged up to the umbilicus and was markedly tender. He was put on $\frac{1}{2}$ gr. of

emetine hydrochloride and 1 g. of streptomycin daily for ten days. During this period, 150 cc. of anchovy-sauce-like pus in the first instance and 50 cc. two days later, and were aspirated from the liver abscess. The pus was sterile on culture on both



mg. daily for two days was given *i.v.* The high temperature diminished on the 3rd and the patient became afebrile from the 5th day onward.

CASE No. 5:—B., female, aged 34, was admitted into hospital on 15-4-'60, with a history of irregular fever, very severe headache and vomiting of 25 days' duration. Some neck-rigidity was present. She was treated outside the hospital as a case of



day for three days brought the temperature down to normal. Fever however, relapsed one month later with reappearance of pus cells in urine. Reverin was not available for further therapy.

the occasions. Pain, tenderness and the size of the liver became less during this treatment but the temperature remained high and intermittent as before therapy. Then emetine and streptomycin were stopped and Reverin 250

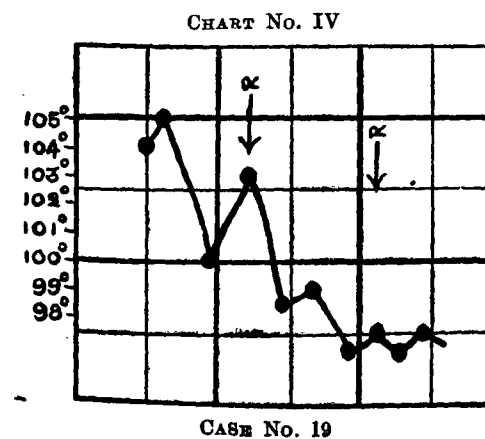
enteric fever with chloromycetin 1 capsule every 4 hours, for 7 days without any remission of temperature. In the hospital, the only positive investigation result was *B. coli* in the urine: Widal test was negative and C.S.F. was normal. Reverin 250 mg. *i.v.* every

CASE No. 6:—B., male, aged 26, was admitted into hospital on 19-3-1960 with pain in the right chest for 5 days, fever for 5 days and distention of the abdomen of two days' duration.

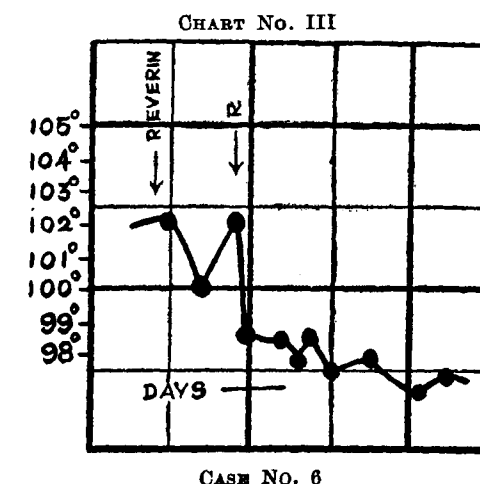
On examination, dullness on both sides of the chest, in the lower parts with distant breath-sound and markedly tender rigid and distended abdomen. The result of an enema was fair. Pleural aspiration, of the right side of the chest showed pus and of the left side showed hæmorrhagic fluid; culture was sterile. Reverin 250 mg., was given

i.v. for 3 days when the pain subsided, the abdomen became soft and less tender and the enlarged tender liver could be palpated; the temperature touched normal on the 5th day. About 280 cc. of anchovy-sauce-like-pus was aspirated from the liver, which was sterile on culture. Fourth injection of Reverin had no effect—fever intermittent in nature continued though the hepatic tenderness and abdominal rigidity and tenderness were less. The patient was then put on chloroquin sulphate and streptomycin. Temperature touched normal on the 4th day of this regime and the patient had an uneventful recovery.

CASE No. 19:—U., male, aged 59, was admitted into the surgical ward for urinary troubles due to enlarged prostate.



did not come down. Reverin 250 mg. daily given *i.v.* for three days brought down the temperature to 98°F.



Prostate was removed under cover of penicillin and streptomycin. Blood transfusion was given. Patient developed almost complete suppression of urine (1 oz. or so in 24 hours). The temperature shot up, became intermittent in type, associated with chill, rigor, sweating and severe prostration. Mystecilin V. 1 g. a day was given orally for three days but the temperature

TABLE II—Showing the salient features of the cases

Case No., name, age, sex, height, weight and date of admission	Diagnosis	Important findings and investigation results	Culture	Treatment before Reverin
1. D., 30, M., 5'82 lbs. 31-1-'60	Amoebic liver abscess? secondarily infected	150 cc. of pus aspirated from the liver 1st time—anchovy sauce 50 cc. aspirated 2nd time: foul smelling	Sterile in both instances	Emetine 1 gr. and Streptomycin 1 gm. daily for 10 days
2. G., 45, M., 5'4", 104 lbs. 6-2-'60	Pneumonitis right lower chest with cough and expectoration about 4 oz. in 24 hours. Occasional hæmoptysis	Bronchoscopic examination: R.L. bronchus narrowed, inflamed, full of foul smelling pus. Hæmorrhagic discharge wall thickened. No sign of growth. Aspirated material showed no malignant cells or A.F.B.	Sputum: D. pneumoniae and N. catarrhalis	Penicillin, Streptomycin and sulphonamides tried in various combinations
3. L., 35, M., 5'3", 88 lbs. 2-3-'60	Emphysema, bronchiectasis, anæmia and oedema of legs (nutritional)	Daily sputum about 15 oz. containing pus	Sputum: D. pneumoniae and N. catarrhalis	Crystalline Penicillin 5 lacs b.d. for 15 days, iron, vitamins, diuretics. Postural drainage.
4. N., 40, M., 5'3", 112 lbs. 16-3-'60	Emphysema, bronchiectasis	Daily sputum: 4 oz pus; cough specially on lying on left side. Harassing at night. Moist sound both lungs, more at bases	Sputum: D. pneumoniae	Crystalline Penicillin 5 lacs 1 M b.d. with sulphamezathine 2 tab. t.d. 7 days and postural drainage.
5. B., 34, F., 5'3", 102 lbs. 5-4-'60	Pyelonephritis	Fever remittent in type: 25 days	Urine: B. coli	(1) Chloramphenicol. (2) Urolucosil
6. B., 24, M., 5'4", 114 lbs. 19-3-'60	Liver abscess (amoebic? pus in the right and hæmorrhagic fluid left pleural cavity. Peritonitis	Continuous temperature acutely ill patient. Started with pain right lower chest. 5 days duration	Pus from liver and pleural cavities: sterile	(1) Streptomycin outside hospital, (2) after Reverin in the ward, Chloroquin and Emetine given
7. M., 55, M., 5'7", 122 lbs. 26-3-'60	Pneumonitis left lower chest	Fever 12 days with chest pain left side, laboured hurried breathing, cyanosis. Irregular pulse—acutely ill	Sputum: D. pneumoniae N. catarrhalis	Nil

and the results of treatment with REVERIN

Effect of treatment before Reverin	Reverin dosage and duration	Effect of treatment with Reverin	Total and differential count before after	Side-effects
Liver tenderness less, but did not completely subside; temperature intermittent up to 105°F. daily as before	250 mg. i.v. daily for 2 days no other medication	On the 3rd day height of temperature less and on the 5th day onwards normal temperature tenderness liver area: almost nil.	7000 8000 74, 22, 2, 2 70, 25, 3, 2	Nil
Though occasional lessening of symptoms aggravation occurred in a short time	250 mg. daily for 2 days; repeated 10 days later for 2 days again	With 1st 2 injections some improvement occurred; after 4 injections expectoration was nil but occasional cough persisted. X-ray chest showed diminished size of the patch but it persisted. Afebrile from beginning.	6200 9200 32, 50, 4, 14 62, 24, 4, 10	Sour taste after injection transitory
Oedema subsided but cough, expectoration did not improve, dyspnoea persisted	250 mg. i.v. daily for 2 days	On the 1st night of injection patient felt much relieved. Within a week's time expectoration reduced to nil; cough and dyspnoea slight	14200 4800 84, 10, 6 68, 28, 2, 2	Nil
No change	250 mg. i.v. daily for 3 days	Improvement marked in 3 days. Sputum reduced to ½ oz. in a day. Cough less. Could sleep at night undisturbed. Occasional moist sound at base.	6000 6000 55, 35, 6, 4 45, 30, 3, 2	Bitter taste temporary
After Urolucosil temperature became intermittent—109°F., vomited	250 mg. i.v. daily for 2 days. Omission 3 days, again 250 mg. 4 days	After 2 injection height of temperature was less. After the 3rd injection temperature was normal. Temperature relapsed about 1 month later with reappearance of pus cells in urine	8500 6700 54, 38, 5, 1 60, 34, 4, 2	Nil
(1) With streptomycin no response, (2) normal temperature with recovery on Chloroquine and Emetin, after Reverin	250 mg. on each of 1st, 2nd 4th and 10th days	5th day treatment temperature touched normal; patient felt and looked better. Tenderness liver area and chest wall less. Abdominal distention markedly diminished. From the 6th day, again fever intermittent, 4th injection had no effect.	20300 16000 80, 18, 1, 1 75, 20, 3, 2	Nil
Nil	250 mg. i.v. daily for 2 days. Sedative; Glucose and cardiac stimulants	Pt. felt better on 2nd day; on the 3rd day, temperature was normal, uneventful recovery	13000 5600 76, 20, 2, 2 70, 25, 3, 2	Nil

TABLE II—Showing the salient features of

Case No., name, age, sex, height, weight and date of admission	Diagnosis	Important findings and investigation results	Culture	Treatment before <i>Reverin</i>
8. S., 55, M., 5'4½", 106 lbs. 16-3-'60	(1) Cholecystitis: 20 years. (2) Now, acute attacks of right hypochondrial pain with rise of temperature 15 days. (3) Irregular tender liver with jaundice marked wasting anaemia malignant G. B. with metastasis in liver stone in G. B. and infection	Liver puncture: no pus	—	(1) Streptomycin and Penicillin: 10 days (2) Mystecilin B. 5 days
9. S., 79, M., 5'6", 140 lbs. 2-2-'60	Pyelonephritis with enlarged prostate, diabetes mellitus uraemia, emphysema, chronic bronchitis and hypertension	Irregular temperature in addition to other symptoms. Urine contained plenty of pus-cells and occasional sugar	Urine: B. coli	Penicillin and Streptomycin and Mystecilin irregularly. Insulin when necessary
10. G., 70, M., 6', 120 lbs. 9-5-'60	Cor-pulmonale	Bronchiectasis 8 years emphysema, dyspnoea 2 years. Occasional temperature 2 years. Cardiac failure 3 months.	Sputum: D. pneumoniae N. catarrhalis F. pneumobacillus.	Penicillin, aminophyllin digoxin and Diuretics.
11. N., 5., M., 1' 8½", 32 lbs. 16-3-'60	Lung abscess with thickened pleura: right side	Fever irregular ½ year foul smelling expectoration large in amount. Bronchial breath sound. Clubbing of fingers present. Mantoux test negative	Sputum: D. pneumoniae N. catarrhalis F. B: nil	Penicillin and Sulphonamide tried outside hospital
12. H., 67, M., 5' 11", 102 lbs. 8-5-'60	Cor-pulmonale	Bronchiectasis, emphysema 14 years, harassing cough with large purulent expectoration, dyspnoea	Sputum: D. pneumoniae N. catarrhalis	Penicillin and Sulphatriad outside hospital
13. S., 55, M., 5' 11", 138 lbs. 5-5-'60	Diabetes mellitus with a patch of pneumonitis, right midzone	Foul smelling expectoration with irregular fever: 1 and ½ months	Sputum: D. pneumoniae N. catarrhalis F. pneumobacillus. A.F.B. negative	Penicillin and insulin outside hospital

the cases and the results of treatment with *REVERIN*

Effect of treatment before <i>Reverin</i>	<i>Reverin</i> dosage and duration	Effect of treatment with <i>Reverin</i>	Total and differential count before after	Side-effects
In each case temperature responded but again relapsed	250 mg. i.v. for 2 days	Temperature touched normal and remained so for 4 days when the pt. expired. Complete assessment could not be done	19200 20200 75, 24, 1 85, 13, 2	Slight temporary headache
No response of temperature to streptomycin, partial to Penicillin and streptomycin	250 mg. i.v. daily for 7 days. Insulin when necessary	Temperature responded in 3 days time. Urine contained pus cells. 20 days later, temperature relapsed with reappearance of plenty of pus cells in urine	—	Nil
Harassing cough with purulent expectoration and dyspnoea persisted	250 mg. i.v. daily for 2 days	Improvement noted after 1 inj. After the 2nd inj., cough gradually diminished though persisted. Amount of sputum markedly less and it became mucoid. Lungs: moist sound few, rhonchi present	9800 9500 63, 20, 3, 14 58, 22, 6, 14	Nil
No improvement	125 mg. i.v. daily for 4 days	Marked improvement. Cough less but persisted. Sputum slight and mucoid in nature. Bronchial breath sound present about 2 months later the pt. was put on Sterodin and Terramycin, breath sound became vesicular. Cough subsided	8500 7600 40, 47, 6, 7 60, 35, 4, 1	Nil
Unsatisfactory	250 mg. i.v. daily for 4 days	From the 3rd day onwards, improvement was very conspicuous. Cough less, sputum markedly less and mucoid. Moist sound in lungs persisted though less.	10500 9500 45, 24, 6, 25 50, 28, 5, 17	Nil
No response	250 mg. i.v. daily for 4 days with insulin	Expectoration nil but slight cough persisted. Radiologically, pneumonic patch diminished in size-1 week later	14000 10000 82, 16, 1, 1 75, 22, 2, 1	Nil

TABLE II—Showing the salient features of

Case No. name, age, sex, height, weight and date on admission	Diagnosis	Important findings and investigation results	Culture	Treatment before <i>Reverin</i>
14. T., 45, M., 5' 10", 140 lbs. 26-3-'60	Pneumonitis right side? viral pneumonia	Fever 7 days with marked cyanosis hurried respiration. Patient acutely ill. Cough occasional without expectoration. Radiologically an area of consolidation right lower lobe	Nil	Crystalline Penicillin 5 lacs. 6 hourly for 4 days
15. P., 40, M., 5' 6", 90 lbs. 27-1-'60	Bronchiectasis with emphysema	Expectoration purulent and large amount associated with prolonged expiration and wheeze	Sputum: D. pneumoniae N. catarrhalis	Streptomycin 1 gm. b.d. with sulphamezathine 2 tab. t.d. for 10 days iodide mixture
16. A., 50, M., 5' 7½", 86 lbs. 27-1-'60	Cor-pulmonale	Chronic bronchitis with emphysema and heart failure. Sputum purulent	Sputum: D. pneumoniae N. catarrhalis	Streptomycin 1 gm. daily and sulphamezathine 2 tab. t.d. for 10 days
17. R., 24, M., 5', 94 lbs. 27-1-'60	Asthmatic bronchitis with emphysema	Profuse expectoration purulent with wheeze	Sputum: Str. haemolyticus. B. pyocyanus N. catarrhalis	Penicillin 10 days Chloramphenicol 7 days. Penicillin and Streptomycin 7 days with Aminophyllin
18. M., 33, M., 5' 3", 92 lbs. 27-1-'60	Chronic bronchitis with emphysema	Expectoration moderate, mucopurulent in nature	Sputum: N. catarrhalis D. pneumoniae	Streptomycin 1 gm. b.d. and sulphamezathine 2 tab. t.d. 10 days (2) Penicillin
19. U., 95, M.,	Septicæmia with suppression of urine following prostatectomy and blood transfusion	High intermittent type of temperature with chill and sweating	—	(1) Penicillin 5 lacs b.d. and Streptomycin 1 gm. daily for 6 days, (2) Mysterlin B. 1 g. daily for 3 days
20. O., 16, M.,	Meningococcal meningitis	Fever and neck rigidity with headache: 3 days' duration	C.S.F.: N. meningitidis	Nil
21. L., 24, M., 2-6-'60	Encephalitis? viral	Sudden onset of unconsciousness with groaning 3 days duration. Temperature remittent upto 103°F. No M.P. in thick-field. X-ray of chest: N.A.D.	C.S.F.: Slightly increased tension. Rest normal	—

the cases and the results of treatment with *REVERIN*—(Contd.)

Effect of treatment before <i>Reverin</i>	<i>Reverin</i> dosage and duration	Effect of treatment with <i>Reverin</i>	Total and differential count before after	Side-effects
No response	250 mg. i.v. daily for 3 days	Restlessness diminished. Pain chest less, cyanosis less. Patient felt better, slept well. Temperature diminished. Chest X-ray 1 week later size of the patch diminished	14000 13500 80, 16, 2, 2 78, 20, 1, 1	Nil
Some improvement: sputum less and less purulent	250 mg. i.v. daily for 3 days	Cough markedly less. Sputum small in amount, mucoid in nature	13400 8200 72, 18, 6, 4 65, 24, 6, 5	Peculiar taste in mouth
No perceptible improvement	250 mg. i.v. daily for 3 days	Amount of sputum much diminished, mucoid in character. Patient felt better	9700 8400 67, 28, 3, 2 64, 28, 3, 5	Nil
Some improvement seen	250 mg. i.v. daily for 3 days with aminophyllin	Improvement was conspicuous. Sputum almost nil. Cough greatly diminished. Lung fields: occasional moist sound	9500 7200 54, 28, 14, 4 58, 26, 14, 2	Peculiar taste in mouth
Some improvement	250 mg. i.v. daily for 3 days	Marked improvement: sputum almost nil	9500 7600 68, 20, 10, 2 64, 28, 2, 6	Nil
Height of temperature slightly less	250 mg. i.v. daily for 3 days	Temperature came down from 105°F. to 98°F. Relapse of fever 15 days later, but it was controlled on <i>Reverin</i> again	24600 93, 6, 1	Nil
—	250 mg. i.v. daily for 2 days. Interrupted for 3 days. Again for 10 day 250 mg i.v. daily	Headache, neck-rigidity diminished and temperature touched normal on the 3rd day of medication. Symptoms again relapsed with rise of temperature 2nd course <i>Reverin</i> completely controlled	—	—
—	<i>Reverin</i> 250 mg. i.v. daily for 3 days. Prednisone on the 2nd day evening. Periston-N i.v.	After 2nd injection the patient responded to question by protruding the tongue. Temperature: 99°F. After addition of prednisone patient responded to question, took semi-solid food. Having normal temperature after 3rd injection. Discharged cured	18200 96, 1, 3, 0	Nil

An almost anuric state continued for three weeks and the patient was put on Bull's regime. Relapse of temperature about a fortnight later occurred when he was put on Reverin. He recovered completely after a stage of diuresis continuing for about eight weeks. It is believed that the results obtained with Reverin in this series of trial cases could have been greatly improved with longer treatment in many cases.

Side-effects.—A peculiar taste in the mouth which some patients described as bitter or sour occurred in four cases and one had headache. These side-effects were transitory and did not necessitate stoppage of the drug.

No leucopænia, nor any adverse effect on the differential count of W.B.C. was noticed.

Summary.—Reverin is a broad-spectrum antibiotic effective in various diseases caused by tetracycline-sensitive organisms, not responding to penicillin, streptomycin and sulphonamide administered either alone or in various combinations. Reverin has proved effective in cases where oral tetracycline and chloramphenicol were ineffective; intravenous Reverin produces a prompt high blood-level which is an advantage. This high blood-level is responsible for the beneficial effects in the patients seriously ill or in cases of chronic illness which had had treatments of various kinds before. Reverin given intravenously produces no local side-effects like thrombophlebitis and hence is superior to other presently available intravenous preparations of tetracycline. Serious side-effects like enterocolitis were not met with. Though Reverin is said to take sometime to pass through the meningeal barrier, a few cases, (septic meningitis and encephalitis) responded very well to treatment.

Acknowledgement.—Our thanks are due to the Superintendent, Assam Medical College Hospital, Dibrugarh, to the House staff and to the Nursing staff as also to Messrs. Farbwerke Hoechst AG., Frankfurt (M), Germany who supplied Reverin for use in these trials.

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THE YES-MAN

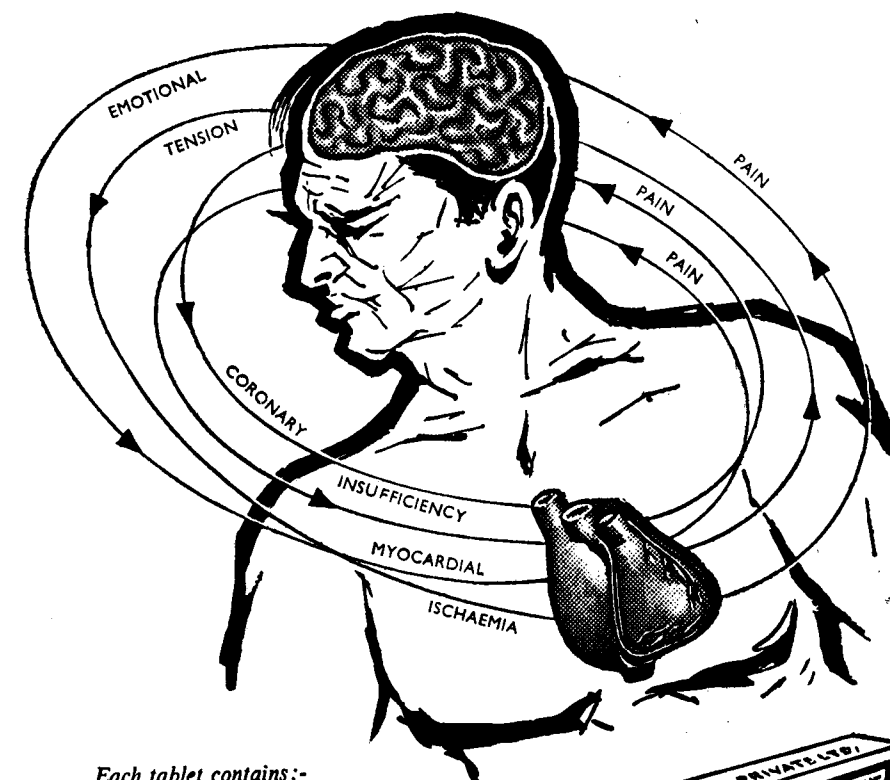
Independence and authority are both as necessary in medical practice as they are in any other aspect of human affairs. Authority without independence means slavery, independence without authority spells chaos. Authority founded on knowledge, conferred for a purpose and used for that purpose is the basis of organized society. Independence based on self-respect is the right of every member of that society, but independence may be surrendered for a time and for a specific purpose without any loss of self-respect. The antithesis of independence is not authority, but dependence, dependence of mind and spirit. The corollary of the despot is the yes-man.—('No miracles among friends' by Sir Heneage Ogilvie, F.R.C.S., M.D.).

Good News

FOR CORONARIANS

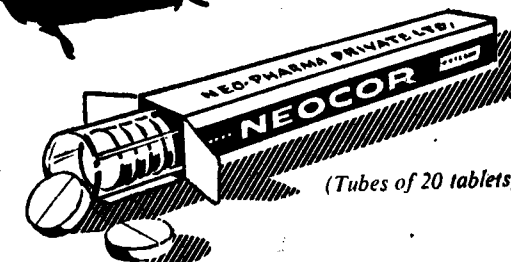
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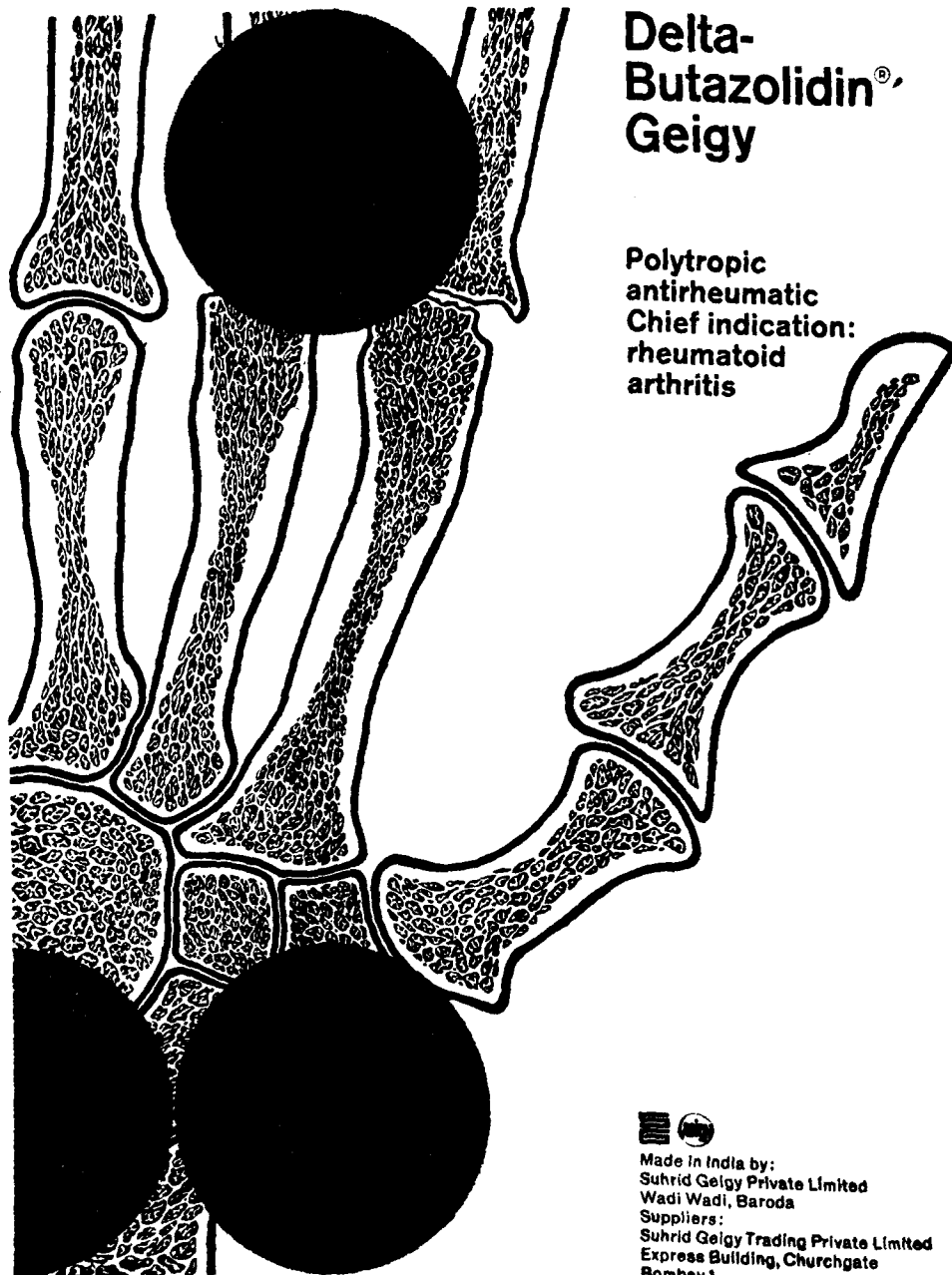
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THE NEUROLOGY AND BIOCHEMISTRY OF WORK (ADAPTIVE BEHAVIOUR) AND PLAY

D. SATYANAND, M.B.C.P.,

D.O.H., D. Psycho,

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Mental Diseases, P.O. Kanke, Ranchi

PLAY of animals and of men has been studied from many angles by various workers.

Play in animals is mostly innate and instinctive and also gives a chance to capabilities not fully developed, to mature. It is the execution of yet imperfect instincts. It may also be aimless movement due to surplus energy without an immediate purpose.

Professor Munro Fox¹ states, "We are on uncertain ground when we invoke pleasure as cause of play in animals." But the biologist will hesitate to say that animals lower than mammals with simple brains have pleasurable emotions. Do mammals like the leopard and birds like parrots play invented games? Some of the games of the monkeys and apes can be called intellectual. Two apes may combine to have a game together. Can it be that fishes also play?

The work of Lorentz² is relevant here. The work of Tinbergen³ may also be studied here. A study of imprinting is specially of importance.

Display is showing off, like the cock bird having taken possession of a territory, begins to sing to warn off trespassers. To an instructor a robin shows his red breast and assumes an attitude as if to attack. The trespassing Robin then retires. The display of mammy animals consists in posturing. Display actions are aphrodisiacs. Both male and female display, for example the hen in Robins solicits by sitting motionless before the cock. This posture acts as an aphrodisiac to the male. Communal displays are observed in some sea-birds.

Crabs and spiders also display and have territory rituals. Many birds bring nesting material to their mate.

Professor Munro Fox states, "display is quite instinctive."

When two barnyard cocks are threatening or fighting, they may intercept the fight and peck at the ground or make incomplete pecking movements. This activity may be called substitutive or displacement activities. Fishes show them too. The substitutive or displacement activities may consist of feeding movements, cleaning actions, sleeping, copulating, begging or nest building.

Professor Munro Fox states, "It looks to some investigators as if the cause of substitutive activities, in certain cases at least,

* Specially contributed to the ANTISEPTIC.

were an internal conflict between two contradictory impulses, drives or urges, call them what you will. We have seen a dog, threatened by a socially superior dog, both cringe and bark at the same time. It has internal urges both to flee and to attack. It seems that sometimes two such antagonistic drives result in a substitutive activity: the two incompatible urges of attack and fight cause the barnyard cock to peck as if at food.... May this not be parallel to the human lecturer who walks restlessly up and down, plays with his buttons or his keys, when he wants to explain something and is torn between the desire to put it more clearly and fancied inability to do so?"

Is this perhaps the same thing as play in animals: a carrying out of instinctive activities without their usual purpose? These substitutive activities of animals are inborn instinctive actions. But it seems that in some cases, in the course of evolution, a new purpose has been acquired for a substitute activity.

When this is attained, it may come to differ from the original action quite considerably. Such activities have been said to be ritualized. "Before copulation," says Professor Munro Fox, "Some kinds of geese make rapid stiff movements of the neck into and out of water. This serves as a signal of readiness to mate. It looks as if the movements had been derived from the action of collecting pond weeds, but have now become quite different from this, and ritualized.... Among insects, called empids a certain family of small flies, in which the male gives its mate a present before copulation."

Can we arrange these activities in an order, such as, play, substitutive activity, rituals and display? Yes; the above mentioned description leads us to choose this order.

What does the biologist mean by instinct? They are actions which are in-born and inherited. They are purposeful. Some instincts are perfect from the beginning, others improve with time. A lion cub gradually perfects its hunting instinct. Often hormones are responsible for the appearance of an instinct at certain definite times in the life of an animal. Instincts often appear one after another in a definite and in a varying order, as they live their short lives.

Professor M. Fox states, "There is a certain kind of beetle which ants rear to get its sweet liquid; they look after and feed the beetles' young, even though the beetle, destroy the ant's own brood. This is an instinct which may be said to have turned into a vice."

The parasitic cuckoo chick throws out from the nest the eggs or young of the faster bird but the latter go on feeding them.

These are perverted instincts.

The animal acting on an instinct has no idea of its purpose. They are automatic. Flexibility of instincts grows with evolution.

Beavers accomplish most astonishing engineering works by communal work.

There is an inborn urge in animals to copy one another. This influences us, human beings also. Professor M. Fox continues to say, "We ourselves are slaves to this when some one in a company starts to yawn and perhaps also when we walk in step with our companion..... In general, we may say, that the lives of insects are largely directed by instincts, in birds instinct is very important, but in mammals it takes a less prominent place. The lives of mammals are less rigid; each individual modifies its behaviour as a result of personal experience and thus acquires personality..... personality is individuality."

We can learn by imitation but the animals do not learn by mimesis. But chimpanzees sometimes profit by imitating their experienced fellows. We and animals can learn by avoiding previous mistakes after making mistakes.

There is a higher category of learning as in problem-solving. This is done by animals. Monkeys and apes can reason among themselves to a certain extent and have insight into a problem to some extent. It may also be kept in mind that we exaggerate the role of reason in human behaviour.

The role of instinct decreased as animals evolved; it is very small in man. The role of learning increased as animals evolved and is the greatest of all in man. Intelligence had just had its beginning in higher animals but is highly developed in man. Intelligence and creativity of man has increased with his historical development in anthropology. He uses reason the more as he evolves to the higher levels in anthropology. His beginnings were in animism and mythology. He is objectivated to rewards and most of the human beings live their lives in anticipation of going to a heaven after death. Man's progress as stated by Huizinga⁴ is an architecture of constellations built upon his play activities. The role of play in man is most important. Man is an animal who goes insane much more often and to deepest of levels of disintegration than any animal has done at any time. Man is the most sensitive and yet the most stable of all animals. Man can become a genius, an anticipator or prophet as well as a criminal and vandalist, of his own family and his own creative activity.

To study the biochemistry of instincts, play and work (adaptive behaviour) we have to investigate human genetics, cyto-dynamics and cyto-ecology.

Lorentz² in "*Evolution of Behaviour*," demonstrates that innate behaviour is a genotype and the expression of it as phenotype is on the same lines as that of any other genotype to phenotype. Say the genotype responsible for hæmophilia or blue sclerotics or the normal phenotype of the formation of normal hæmoglobin from its respective genotype. The expression of a genotype occurs to produce a phenotype early in embryology development and growth.

"Differences between phenotypes (such as our green and yellow leaved plants)," state Darlington and Mathur⁵, "may be due to differences between genotypes, to differences between environments, or even to differences in both acting together."... The phenotype is the product of reaction of the genotype and the environment."

Innate behaviour, may it be play, substitutive activity, rituals, display or instinct (educable or non-educable instinct) like the type of structure and form of the femur, tibia, tarsus or digits that an animal inherits in his skeleton, are inherited in the kaliedoscopic pattern of innate behaviour, by the usual mechanisms of heredity; the genes. The innate behaviour depends on the fixed neuronic paths, fixed patterns of neuro-cytoplasmic and neuro-cytoecology in that species of animals; with basic biophysical and biochemical processes depending on cytoplasm-nuclear membrane—nucleus system of cytodynamics and the nature of microsomes and enzymes in action.

A study of the system cytoplasm—nuclear membrane—nucleoplasm is relevant along with functional triangle of cytoplasm namely, infection-heredity-development.

Darlington and Mathur⁵ have pointed out, the important role of the nuclear membrane as the basis of homeostasis between the nucleoplasm and cytoplasm which are in continuous tension. The cytoplasmic genes called plasmogenes are in tension with the genes of the chromosomes in the nucleus. The plasmogenes tend to produce aberrant proteins capable of self-replication due to the two nucleic acids (mainly the RNA in cytoplasm). The aberrant production of new proteins may reach the integration of, so to say, foreign viruses in the cytoplasm. But the nucleus tends to control this aberration tendency. The aberrant plasmogene activity may be in the direction of "infection" as stated or in the direction of "development" in repair or in compensation on in kinetogenesis.

It may lead to avoidance of repetition if I express my hypothesis at this stage. This is as follows:

- (1) Work (adaptive behaviour) depends ultimately on para-activity of cytoplasm of the type of "developmental" polarity.
- (2) Play and play equivalents depend ultimately on para-activity

of cytoplasm of the type "infective" polarity. (3) One para-activity is convertible into the other para-activity and *vice versa*. The gradual transmissions from play to substitutive activity and from that level to ritualization, display and instinct have been studied already as stages in the utilization of para-activity in animals. Work in man is convertible into play and *vice versa* man, by volition. By ortho-activity of cytoplasm is meant that activity which is under the control of the nucleus through the nuclear membrane. It is the basis of routine behaviour, which, as studied here, is distinct from "work" on "adaptive-behaviour."

By para-activity of cytoplasm is meant the activity of cytoplasm which wriggles out of the control of the hereditary genes in the nucleus and is free activity of plasmogenes. This cytoplasmic activity has increased *pari-passu* with the higher levels of bio-evolution.

The triangle infection-heredity development is the range of differentiation-integration of cytoplasmic plasmogenes. In the pole "infection," viruses (endogenous viruses) may form and this role may end in disease and malignancy. In the pole "development" the plasmogenes may be over-active in quantity or quality in their normal specializing functions, say under the influence of environment as in kinetogenesis or in repair and compensation. Hereditary patterns (ortho-activity) of plasmogenes fulfil somatic role of organs.

Both these polar functions are the basis of play and work behaviour. The pole "infection" is the basis of death vector or death-instinct of Freud and M. Klien and of "sex-instincts." The pole "development" is the basis of life-vector or life-instincts or ego-instincts of Freud.

The activity of plasmogenes towards the pole "infection" may be called viral activity and that towards the pole "development" may be called developmental plasmogenic activity.

It may be recalled that both types of para-activity of cytoplasm are to be grouped under orthogenesis. The effect of the environment and not para-activity is kinetogenesis. Thus co-variant selection has to act on three factors as far as mental processes are concerned; two endogenous and one exogenous. Darlington and Mathur state, "The cytoplasmic system depends for its propagation largely (and originally) on ribose nucleic acid, which, not having the indefinite power of polymerization of its nuclear congener, cannot organize a differentiated fibrous structure such as a chromosome. The cytoplasmic units, are, therefore limited, in organization and size, corresponding in range to genes rather than to chromosomes. They depend, moreover on, chemical equilibrium; co-operation and competi-

tion, for the adjustment of their proportion and distribution. The larger and scarcer ones, or the ones associated with larger and scarcer corpuscles like plastids can therefore be accidentally sorted out. Again, the larger ones may be derived from the smaller ones; and both in the course of development, may be derived as cell products from the nucleus; and both may in and be lost. In these changes the cytoplasm is subject to the nucleus.

"It is also to a greater extent, than the nucleus, exposed to the environment and, of course, to the effects of differentiation. Lastly for their permanent transmission, cytoplasmic elements have another channel open to them than heredity: They can spread by infection.

"By this piracy they separate themselves, in adaptation and evolution, from the organism of which they form a part. And the same separation occurs when by mutation they come to multiply in such a way as to injure or kill their own mother body.

"Comparing the two systems, we have to wonder why the cytoplasmic system has decayed as mechanism of heredity step by step as development and differentiation grew stronger. Already in the higher plants, in the rogue, there is a conflict between the requirements of heredity and differentiation. And in the higher animals heredity has been reduced to complete, or almost complete, nuclear control. In this process the efficiency of the fibrous organization of chromosomes in the nucleus as a basis of heredity and of re-combination has given it a long term advantage over the cytoplasm. Only in the bacteria do we perhaps see an organization of life balanced between the cytoplasmic and the nuclear levels.

"Within the individual there are thus systems of different kinds at work in determining heredity, development and infection. In their foundations, as self-propagating proteins in cytoplasm, they are indistinguishable. But in their work at different levels of integration, each has its own rules of behaviour, and each is related to others by yet other rules of conflict and cooperation. With all these, the genetics of individuals is deeply concerned."

As pictured by Shrington⁶ and by the cyberneticists⁷ and in keeping with the scientific implied hypothesis that man is an emergence from the worlds of physics and chemistry with electronic, atomic and plasma physics as its basis and with play of molecules in the intermediary zone. When we fill in the findings of the study of animals and of heredity, as outlined here we get a more or less integrated picture of the physical-chemistry, physics and chemistry of behaviour.

There are various levels⁸: we are at present concerned with the level of cytodynamics, cytoecology and cyto-genetics in relevance to adaptive behaviour and play.

It is useful to estimate the magnitude and the complexities of this study. It is like a student of electronic physics trying to picture and understand all the electronic changes in the process of the production of a lunar racket and tracing the changes to its final end-point in the freedom once again, matter and energy, particles and waves.

The first stage in the demonstration of the authenticity and validity of the biochemical hypothesis is to show that behaviour learnt or innate, work (adaptive behaviour) or play, has cause-effect relationship with physiology as individual-in-environment in the time-dimension and that this is true about memory intelligence, learning, reasoning, imagination, thinking and volition, among some other higher attributes or properties of man. It is not necessary to go into the complication of whether body or mind is an epiphenomenon. The existence of a parallelism between them would be enough for this study.

The whole of the modern knowledge and information about body and mind without an exception has to be paraded before our minds if one is pressed for a demonstration to support the facts of physiological psychology and psychosomatics on the one hand and organic causes of psychopathology psychiatric conditions and psychotherapy, selection and guidance on the other. All are likely to agree up to this point.

Review of literature, the second stage of demonstration has been outlined, already, in brief. We have also to study whether the psychic apparatus is a replica of the mechanisms of the cells of that animal.

The next stage is to demonstrate an exact point to point parallelism or correspondence between work (adaptive behaviour) and play on the one hand and two para-activity patterns of plasmogenes on the other, namely life vector and death vector basis.

At the same time the inter-conversion of the two para-activity patterns at the cellular and organic level may be demonstrated to be parallel to the inter-conversion of adaptive behaviour (work) into play and *vice versa* at the behavioural level.

The latter may be attempted first. Finally, the hypotheses may be studied on the usual lines.

In a short article, a short-cut may be allowed to be introduced. Alexander⁹ in his article, "A contribution to the theory of Play" misses from my point of view, the hypothesis I have put forward only by a bare margin during the comprehensive body of the review, but is almost hard at the heels of the

hypothesis, in his almost by the way suggestion, for which he finds it fit to apologize, so to say. He states, "One is tempted to compare the relation between adaptive behaviour (work) and play with the relation between natural selection and mutation in biology. Mutation can be looked upon as a free and playful experimentation of nature with new, sometimes bizarre, combination of genes which in themselves are not adaptive but produce individual variations in the species, some of which by chance may have a survival value. These successful experiments are preserved through heredity" as play.

Mutations are to be compared with the discoveries, inventions, styles of living mutations in values and faith¹⁰ play is comparable to variations. This statement is based on a comparative and correlational study of details of mutations, and variations on the one hand and the details of creative inventions and play on the other. Creative inventions occur at the inter-conversions field of work into play and play into work. Once they are formed they recur till preserved and selected by nature in co-variant selection, sooner or later. That there are visible all forms of transitions between variations and mutations does not refute the fact of their different source of origin.

Play is para-activity an aberrant pattern in the sequence, order, rhythm and harmonics patterns of purposive activity. Like variations it comes and goes in changed patterns. In fact variety is the spice of life, in play.

The findings of the Objective Method of Dream—interpretations¹¹ of Nand point out that manifest dreams are accidents in the genesis of new attitudes and thoughts. Resolution of dreams occurs sometimes naturally and our second thoughts in the day are probably due to this unconscious resolution of dreams. Dreams are the *locus operandi* of work into play and play into work in the sleep wakefulness transitional phases. Day-dreams are more like pure play and so is routine literature and basic art in general. There is no hard and fast line. It may be restated that systematic creative work of fundamental nature, building wide bridges across wide gaps in human knowledge, wisdom and interpersonal relationships, is equitable to mutations in biology. The average adaptive behaviour on everyday creative work is in an equation with variations in biology, when variations are developmental adaptive compensatory and tend to renormalize. If the variation is destructive in its *modus operandi* it may be called play-equated. Alexander and others consider play as discharge of surplus energy.

Having fallen into the error of comparing play exclusively to mutations which are in equation to nuclear processes, instead of emphasizing their comparability to variations in the biological level which are based on cytoplasmic changes, the path of the

argument rapidity took the path of least resistance, that is, of considering inexplicabilities as equitable to the rudimentation hypothesis. The validity of the rudimentation hypothesis as such is not being evaluated here.

If play were merely the rudiments of innate phylogenetic traces of heredity and mutations, it is expected that it should share rigidity resistance to learning, resistance to imitation and other properties of innate behaviour¹².

I admit that an argument is not a demonstration. But an argument in the proper place and a colligation of known facts at the proper time may save an individual from fruitless repetition.

The whole of the argument put forward by an authority of the calibre of Alexander is worth reviewing in the light of this submission by me. It is largely an evidence in support.

He refers to the modern man as looking, "nostologically at the creative centuries of the past during which he still had the time and the detachment necessary for play and creativity." Modern man has in some cases work and play confused into a prison camp of everydayism or synthesized into a harmony in other cases, that the two do not exist in pure polarities of work (adaptational behaviour) and play, according to our definitions of work and play. Allen¹³ a genetist has propounded.

"Incomplete genetic stabilization resulting from the fact that phylogenetically the brain is one of the newest structures and is probably still in the process of rapid biological evolution."

This explains the difference between ancient man and the modern man which is half way almost between the ancient man and what we may say the total man.

Alexander's statements like, "Play is one of the important sources (though not the only one) of man's culture-building faculty," "the gradual rationalization and ritualization of the function of survival in society" "lends to our era its deadly seriousness," "play is now relegated to the special domains of sports....." are important landmarks in the inter-conversion of play adaptive behaviour and creativity.

His compassion of adaptive behaviour (what I have called work) with play, stating that while the adaptive behaviour is pedestrian play lends to an experimental connotation, emphasis on the genetic significance of play, the quotation, "Culture arises in the form of play and in the twin union of play and culture, play is primary," supports the hypothesis put forward as to the inter-conversion of the three types of behaviour.

Huizinga as quoted by Alexander emphasizes play contests. Those are the areas of the conversion of play into work (a sort of cold war of enhancing prestige) and work to play even to the

extent of "wholesale destruction of one's possessions just to show one can do without them" and "it is often clearly economically ruinous and as such strikingly non-utilitarian." This points out the parallelism between cultural advancement and life-vector *versus* death-vector activity in the race as re-emphasized by Alexander in, "That such originally playful contests may, in certain instances become an integral part of the socio-economic structure (for example, in the early phase of Western capitalism) and gradually lose their playful characteristics is not noted by Huizinga."

These arguments are carried on into the development of law and the origin of the significance of war, down the ages. Even in "pure" science there is the riddle-solving motivation for the mere sake of finding a solution independent of its utility.

Again reviewing the work of Gross, Alexander states, "The implication of this view is that playful erotic activities are primary in the ontogeny of each individual.... In playfulness, isolated faculties are practical and perfected, although at the time they do not seem to serve any utilitarian function."

Here adaptive behaviour and play in being inter-converted. There are *four* levels:—the routine behaviour, the adaptive behaviour, the individuality or anti-adaptive behaviour and creative behaviour.

The correlation of adaptive behaviour with developmental plasmogenic para-activity and that of play with viral plasmogenic para-activity can be observed directly in the teasing games or playful annoyance or playful aggression between friends and between one factor of personality having a laugh at the other factor within the personality, in relaxed state, with humour and jokes. The rules of the game are mainly on the principle of providing handicaps and compensation to each player. A great deal of effort goes into it. Then after that each game is an attempt to tickle, tease, contest and have so to say a mock self- or other-destruction activity, the sportsman-spirit. In play and in adaptive behaviour both, sadistic and masochistic activity are observed but in different constellations.

Kinetogenesis is at work mostly on the somatic functions of in-put, nutrition, inner-outer-world exchange, excretion, physiological homeostasis, coordination and control and defence of inner- and outer-world among other such physiological functions.

These somatic functions are represented in the central nervous systems as much as are the dichotomized erotogenous functions¹³. Having reasonably clearly observed that adaptive behaviour is based on developmental plasmogene activity of the cytoplasm, play behaviour is based on viral plasmogene activity and that life-vector and death-vectors are these basic polarity

of personality¹³ we may now study more in detail the mechanisms at work in cytoplasm-nuclear-membrane-nucleus structural set, as the basis of sublimation-individuals and totality genesis in man.

Gay¹⁴ states, "Present theories of cell physiology imply that materials are transported from the nucleus to cytoplasm. This transfer has now been demonstrated by means of electron microscopy.... That best judgement on this question, however, is still that of Thomas Hunt Morgan, the father of modern genetics, and also a pre-eminent embryologist. In 1934, he proposed that an explanation of the process of cell differentiation may be sought in a mutual interaction of the nucleus and cytoplasm involving reciprocal interchange of materials. Special regions and constituents of embryonic cells might thus react with the total gene complement to excite or inhibit the expression of the various potentialities carried in the genetic plan. One may, therefore, speculate in this vein. A special region in the chromosome of a cell, characterized by the composition of its DNA and associated RNA, (confers its specificity upon the section of nuclear membrane that forms the bleb. Our observation that the chromosomal region is rich in heterochromatin corresponds with Cospersson's suggestion that this substance, which has been found to contain both RNA and DNA plays an important role in protein synthesis.... The section of membrane released into the cytoplasm thus varies in accord with the specificity of the chromosomal region involved in its production. In the cytoplasm it becomes a cytoplasmic membrane, a carrier of a particular type of RNA designed to direct the synthesis of a specific protein. The cell is transformed in structure and function under the domination of a new biochemical process..... The mechanism observed in the fruit-fly may be only one of a number of possible alternative systems. It has given us a lead."

We have here a genetic plan with various potentialities in the nucleus of each cell. The cytoplasm in an expression, in an individual cell, only of a few of the genotype into phenotype. The rest of them lie almost in recessance or near recessance. There is a mechanism which allows the correlation, coordination and controls of the cytoplasmic expression and gene-potentialities. This is to be the nuclear study for work in this article.

Gay continues to state, "In general, it is proposed that RNA plays the key role in the elaboration of proteins in the cytoplasm and that it is the function of DNA (which is mostly in the nucleus) to preside over the synthesis of RNA in accordance with the genetic plan by chromosomes." It may also be remembered that radio-active studies indicate that RNA is produced in the nucleolus in the nucleus and then migrates into the cytoplasm.

We study here two mechanisms at work in the basic stages of behaviour as well as of the origin of species. The first one is that of the origin of and maintenance of mutations, which in terms of behaviour mean new patterns of creativity and scaleable cultural change in the biosocial evolution of man. There is the nucleus breaking down any aberrant cytoplasmic variation, there is the cytoplasm always tending to develop aberrant cytoplasmic variations and there is also the nuclear membrane which by its own lysis and plasia controls the relational activity of cytoplasm and nucleoplasm.

The role of membranes and their origin I find a very essential step in embryology and probably also in phylogeny. This is ultimately traceable to certain more obscure mechanisms. This mechanism of the origin of life is the second mechanism we study here. This study may be perused further. This in our established schema of the parallelism between behaviour and cytology, both in the unicellular and in the most complicated of all multicellular of animals, man, amounts to the origin of what I call archetypes, meaning thereby the very basic mutations or dichotomizations of biochemistry at the state of origin of life and the origin of proteins and genes, which are responsible for kingdoms, subkingdoms and phyla in biological evolution. This study concerns the origin of life and the origin of the genetic plan of chromosomes studied already. Work on genetic recombination is also relevant here.

The point to be inquired into with special interest from the point of view of psychodynamics is: Is there a cycle of activity between dialectic poles in the form of triangles and triunes, at the basis of origin of life and origin of mutations and species?

One of the Nobel Laureates in genetics Ledeberg¹⁵ states, "The harmology of genes and virus in their fundamental aspects also transferable from cell to cell by the intervention of phage particles.... The mutualism of DNA, RNA and proteins as just reviewed is fundamental to all contemporary life. Viruses are simpler as infective particles.... What would be the least requirement of primeval organism, the simplest starting point for progressive replication of DNA in terms of presently known or conjectured mechanism? They include at least.... In principle polymerized by a single enzyme... This is a far more stringent problem of the origin of life. These are of two kinds. The primeval organism could still be a nucleic cycle, if... Alternatively DNA has evolved from a simpler spontaneously condensing polymer. The exquisite perfection of DNA makes the second suggestion all the more plausible...."

"The nucleo-protein cycle is the climax of biochemical evolution. Its antiquity is shown by its adoption by all phyla. Having persisted for about 10 raised to the power 9 years, nucleo-proteins may be the most durable feature of this planet's geochemistry.

"...Nevertheless, the nucleic system illustrates the basic requirements for such a polymer. It must have a rigid periodic structure in which two or more alternative units can be readily substituted. It must allow for the reversible sorption of specific monomers, to the units in its own sequence. Adjacent sorbed monomers must then condense to form the replica polymer, which must be able to desorb from the template. Primitively, the condensation must be spontaneous but reliable. We may (at present) prefer to invoke somewhat cruder techniques of complementary attachment. The simplest of these is perhaps the attraction between cosmic groups of opposite charge, for example $\text{NH}_3^+ \text{COO}^-$ which are so prevalent in simple organic compounds....."

We find variations, mutations and archetype-genesis in cytology a cyclic process.

There is always a dialectic and an intermediary. This intermediary is a synthesis of parts of either of the poles of dialectic. Its genesis may not be studied here.

The intermediary undergoes lysis and plasia, differentiation—integration, centripetal-centrifugal processes. The nuclear membrane demonstrates this behaviour.

The poles of the dialectic are generally divisible into a lytic and a plastic pole, as broad general characteristics common to all biological dialectics. In the cytoplasm-nuclear membrane-nucleus there is the tendency of cytoplasm to undergo at random variations of extreme degree, a pattern plasia and there is the nucleus which is lytic in relation to this plasia. The nuclear membrane utilizes both the processes in selection. This selection is a fine tendril or projection of the natural selection of Darwin.

The basic to all this is the nucleoprotein cycle. The basic requirements of the polymer are also differentiation-integration, centrifugal-centripetal processes, lysis and plasia and make-break processes.

The nucleo-protein cycle as the intermediary mechanism with RNA mainly as productive and DNA mainly as lytic of RNA and of the over activity of plasmogenes from the basic cycle of lysis—cyclic make break-plasia. This is stated to be the basis of the origin and activity of life. DNA also appears to be involved in the synthesis of protein but then of the nucleus mainly with the nucleo-cytoplasm tension in our minds we can understand this, as an evidence in support and not against the

view put forward here. The origin of DNA and RNA are also cyclic.

Regression-progression, sleep-wakefulness, concentration-relaxation of attention, forgetting-remembering as well as adaptive behaviour and play are cyclic process in psychology. The adaptive behaviour activity and play activity interact and inter-convert each other. Art in industry is a common example.

To come back to the main point, we are studying, firstly, the cytoplasm-nuclear membrane-nucleous mechanism of the cell as the central dynamics of cell and cell ecology to study the mechanism of changes in the psychic apparatus, called play, routine activity adaptation creativity, sublimation and totality genesis. Secondly, we have to study whether the mechanisms of the psychic apparatus in man is a replica of the cell mechanism in him and how is it that the former is a replica of the latter.

In the first study we are building up with cytology as a unit of structure and function and are studying embryology and evolution in the anatomy and physiology of men and after all that we went to study the role of a cell in the psychic apparatus.

If man was a sphere consisting of mass of cells like atoms and molecules in a compound these demonstrations would not even have been called for. The origin through embryology of structure, order and arrangement as well as specialization and differentiation of cells is the screen which does not allow us, to get convinced of the relationship that is being studied¹⁶. The vitalist hypothesizes about the nature of man are also unconscious factors which shift and fragmentize our concentration on this pattern of thinking¹⁷.

It has been shown¹⁷ that the morphogenic and organ fields of the embryonic state are represented in the biochemistry and biophysical patterns of the neurones the fibres of which relay off afferent information for them. The first set of neurones has the second, third and so on higher levels of neurones. Thus organ biophysics and biochemistry is represented at various levels in the neurones system. To be more concrete, at the level of autonomic ganglia, in the spinal cord neurones, the thalamus level, the "visceral" brain level and still higher levels in the frontal lobes.

At each of these levels is a different code system in which the information from the somatic organs and tissues is available. What are these patterns of codes of information? How does the communication take place? How is one code of information converted into the other? These facts have been studied by cybernetics, in a general outline. But how does it occur exactly in this case is not yet fully worked out. It is only after this, that we may be able to realize how embryogenesis, structure, disease and mutation are interfered with or intensified, how

the whole of a metazoa becomes a replica of the "psychic" apparatus of a protozoa and how all this deep mechanism has been effected in the course of evolution.

Loeb¹⁸ states, that it is in the nervous system in its interaction specially with the endocrine organs, whose developments in the course of evolution has made possible, the greatest individualization. Increasing differentiations in the nervous system, in its cooperation with the hormone system, have made possible the coordination and correlation of the functions of the various organs and tissues belonging to the same..... Organ system and the function of various organ systems with one another; in this sense the nervous and the endocrine systems have made possible the integrated, very complex organisms which have gradually developed in the course of evolution.... Regarding the significance of memory in the maintenance of individuality in the psychical sense, the effect on the latter is imperfect and limited in time; it cannot fully function as the expression of individuality. There remains the third factor, the action of organismal and individuality differentials, which is completely characteristic of the individual and which maintains its identity in the organism; this factor then represents the essential individuality, whereas the first two factors merely support this individuality; each of these factors has passed through a definite evolution which we have correlated with the evolution of the other factors.

In the second study, we are merely setting up a theoretical scheme for the whole of the psychic apparatus, based mostly on the analogy that personality mechanisms were a huge edition of the cell mechanisms. We attempt to test this analogy by experiment and study of facts.

The work on psycho-dynamics by M. Klein and the author has definite indications. In all the fields studied the findings in psycho-dynamics point out that the model by Freud of man as an amoeba in water, with the amoeba under the ultra-microscope as studied here and with the micro-chemical, with micro-electrode points fixed in it and as a molecular and atomic field, is the correct model of the psychic apparatus of man¹⁶. This is true for the fields studied which are very numerous. Therefore, it is statistically valid to make a generalization and then use this generalization as the basis for further experiments.

Freud considered the psychic apparatus to consist of super-ego, ego and id, the super-ego always repressing the id, id and the unconscious returning as return of the repressed in dreams and neuroses as well as in errors of various levels, in day mentation. The conflict and tension were weighted mostly in this one direction. Ego psychology has restored the correlational and co-ordination functions to their proper place of importance.

M. Klein and others¹⁹ find that ego in relation with objects of the outer-world finds them as good or bad and build upon inner world also of good and bad objects.

Pursuing the first study I find²⁰ that dreams represent the conversion mechanism where adaptive behaviour (based on developmental para-activity) reacts with and even interconverts the individuating behaviour (based on viral para-activity) with the resultant creative behaviour or chaotic behaviour.

This requires classification to establish continuity with the rest of the contents of this article. Play has been equated to individuating behaviour; work had already been equated to adaptive behaviour. Adaptive behaviour is good play and individuating behaviour is bad play in the language of the infant, as he finds his organ-functions being conditioned in the cradle-set and the nursery, where he only knows acceptance or rejection as ego-mechanisms.

There is also the field of nurture, education and learning where good and bad play are interconvertible and react with each other; as in comparison of one with the other and selection. This is the covariant selection field and the field of originogenesis fields a stratum this covariant selection field becomes a stratum in the routine behaviour level. In the co-variant selection-field the ego develops its various differences and resistances²¹ along with its other global functions²². But weak or defective ego may break down into chaotic episodes of manifest dreams or the prolonged chaotic behaviour of the schizophrenics and other psychoses.

When it is realized that dream-work might have underlying bio-physico-chemical processes of the plasmogenes in cytoplasm, the expression of viral and adaptive para-activity and inter-conversion under the control of the nucleus, all the functions of the work on dreams by the author is observed to develop on complete parallel with the variations, distributions and time-sequences of the fluctuations of the bio-physico-chemical processes. The work on dreams by the author was published in 1947 and the parallel is being suggested only recently. It was only vaguely hinted at that time.

My findings that dream-work is associative as well as dissociative mechanism, centrifugal as well as centripetal mechanism with kinetogenesis (the super-ego of Freud) and orthogenesis (the id and ego of Freud) in the free interaction of orthogenesis with kinetogenesis patterns and constellation of bio-physico-chemical change in the individual-in-environment establishes the parallel with cytology. But Freud's schema is always keeping super-ego as dominant as a censor mechanism and always repressing. The admission of the return of the

repressed is so frequent that it needs reevaluation in a schema where id and super-ego are basically equipotential. In the schema of the normal man they are equipotential, sometimes kinetogenesis being dominant, at others orthogenesis being dominant. But in a kind of the neurotic kinetogenesis is persistently dominant, is admitted by me.

The same error leads to over-emphasis on sexuality. I also find that sexuality as symbols are the commonest type of symbolism—by far the commonest of all others. But symbolic sexuality is not to be confused with the biological sex performance. The distinction is often very delicate, indeed, but it is there and important.

The same error was the basis of his having to change the concepts of ego-instincts and sex-instincts to life-instincts and death-instincts and to have postulated an untenable hypothesis about libido as energy.

But by observing that bio-chemical reactions depending an enzymatic activity with law of mass action as its nuclear mechanism, is the basis of dream-work, a better observation of facts and their interpretation was made. This was supported by interpretation of other dreams. This is evidence for the conclusion that the parallel assumed was correct.

That structure of dreams is dialectic consisting of conditionings, identifications, introjections, motivations and of inhibitions, alienations, projections and schizomatizations is understandable in terms of the adaptive *versus* viral para-activity of plasmogenes, in the cells. The interactional field these dialect poles are observed to be in action, when the details, of the process of interpretation of dreams is recorded²⁰, there are associations as well as reminiscences, centrifugal and centripetal, associative and dissociative dream-smudges and dream-spaces.

In terms of cytological and cytogenetic chemistry and dream-work as observed by me consists of regression-progression or dreamatization elaboration in the longitudinal dimension in terms of ontogeny and consists of transfigurations of symbolizations and displacements in the transverse dimension between the objects of the outer-world and the inner-world with relational mechanisms as defences of the ego.

The important field of human activity in dreams as well as when solving-problems or attempting creativity is neither—pure play nor pure work as dialectics but the two are in gestaltic configurations in the civilized and free men, with sometimes play and at others work as the foreground. This is the covariant selection field where in biology natural selection and in man sexual and social selection, operates. This is supported by the work of M. Klein and by my work^{23, 24}.

In each case both for adaptive and play behaviour we are working in rectangles, that is, two adjacent triangles placed above and below. In adaptive behaviour the beginning and end are dominantly towards the routine behaviour end or apex of lower triangle. In play behaviour the beginning and end is dominantly towards the creative behaviour end or apex of the other upper triangle. Thus in adaptive behaviour we have a very clear-cut question or problem on a well outlined and clear-cut pattern of routine behaviour. In play there are previously created as clear cut as before, rules and engrams limitations and inhibitions as well as greater freedoms.

The para-activity of plasmogenes is work with two angles, in the rectangle, of pure adaptivity and pure individuality (freedom and adventure the adaptive and viral polarities of plasmogenes).

In abnormal conditions chaotic behaviour and loss of habitual routine behaviour occur.

Turning now to the second study, it may be stated that neither the conscious—unconscious, nor superego-id polarity is parallel to the cytoplasm—nucleus polarity of the cell, in a hypothetical schema. Attempts made previously on these lines have now been shown to be untenable. As attempts have already been made and are the main cause of anthropomorphic language in certain spheres of psycho-dynamics, this line of approach cannot be neglected but has to be re-investigated. My findings are, that if after all we have to draw a parallel between the amoeba in water and the whole of the individual-in-environment, a more workable hypothesis, so far, appears to me as follows: The nucleus is equitable in function to the central ego-field of the psychic apparatus, the nuclear membrane to the peripheral ego-field of the psychic apparatus and the cytoplasm to the relational world of the psychic apparatus.

Peripheral ego has been studied by Fairbairn²⁵ who finds it to consist of libidinous and antilibidinous factors or love and hate, internalizations and externalizations. I find integration differentiation²⁶ and centripetal-centrifugal process as basic in peripheral ego sphere of the apparatus. The mechanism of central ego has not yet been worked out by other workers.

The hypothesis submitted in this paper is that adaptive and play behaviour are due to para-activity of cell-cytoplasm, the ortho-activity of cytoplasmic plasmogenes being responsible for the routine behaviour and that after working through the related and coordinated with outer world stress and demands (kinetogenesis) as well as with inner world strains, and needs selection in animals and sexual and social selection in man, in the origin of creative behaviour of various patterns and levels.

Man's mind is worked by two psychodynamic hands, both under the control of the bio-physico-chemical but not so much in control of the biological evolution concretized in the genetic plan of the nucleus. The two hands may neutralize each other's products and we may have a tabula para again and again, both may work in alternation as adaptive or as individuating behaviour or both may correlate and coordinate in creative activity on the background of language and culture. The two hands may conflict or alternate in their nature and productivity in intense and acute form in psychopathology.

How this change has occurred in man is suggested as due to the gradient of evolution basically that plasmogenes appear and work more and more freely as evolution advances and due to graded neuronie pedomorphism as the higher centres are reached from the lower centres in the central nervous system of man, each having its own code of activity of plasmogene para-activity.

This complicated working central nervous system with an equally complicated somatic tissue system is the cause of man's differences with animals both in his body and mind, differences both advantageous and disadvantageous, but by cultural attainments, man has been able to make use of even the disadvantageous ones to his credit. The basic biological evolution in man has not always been towards a simple utilitarian struggle for existence, as portrayed by the Darwinists," said, Alfred Russel Wallace, the co-author of organic evolution²⁷. He continued, "Man, with the rise of the human brain had escaped from the specialization of parts towards which evolution seemed always to progress.....whole purpose of brain is to escape specialization.....Man, by contrast, could take off and put on.....Natural selection could only have endowed savage man with a brain a few degrees superior to that of an ape, whereas he actually possesses one very little inferior to that of a philosopher.

My basic biological finding, not worked through here, is that in man the biological evolution is based not on the somewhat rigid genetic schema but on the more basic molecular schema of physics and chemistry at the level of origin of life. This is operable in cytoplasm through plasmogene aberrations, but these aberrations are also under the control of the basic schema of the atomic model and relativistic wave mechanics, through the electronic theory of valency in molecular biology.

Conclusions and Summary.—In a comparative study of play behaviour and adaptive behaviour in man and animals the basic differences between these phenomena are observed and recorded as they occur in animals in comparison with what is the case in human beings. The characteristics in which man differs outstandingly from animals are studied and recorded. Recent work is reviewed. The recent work on genetics connects its phenomena with behaviour as far as its innate and constitutional factors are concerned.

The two patterns in which cytology plays its role in the determination of behaviour are described. In one pattern of study the whole of the personality is studied hypothetically in terms of its typical cyto-genetics and cyto-dynamics and the deductions are verified. In the other pattern of study the evolution and embryogenesis of structure and function are traced from the single cell and it is studied what role has a cell to play in this fixed architecture in determining the behaviour of the whole personality and how it comes about. Ultimately the viral and developmental vectors in the plasmogenesis of cytoplasm are observed to be the basic for the ultimate psychological dialectic of play and adaptive behaviour and of death-instincts and life-instincts in man. The RNA has two mechanisms which are biochemical basis of this dialectics. The biological and the psychological aspects of this hypothesis are studied in detail. The cybernetic finding is that body organs are represented in the nervous system at various levels in terms of different set of code systems at each level.

The implication of the neuro-biochemical hypothesis of man-animal distance of play routine adaptive and creative behaviour are studied in terms of human psychology and psycho-dynamics. A geometrical figure is suggested as a schema to represent the on-goings. The neurobiochemical basis of human psychology and psycho-dynamics is put on a more sound basis than has been done so far by cybernetics or other schools of physiological psychology.

The dialectic in man in terms of biochemistry is suggested. The difference between man and animals is suggested in a nutshell in terms of biochemical mechanisms of the nucleoplasm, cytoplasm and nuclear membrane of the individual cell and in terms of nucleic acid cycles in DNA or RNA mechanisms. This study when pursued further enables biologically trained general practitioner to understand the complicated phenomena of the human mind. The hypothesis put forward is original.

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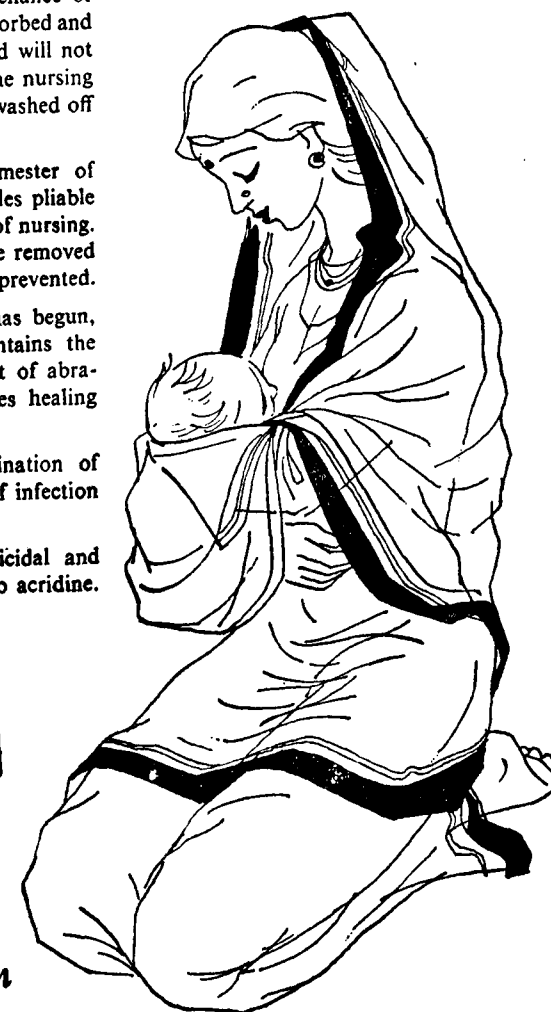
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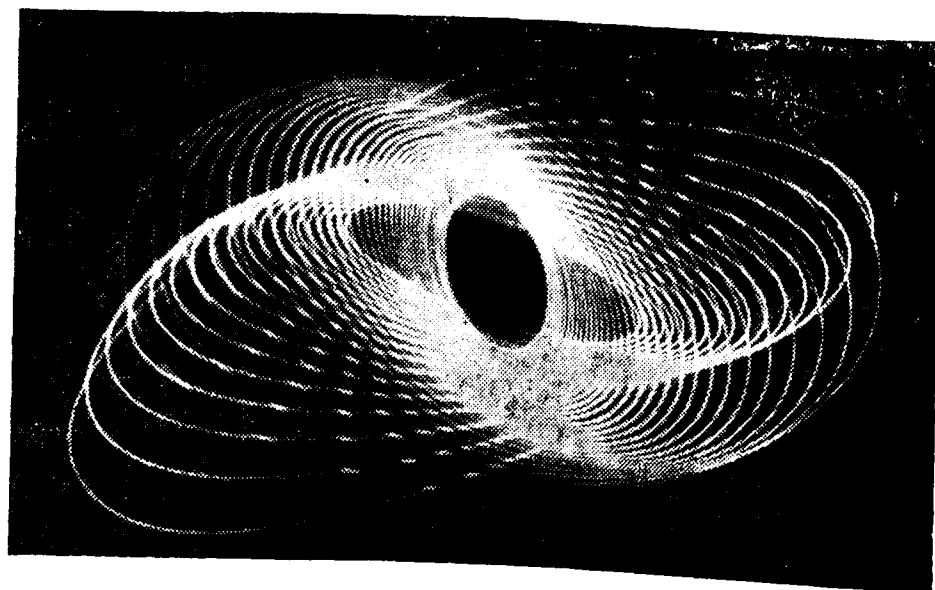
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THE INVESTIGATION AND TREATMENT OF A CASE OF STERILITY*

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STERILITY is a problem which faces every doctor. Almost every general practitioner comes across couples who have been married for a varying number of years and have had no issue. Issueless marriages are very incomplete and make very unhappy homes. In Western countries, it generally ends with disappointment to the couples concerned. But in India, where the customs are different, it causes misery specially to the woman. She is not welcome at any auspicious function and she is always blamed by the in-laws, for the bad luck she has presumably brought into the family. She is looked down upon by the other women and in general, her life and indirectly that of her husband, are made miserable. Also there is the question of the family property lapsing to reversioners in succession. I come across women—some of them with very sad stories—quite a few beg us desperately to do something to give them a child, though the husband is good and loving to her, the mother-in-law was looking out for another wife for her son. From time immemorial the reproach of barrenness has been visited upon the wife and the cause has been assumed to be some abnormality in her reproductive organs. So the wife gets the greater, if not the whole share of the blame for the tragedy of a childless marriage.

In our hospital (as in every other maternity hospital) where we come across women wanting children, and those wanting to limit their family, I think on an average for every patient who does not want any more children, there are at least 5 women who are eager to have children.

Sterility is best defined as the inability to initiate the reproductive process.

Sterility is of different types :—(1) Primary sterility, where conception has never occurred; (2) secondary sterility where there have been one or more pregnancies but further conceptions have not occurred. My experience is that most secondary sterility cases who come for treatment are those who have no boys, their only child being a girl. Most of them are keen on having a boy; (3) congenital sterility being the result of conditions existing from the time of birth or from early life e.g., absence of the uterus; (4) acquired sterility being the result of some condition which has destroyed pre-existing fertility and (5) voluntary (enforced) sterility resulting from the use of contraceptives for various social reasons (e.g. different nationalities).

* Specially contributed to the ANTISEPTIC

I propose to deal with primary and secondary sterility in this paper.

The causes of sterility are many and varied.—As already mentioned, the woman was always being blamed for sterility while the man was not. But luckily in recent years, this idea is gradually changing and we gynæcologists who deal with such couples almost daily, know well that the man may also be equally responsible for the sterility. So in every case of sterility, the man should be examined as carefully and in as great detail as the woman. I will not discuss about the investigations to be done on a man, as it is a matter for my doctor brethren to handle; but I may say that it should include a thorough physical examination of the man, with special reference to his genitalia, history of venereal disease, any injury, and a history of mumps in the past etc. The examination of semen should be done in every case of sterility. In our hospital, every woman who comes to be treated for sterility is asked to bring a report on the semen of her husband first. The 3rd wife of a man came to me for sterility. He had no issues by the first 2 wives who were alive and an examination of the 3rd wife revealed nothing abnormal but the husband's semen was found on examination to be totally oligospermic.

Quite often the husband feels greatly insulted, that a lady doctor should have ever thought that anything could be at all wrong with him; and some husbands flatly refuse to submit to this examination; and so the woman comes back with a message from her husband that he is perfectly all right and that she alone must be treated. It is however, amazing to find a large number of men who are either wholly oligospermic or have only very few healthy motile sperms in their seminal fluid. It is fair to assume that the presence of only 20% of abnormal spermatozoa can be ignored but anything like 50% or above is definitely the cause for sterility. One cannot of course go entirely by the negative findings in a single examination. Let me mention the case of a woman who came with a complaint of sterility; she had been married a number of years but never became pregnant. A physical examination on her showed nothing abnormal. The doctor who examined the husband found nothing wrong with him either physically or physiologically but the semen examination showed very few motile sperms and so I advised her to get her husband treated. The next day the woman returned with the photo of a child. Her husband wanted her to show it to me to prove that he was quite all right, as this child was the offspring of an affair of his with some other girl in the house whom the poor wife, to shield the husband had adopted as her own but the child died. We had to look elsewhere for the cause of sterility, if we were sure of the constancy of the girl he carried on with!

Disparity of age between man and woman is often mentioned as a cause for sterility. But this is not always true or correct. Quite often we meet with cases of old men of 60 and more marrying young girls, who may well be called their daughters or grand-daughters, and these girls straightaway get pregnant. An extraordinary case is that of a young girl personally known to me who was in her 18th or 19th year and was forced into marrying a retired old man of over 60, for the sake of his wealth. She had elephantiasis and the parents felt there was little chance of her getting a suitable husband. Before the year was out she had a baby and a couple of years later when he died, his property also! In every case of sterility it is, absolutely essential that the husband's semen should be examined microscopically by the doctor.

The commonest cause of sterility among women is an under-developed or infantile uterus. It is surprising that this condition is common even in women who otherwise look perfectly well-developed and healthy. Though this is no respecter of caste or creed, the condition is very much less in my experience among the non-vegetarians, *e.g.*, the Muslims and Christians and Westerners. Even sterility itself is much less common among non-vegetarians than among the strict vegetarians. Can it be that the higher protein in the diet plays a part in preventing sterility? The patient usually complains of scanty irregular m.p., or even amenorrhœa. On examination we find varying degrees of infantilism from, first a thickening in the pelvis where the uterus should be, to a tiny uterus.

A second common cause is blockage of the tubes due to infection, usually gonorrhœa. Other causes are tumours of the uterus, fibroids at the fundus causing blockage of tubes and tumours of the ovaries; tuberculosis of the cervix and endometrium is a much more common cause of sterility than is usually believed. The patient who had previously had a normal menstrual history, complains of amenorrhœa for varying periods at times varying for a month or 2 to as many years. She may have leucorrhœa. She has no constitutional symptoms, like loss of weight, fever etc. A speculum examination reveals a cervix which has the typical appearance and of course a clipping from the cervix or in the rare case of a T.B. endometrium a curettage clinches the diagnosis. We have had cases which came to us for sterility and irregular vaginal bleeding. On examination, the cervix showed an ulcer, which for all appearances looked like cancer of the cervix but a cervical biopsy showed it to be tuberculosis of the cervix and these cases responded very well to the usual anti-tuberculosis-treatment with streptomycin etc. Though I have found their m.p. come to normal I have yet to find one getting pregnant. Repeated tubal insufflations showed them to be irretrievably blocked.

Yet another cause of sterility is a very narrow and tight vaginal orifice. I have found this in a few cases where the couple had been married for more than 3 or 4 years. One often wonders if and how they were leading a married sex-life. In these cases the uterus and tubes were not abnormal; and very good results were obtained after surgically enlarging the vaginal orifice; they very quickly became pregnant.

Other common causes are:—cysts of the vaginal mucosa, which prevent conception by mechanical obstruction and inflammatory conditions of the cervix and vagina which are inimical to the activity of the sperms.

Lines of other investigations are:—(1) a detailed history-taking is essential: age at onset of puberty, menstrual cycle, any history dysmenorrhœa or of pelvic inflammation; (2) examination for any constitutional disease, anæmia and heart disease, as also a thorough examination of the pelvic organs; (3) a study of the cervix and the endocervical secretions is necessary, especially in cases where everything else appears normal. The endocervical mucus should be studied around midcycle as to its gravity, its viscosity and the presence of infection. Quite often a speculum examination reveals a thick tenacious plug of mucus fully filling the cervical canal. It is very easy to imagine that it would act like a contraceptive. Scanty secretion, usually obvious on inspection, suggests either hypoplasia of the endocervical glands or insufficient oestrogenic stimulation. Even the mildest infection can make the endocervical secretions hostile to spermatozoa. Cervical factors in sterility play a larger part than is commonly recognized. Hence the cervix should be examined in detail. In one case the external os was found closed by a tiny flap of mucous membrane, which was acting like an effective contraceptive diaphragm and completely blocking the entry of the sperms. Just snipping that flap helped the patient to get pregnant. Too short or too long a cervix can also prevent conception; (4) special tests to ascertain the patency of the tubes; the most popular and easiest to perform is the Rubin's test, which is best carried out about 5 to 6 days after a menstrual period and not too close to a period. The vagina and cervix are cleared of all mucus; the cervix is slightly dilated and the insufflator is pushed into the cervix and kept firm while the air is pushed in. Patency is indicated by a drop in the Hg. column as the air escapes from the fimbrial end, also by auscultating and hearing the air escape and thirdly by the patient, who when she comes round, complains of pain over the shoulder due to the escaped air irritating the subdiaphragmatic peritoneum. In cases of bilateral non-patency of the tubes, all the above three evidences are lacking. Negative results may be due to spasm of the tubes or to a fleck of mucus in the tubes. Hence the test

should be repeated several times at intervals. If persistently found blocked, a hysterosalpingography should be done, to locate the site of the block. On several occasions we have found that though negative at the first insufflation, they became positive on repeating. A few patients have become pregnant after the first insufflation. This is probably due to some mild adhesions inside the tubes which were released by the insufflated air.

During the past 2 years between June 1958 and July 1960 I have done D and Cs and tube-testing for a total of 201 cases of primary and 63 cases of secondary sterility. Among these, both tubes were patent in 179 cases; the left tube alone was patent in 10 cases; the right tube alone in 12 cases; the patency was doubtful in 14 cases and the tubes were not patent in 49 cases.

After locating the exact site of block after hysterosalpingography, a laparotomy may be considered. Very often we then find the tubes absolutely fibrosed due to some old infection. There may even be a congenital absence of a tube. Hysterosalpingography is the visualization of the uterine and tubal cavities, after the injection of a medium, opaque to the X-ray, generally a compound of iodine and oil. It gives certain information about tubal patency and differentiates line for bilateral obstruction. It will also locate accurately any point of obstruction and in that way shows what may be expected from surgical intervention. It may also show any uterine, hypoplasia and deformity, endometrial hypoplasia and neoplasms.

After opening, we test the tubes further by first injecting air from the fimbrial end with a syringe or by passing a fine probe. If fibrosed, the fibrosed bit is excised and the uterine end is brought near the ovary. In extreme cases where both tubes are completely fibrosed we attempted to graft the ovary into the uterus with no very promising or encouraging results. Gynaecologists have attempted to keep the patency of reestablished tubes, by passing a fine nylon suture through the abdominal wall and through the fimbrial end of one tube and into the uterus and on through the second tube and out on to the abdominal wall and keeping it for few days before removing it. I have little or no personal experience of this operative procedure.

Tests for ovulation:—The practical impossibility of determining directly whether normal ova are produced or not has led to its determination by doing a pre-menstrual endometrial biopsy and recording of basal temperature curves. The endometrial biopsy is best taken during the first 8 hours of the flow. In a normal case it shows secretory activity in its glands and predecidual changes in its stroma. Since both of these are results of progesterone stimulation, one may conclude with certainty that an active corpus luteum has been functioning. This fact offers presumptive evidence that a follicle has ruptured two

weeks previously, but it does not guarantee that a highly fertile or even a completely mature ovum was liberated. Abnormal biopsy findings may result either from disturbed hormonal balance or incapacity of the endometrium to respond due to hypoplasia or atrophy.

Basal temperature curves are made by recording and charting out daily rectal temperatures taken on rising in the mornings. Normally it remains at a low level during the first half of a cycle; around the 14th day before the next period is due there is a slight drop followed promptly by a rise of $\frac{1}{2}^{\circ}\text{F.}$ to 1°F. and this is maintained until the onset of the menstrual period. This thermal shift is indicative of ovulation. This test not only offers evidence of normal follicular functioning but also has the practical advantage of being able to know the wife's fertile period; curves that do not show a typical shift strongly suggest anovulating cycles.

TREATMENT:—Depends on the investigations and a careful assay of the results. Hypoplasia of the uterus and ovary is treated by hormones. Hypothyroidism of varying degrees are to be treated; displacement of the uterus especially retroversion is often mentioned as a cause of sterility. We have corrected a number of retroverted uteri both by pessaries and by ventral fixation with no very great success. The retroverted uterus plays an important part in habitual abortions and correcting this condition has certainly helped in prevention. Cervical hypoplasia and scantiness of secretions are treated with small doses of oestrogens. Chronic cervicitis, frequently responds to antibiotics *plus* cauterizations while a tight cervix and a pin-hole os need dilatation.

In genital hypoplasia large doses of oestrogen tend to promote the development of the uterus and the tubes. The under-developed cervix may respond and the secretions become normal.

In 3 cases of sterility of long duration, everything was found normal; the uterus was normal in size and function; the tubes were patent and the vagina and cervix healthy but still the women failed to conceive. They showed signs of subacute appendicitis and after removing the appendix all the three became pregnant; whether appendectomy should therefore be attempted when everything else appears normal is a matter for speculation and close watch in several cases.

Prevention of sterility.—Prophylactic treatment of threatened genital hypoplasia in adolescent girls is an important measure. This includes the best possible attention and care to general health and hygiene of the adolescent girls and secondly, attention to those who are retarded in development; thus a girl in whom a normal, regular and relatively painless menstrual habit has not become established by her 15th or 16th year needs

careful investigation. To let nature take its course in such cases, is to invite disaster in the shape of deranged genital function. The control of venereal disease is a major item in prophylaxis.

The chances of conception taking place are greatest in the earlier years. Hence childless couples should not wait too long before seeking help.

Very often newly married couples come and tell me that they don't want to have a child immediately and would I teach them the use of contraceptives? I invariably refuse to advise, because I have come across couples who start with contraceptives and later find they just cannot beget children. I think the use of contraceptives produces a low-grade infection of the genital organs and prevents conception or makes it difficult.

I always advise newly married couples first to lead a normal married sex-life, beget a child and then think of contraceptives if necessary.

THE SHOULDER-HAND SYNDROME

This syndrome, which is painful and disabling, consists of a "frozen shoulder" with atrophic changes of the hand and arm. Although the aetiology may range from postcoronary occlusion to cervical arthritis, the clinical features are the same. There is no single satisfactory therapeutic agent for treatment of this syndrome. The most effective measures are stellate block with procaine and the use of corticosteroids.

The cardinal symptoms are pain, disability, tenderness, vasomotor disturbances at the hand and fingers and often, patchy osteoporosis in the X-ray films at the humeral head or carpus. Atrophic, or dystrophic, changes and contractures occur in advanced stages.

These disorders are important in clinical practice, because they resemble the features of arthritis, gout and related conditions for which they may be treated ineffectively.

The *first* stage, usually three to six months, consists of painful disability of the shoulder preceding, sometimes accompanying or following, pain swelling, and limited motion of the hand and fingers at the wrists and digital joints.

The *second* stage, lasting approximately three to six months, is characterized by gradual improvement in the pain and disability at the shoulder and decrease or absorption of the swelling of the hand. This progress may go on to complete resolution.

TREATMENT:—Analgesics for pain, until the specific measures have taken effect, are desirable, such as salicylates, 6 to 8 g. daily in divided doses; codeine, or other narcotics, briefly for acute symptoms.

Sedatives, or relaxants, usually are indicated for these tense subjects; sometimes psychotherapy; a soporific at night.

Procedures *not* advocated are:—Manipulation of the shoulder under anaesthesia. Application of casts in the presence of neurovascular symptoms.

Treatment of choice:—The most effective measures at this time are stellate (sympathetic ganglion) blocks with procaine and corticosteroids of ACTH.

Corticosteroids in the form of prednisone or prednisolone, or any of the newer corticoids in equivalent dosage is similar to that in a patient with rheumatoid arthritis of the same severity. A daily amount of 30 mg. in divided doses is usually introduced at the start in a full-blown shoulder-hand syndrome, with an increase or decrease in the quantity every three to seven days according to the responsiveness of the symptoms. Minimum maintenance doses are continued for weeks or months until interruption is not followed by rebounding symptoms. The usual contraindications and precautions in the use of corticoids apply. If there is any uncertainty or hazard, stellate blocks should be employed.

Stellate blocks have the advantage of presenting no contraindications except hypersensitivity to procaine, even in the older groups subject to the shoulder-hand syndrome or reflex dystrophy. If there is no increasing responsiveness between infiltrations after three to four blocks, it probably is useless to continue. An average of seven serial blocks is required. We use the anterior paratracheal route, even on an ambulatory basis, with a starting test injection of 10 ml. of 0.5% solution, thereafter 20 to 30 ml. 1% solution, at intervals of twice a week, then once weekly.

Whether corticosteroids or blocks are used, complete recovery or great improvement occurs at the shoulder, hand and fingers in approximately one-third of the patients, appreciable benefit (especially relief of pain) in another 50%. Minor residual defects occur in an impressive number of patients, notably when they are seen after the early phases.—(*G.P.*, April, 1960).

CORTICOTROPIN AND CORTICOSTEROID THERAPY IN CHRONIC POLYARTHRITIS: SEVEN AND A HALF YEARS' STUDY

Patients with rheumatoid arthritis were treated with cortisone, corticotropin, and prednisone during 2 periods of 3 years and 9 months ending from 3 to 43 months; in the 2nd period 28 patients received continuous treatment for from 6 to 45 months. In 6 cases, treatment was discontinued because of complicating diseases, none fatal, possibly due to the hormone treatment. Of the patients in the 1st group, 12 are still under steroid treatment after 4½ to 8 years; neither hypertension nor glycosuria has developed. Marked osteoporosis was registered in 4 patients after 3 or 4 years of treatment; prednisone was withdrawn from 3 patients, and the 4th is receiving treatment with anabolic steroids. No manifestations of adrenal insufficiency due to the hormone treatment have been noted. The number of patients able to work increased from 4 to 27 in the 1st group and from 6 to 22 in the 2nd group. The authors conclude that some patients with chronic polyarthritis who fail to benefit from rest in bed and salicylate, phenylbutazone (Butazolidin), and gold treatment can improve on treatment with corticosteroids. A relatively small group of patients seems to be fitted for this treatment, which usually not considered until the disease has progressed in spite of other therapy, or because phenylbutazone or gold treatment causes complications.—(*Nord. med.*, 63: 11-15, Jan. 7, 1960, via *J.A.M.A.*, 18-6-1960).

The really idle man gets nowhere, the perpetually busy man does not get much further. But the man who has worked hard and long gains immeasurably if he is removed, even against his will, from the scene of his labours and compelled to pass some fallow months in fresh surroundings during which he can rearrange the impressions that have piled on one another in a jumbled heap, and can group his experiences into a coherent whole.—(*No Miracles among Friends* by Sir Heneage Ogilvie, F.R.C.S.).

ROLE OF ANTIHISTAMINES IN INTRAVENOUS PYELOGRAPHY*

INTRAVENOUS pyelography is a radiological procedure quite frequently followed in urologic roentgenology. This procedure is, however, not free from side-effects which may sometimes

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even be of a serious nature. It is not only important for the detection of calculi and structural changes of the urinary tract and of pathological abnormalities of the renal system but also gives a fair idea of the function of the kidneys as well.

When it was started for the first time in 1929 the preparations used in this test quite commonly produced severe reactions. Every attempt has, therefore, since been made to make pyelographic drugs safe and to produce best visualization and a minimum of complications at the same time. The ideal has still not been attained though the frequency of complications is much less. The most common side-effects of urography especially with the older preparations are severe pain in the arm and shoulder on the side of the injection but also nausea, vomiting and other allergic symptoms. The incidence of these reactions is said to be as high as 20 to 25% and occasionally severe reactions may occur, some of which may prove fatal. In this hospital the incidence of these complications was also in the neighbourhood of 20% and some years ago one case collapsed on the table and was revived only after great struggle.

It has been mentioned that antihistaminics administered a few minutes before the dye seem to prevent any allergic reaction that may otherwise occur. In this hospital, the Pot. Iodide sensitivity test has been carried out as a routine a day or two prior to the radiological examination. In my opinion this test has no value beyond possibly being of medicolegal importance and of drawing the attention to the likelihood of an allergic reaction. Nesbit (*A.J.R. and Nuclear Medicine*, October, 1958) is also of the opinion that the test is of no value and that reactions have been known to occur even in cases where the test was negative. He further goes on to say that some of the reported fatalities have occurred in test-negative cases.

Whenever available a test ampoule was given prior to injecting the dye. The dye was given as follows: 1 cc. was injected after which 1 or 2 minutes were allowed to elapse to see whether any reaction occurred before the rest of the dye was injected. The time taken for the injection of the dye was three minutes.

*Specially contributed to the ANTISEPTIC.

I have investigated 107 cases in which intravenous pyelography was done. The antihistamine used was AVIL (Höchst) which was given in this series intravenously in some cases and intramuscularly in some, depending on the general build of the patient in a dose of 1 or 2 cc.

As allergic reactions to the newer dyes are said to be less frequent, I have subdivided the 107 cases according to the dye used:—74 cases received Ioduron; 21 cases Urografin; 10 cases Triopaque and 2 cases Diodone.

CASES 1 to 7:—All cases were given Ioduron and received 2 cc. of AVIL intramuscularly five minutes before injection of the dye. No reaction after a test dose and after the dye occurred.

CASES 8 to 12:—All received Ioduron and were given one ampoule of AVIL (2 cc.) intravenously half an hour before the dye was given. There were no reactions.

CASES 13 to 40:—28 cases (21 cases with Ioduron, 6 cases with Urografin, 1 case with Triopaque) were given one ampoule of AVIL intramuscularly 4 to 15 minutes before the injection of the dye and no reactions occurred.

CASES 41 to 55:—These 15 cases received Ioduron and were given AVIL intravenously 5 minutes before the dye (13 cases: one ampoule, 2 cases: $\frac{1}{2}$ ampoule). In case 47 IVP had been done previously when the patient experienced palpitation and vomited. No reaction occurred this time after premedication of one ampoule of AVIL.

In case 53 a positive reaction after a test dose occurred in the form of a raised wheal at the site of the injection and causing headache and dizziness. After premedication of one ampoule of AVIL no reaction was seen in this patient.

CASES 56 to 107:—Of the total number of fifty-two cases, 26 received Ioduron; 16, Urografin; 9, Triopaque and 1 Diodone.

AVIL was given intramuscularly 3 to 30 minutes before the injection of the dye. In cases 69 and 91 (both with Ioduron) no reaction was seen after a test ampoule of 1 cc. but there were slight reactions even after premedication with AVIL.

Taking all 107 cases together irrespective of the dye used it will be seen that the incidence of side-effects was reduced after premedication with AVIL to 1.86%. Since it may, however, be argued that side-effects are less with the newer dyes than with Ioduron, the incidence of side-effects in the Ioduron cases was also much less than before, occurring only in 2.7% of the cases.

Conclusion.—Premedication with an antihistaminic, therefore, seems to be valuable and important in preventing or at least minimizing allergic reactions occurring after intravenous urography. In my series, AVIL gave satis-

factory results and in my opinion it is very reliable when given intravenously five minutes before the dye.

Summary.—Allergic reactions after intravenous pyelography occur quite commonly, i.e., in about 20 to 25%, and in this hospital also it was in the neighbourhood of 20%. Antihistaminic drugs are said to prevent or minimize such reactions and I used AVIL (Höchst) parenterally in 107 cases before the dye was given. The incidence of side-effects was thus reduced to 1.87% in all cases respectively, to 2.7% in the 74 cases in which Ioduron was used as the dye. AVIL given intravenously five minutes before the dye appears to be very reliable.

Acknowledgement.—I am grateful to Messrs. Höchst Pharmaceuticals Private Limited, Bombay, for supplying the AVIL used in the trials.

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SIGNIFICANCE OF MECONIUM STAINING OF LIQUOR

The staining of liquor amnii with meconium is generally considered to be an indication of foetal distress and therefore, of intrauterine anoxia. Dr. Wren of King Edward Hospital for Women in Perth, W. Australia reviews 194 cases of foetal distress in 5916 deliveries between July 1955 and December 1958. Of these meconium staining alone as a sign of foetal distress accounted for 118 (60 percent). Foetal distress according to the author comprised irregularity, slowing of rapidity of the foetal heart-rate or the passage of meconium in liquor amnii:

1. In this investigation, account is taken of the incidence of meconium staining of liquor in infants born after 34 weeks' gestation.
2. The perinatal loss associated with the passage of meconium (11.9%) is compared with that in infants not passing meconium (1.5%).
3. It was found that meconium staining by itself was associated with just as great a perinatal foetal loss as any other sign of foetal distress, alone or in combination.

This contrasts with Hellman's findings, for he found a combination of slow, irregular foetal heart rate with meconium staining to be associated with a 20% perinatal loss, whilst we found an over-all perinatal loss of only 12%.

4. In an analysis of the causes of the perinatal loss associated with meconium staining, it is seen that excess delay in delivery is one of the major factors that can be corrected. If delivery is not anticipated per

vaginum within four hours, then a Cæsarean section should be considered. If delivery is anticipated sooner, then no delay in the second stage should be allowed to occur.

5. In cases in which a long or difficult labour is anticipated, or if a patient has been in labour for some hours and the membranes have not ruptured, a rupture of the membranes should be performed to allow an earlier diagnosis of foetal distress.

Neonatal asphyxia occurred in 97 (1.7%) of 5707 live births (excluding meconium staining); and in 102 (70.9%) of 144 live births (all foetuses passed meconium).

6. In a case in which the membranes are ruptured and the head is deeply engaged, if delay or difficulty is anticipated, a Drew-Symthe catheter passed behind the head will allow a small amount of liquor to be withdrawn and inspected, and foetal distress can be again anticipated and treated if present.

7. As a great number of our infants who passed meconium showed neonatal asphyxia it would be wise to be extremely thorough with the resuscitation and postpartum care of the infant. Ideally, a pædiatrician should be available for resuscitation of these infants.—(*Med. Jour. Austral.*, 30-7-'60).

RESPONSES TO "PHYSIOLOGIC" DOSES OF FOLIC ACID IN THE MEGALOBlastic ANÆMIAS

In order to compare the therapeutic effects of folic acid in small "physiological" doses usually administered, the authors studied 5 women, between the ages of 51 and 84 years, and one 84-year-old man with megaloblastic anæmia at the Boston City Hospital. Using currently available laboratory criteria, an attempt was made to establish whether the underlying nutritional deficiency was of cyanocobalamin or of folic acid. Each patient received a course of small (physiological) doses of folic acid, 0.4 mg., being injected intramuscularly daily; this was followed by a course of larger daily doses of folic acid, 15 mg. being injected intramuscularly. Three patients were given a 3rd therapeutic course of 30 mg. of cyanocobalamin intramuscularly daily. Of the 6 patients, 3 with folic acid deficiency responded well to the small doses of folic acid without further response to the larger doses. The other 3 patients with cyanocobalamin deficiency and pernicious anæmia had little or no response to the small doses of folic acid, but responded well to the larger doses. The subsequent parenteral administration of cyanocobalamin during a 3rd therapeutic period had no further hæmatological effect in any of these patients.

These findings indicate that the usual therapeutic doses of folic acid exceed those necessary for replacement therapy and are inappropriate for use in therapeutic trials. The use of more nearly physiological doses of either cyanocobalamin or folic acid permits one to identify deficiencies of these 2 vitamins without the aid of elaborate biochemical or microbiological measurements. The observations made in the 6 patients substantiate previous evidence that the normal daily requirement for folic acid in adults is less than 0.5 mg. and suggest that this, rather than a larger amount, should be used in the prophylaxis of simple dietary deficiency. Patients with megaloblastic anæmia who fail to respond to physiological amounts given parenterally of either cyanocobalamin or folic acid, but who do respond to large amounts of folic acid, may be considered to have an abnormality of folic acid utilization, rather than folic acid deficiency.—(R. A. Marshall and J. H. Jandl., *A.M.A. Arch. Int.*, 105: 352-360, March 1960, via *J.A.M.A.*, 18-6-1960).

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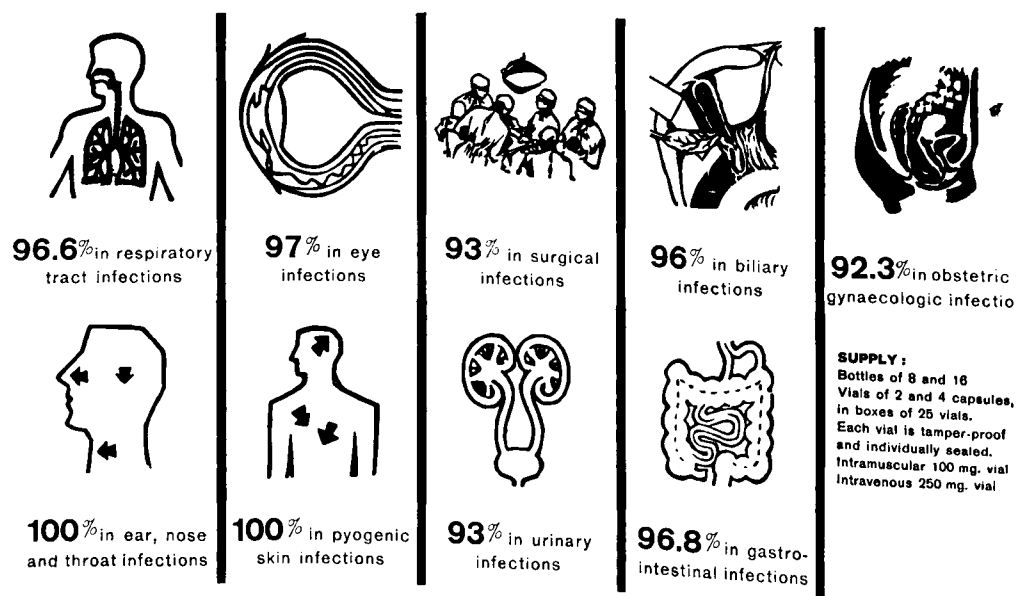
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MANAGEMENT OF PATIENT WITH PRIMARY CHRONIC GLAUCOMA*

PRIMARY chronic glaucoma is an insidious disease process which affects the eyes in a silent way, so much so that even an intelligent patient may not be aware of it till it has produced a marked degree of pathology. Aetiologically, whereas marked neuromuscular upset is the rule in primary acute glaucoma, sclerotic process in the eye as well as in the body as a whole, are the features in primary chronic glaucoma, and as males are more prone to the stresses and strains of life, the sclerotic processes are commoner in males and so the disease affects more males than females. Thus out of 232 patients with primary chronic glaucoma admitted in the ophthalmic department of M.Y. Hospital from January 1957 to July 1958, one hundred and thirty-five were males and 97 females.

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Head of the Eye Department,
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Age incidence:—54 were in the 30 to 40 years age-group; 94 in the 41-50 group; 61 in the 51 to sixty; 17 in the 61 to seventy and 6 in the 71 and above age group.

The 41 to 50 age-group was maximally affected; while 51 to 60 and 30 to 40 years came next in order; this is thus a disease of late middle life.

The visual acuity of the hospital type of patient, who presents himself perhaps for the first time, is comparatively poor. Out of a total of 448 eyes examined in the 232 admitted cases, the visual acuity was 6/60 and below in 335 eyes; 6/36 in 32; 6/24 in 25; 6/18 in 23; 6/12 in 16; 6/9 in 12 and 6/6 in 5 eyes.

The majority of the patients with primary chronic glaucoma we have to deal with in our country, possess visual acuity of 6/60 or less. This is perhaps due to the belief that the eye-patient should go to hospital, only when his vision has sufficiently deteriorated.

A tonometric examination of these 448 eyes, revealed the presence of tension below 25 in 77 eyes; a tension between 26 and 30 in 26 eyes; between 31 and 35 in 48; between 36 and 40 in 55; between 41 and 45 in 61; between 46 and 50 in 52; between 51 and 55 in 31; between 56 and 60 in 13; between 61 and 65 in 7 and a tension of 66 and above in 78 eyes.

Management of primary chronic glaucoma:—1. *Diet:*—In oedema, the sodium ion, as provided by sodium chloride is responsible for maintaining more water in the tissues; so is the

*Paper read at the Glaucoma symposium at the annual session of the Indian Medical Association, 1959.

case also with the eyes. So sodium chloride shall be reduced or eliminated from the diet and substituted by Pot. chloride. Fruit juices and vegetables should be reduced in quantity. Meat food increased, carbohydrates and fats being maintained in normal amounts. Vitamin C should be increased; coffee should be totally forbidden, as caffeine will give rise to increased tension.

2. *General* :—Constipation should be eliminated; emotion, anxiety and fatigue should be avoided, septic foci should be removed and the cardiovascular system checked and given medical attention if needed.

Darkness, *e.g.*, prolonged stay in darkened cinema theatres should be avoided and as also coloured goggles—as both these factors can produce a dilatation of the pupils and so increase the tension.

3. *Drugs* :—If the patient presents in the initial stages, when, for example, he complains of seeing haloes and on examination slight central field changes have occurred and tonometry shows diurnal variations, but no rise of tension, he should be given medical treatment. Such a patient should have frequent examinations, and his central fields should show no deterioration after medical treatment, and his tonometry should show no appreciable diurnal variations and the provocative tests should remain negative.

Such patient is ideal for miotic life, in which the sheet anchor is Pilocarpine nitras. It may be started from 0.25 to 0.5% and may be increased to even 5% in eye-lotion. The effect usually lasts for 6 hours. It may be used as eye-drops in the morning and at bed time and if need be also once at midday. Eserin salicylas is not used, because if this drug is indicated to control the tension, then the case is fit for surgery.

Several patients respond to this simple treatment of miotic life for several years. Here is an illustrative case:

A lady-teacher presented herself in 1949 with a complaint of seeing haloes and requiring change of her near glasses rather frequently. On examination, all the signs were negative, except the provocative tests. She was prescribed Pilocarpine lotion $\frac{1}{2}\%$ *b.d.* and was advised to visit us often. She was a regular visitor every six months and was doing very well on this simple treatment. In 1954, however, her central fields in both eyes showed definite deterioration and she was advised to undergo surgical operation, which she refused to have. At this time, her visual acuity was 6/6. (It may be emphasized here that visual acuity is no criterion for showing the progress of the disease). In 1956, in addition to her field changes her visual acuity also deteriorated to 6/18. In April 1957, she got an attack of primary acute glaucoma, and she submitted to an operation first in one eye and later in the other.

This case illustrates that for 5 years, she was doing well with miotics. At this stage when her fields deteriorated, she should have undergone surgery and avoided the further deterioration of vision.

Surgery.—Is indicated when:—(1) miotics do not avail; (2) fields show progressive deterioration; (3) tension shows a progressive rise and (4) well-marked signs like cupping of the optic discs and high tension manifest themselves.

Several types of surgical procedures are in vogue. In English speaking countries (including ourselves), the operation of trephining is popular. In Scandinavian countries, iridencleisis is the operation of choice and they do Lagrange's operation in France and its dependencies. The principle of all these operations is to allow the drainage of the aqueous in the subconjunctival space, where the conjunctival lymphatics absorb it. In another operation, known as cyclodialysis, the drainage of aqueous is carried with suprachoroidal space, where the choroidal vessels absorb it.

Out of the 232 admissions for primary chronic glaucoma:—trephining was done in 168 cases; cyclodialysis in 10; iridencleisis in 4; basal iridectomy in 15 and other measures in 28. Seven cases left against advice.

The chief complication was hyphema or blood in A. C. which occurred in 16 cases of trephining. In all cases it responded well to treatment. Other complications that occur may be immediate or late.

The immediate ones are:—(1) button-holing or tearing of the flap; (2) failure of iris to prolapse; (3) inability to replace the iris; (4) loss of vitreous; (5) damage to the lens and (6) falling of the disc in A. C.

The late ones are:—(1) late infections; (2) a closure of opening by the iris; (3) return of rise of tension; (4) hypotony; (5) cataract; (6) late iris prolapse and (7) detachment of choroid.

Cyclodialysis :—Is specially indicated in tensions below 40 mm. Hg., or in glaucoma in aphakia. This operation is undoubtedly much less radical and associated with less damage to the eye. The true action of operation develops gradually and appears as an evident lowering of tension. In typical cases, the tension sinks below the normal. In the majority of cases the increase of tension recurs sooner or later.

In iridencleisis :—A fistula is formed, the walls of which are covered with iris epithelium so that the opening does not close with non-filtering cicatricial tissue, as is frequent after trephining. As the conjunctiva is not undermined to the limbus, a large thin bleb does not usually form, as in trephining operation. Late infection is comparatively rare. The ciliary body is usually not touched as it is protected by the scleral spur.

Conclusion.—The old dictum that the "glaucomatous eye is a sick eye in a sick body" holds true even today. The possession of glaucomatous eyes is, no doubt, a life-long problem, because all operations undertaken for the treatment of primary chronic glaucoma are uncertain in their results. They may control the raised tension, which itself may or may not be the exclusive cause of deterioration of vision. If the dimness of vision is due to vascular sclerosis, the operation may not be of much help.

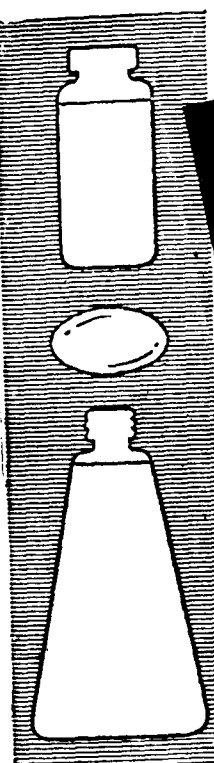
The prognosis depends upon the time factor. If the case presents quite early, miotic life may be quite useful for a number of years. We should not insist on the performance of a surgical operation at this stage. After all, surgery does inflict trauma on the delicate tissues of the eyes and the complications of any of the operations for the amelioration of the disease are not a few. But once there are definite indications for surgery, as explained earlier, there need be no hesitation in performing any of the well-known operations. The lack of control of the diseased process after performance of one operation should not cause a sense of frustration in the surgeon or the patient. Two types of operations may have to be combined or even repeated. Five or six trephining operations on the same eye have often been done. In Duke-Elder's words, "with reasonably adequate treatment some 70% cases of simple glaucoma do well in so far as they become stabilized, 20% deteriorate so slowly that they retain useful sight to the end, while 10% do badly."

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REGIONAL ENTERITIS

The clinical picture of regional enteritis is characterized by a long history extending over a period of months or even years. It is most commonly seen between the ages of 16 and 35 years, and is slightly more prevalent in males. The onset of symptoms is most often insidious, rarely abrupt. At times there is a marked resemblance of the sequence of events in the clinical picture of acute appendicitis. Other conditions commonly confused with regional enteritis are intestinal obstruction, chronic ulcerative colitis, or a fever of undetermined origin. Melena may occur if there is an extensive ileocolitis. Diarrhoea, abdominal pain and cramps, low grade fever that is intermittent, and a gradual weight loss are frequently encountered. The number of bowel movements is small in comparison to the frequent stools seen in ulcerative colitis. The rule that "frequency of faecal movements in inflammatory intestinal process is in inverse proportion to the distance from the anal sphincter" holds good. The abdominal pain is usually periumbilical, in the supra-pubic area, or in the right lower quadrant, often following meals and accompanied by borborygmi. The obstructive nature of the symptoms and signs correlate with the narrowed lumen of the ileum which radiographically appears as the "string sign." In selected cases the earliest manifestations may include the presence of fistulas, perirectal abscesses, abscess of the abdominal wall and fistula formation following abdominal surgery, or dysuria and passage of gas by the urethra due to enterovesical fistula.—(*Quarterly Bulletin, Northwestern Univ. Medical School, 34: 11, 1960, via M.D., June 1960.*)



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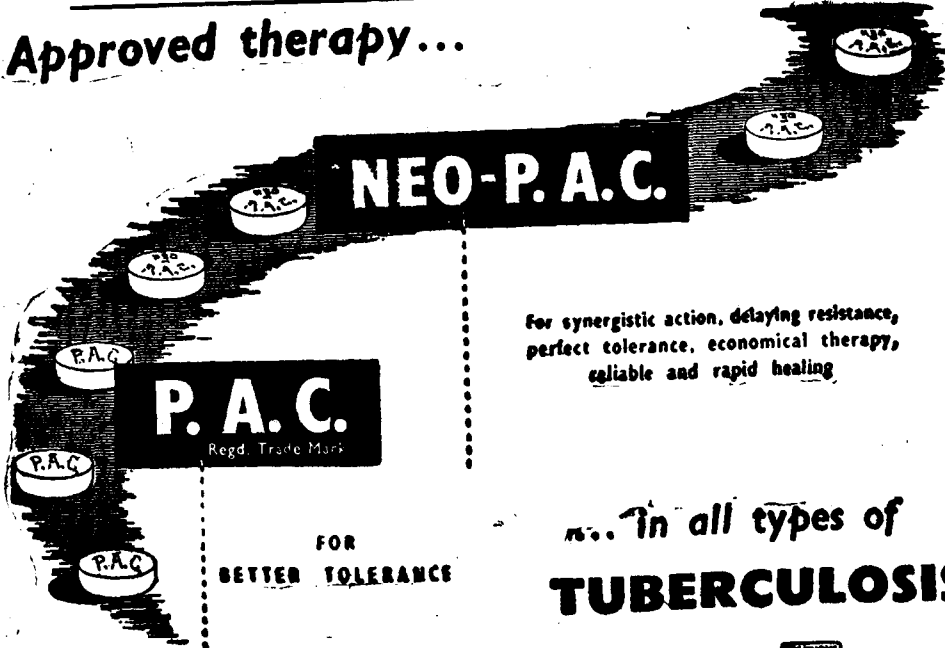
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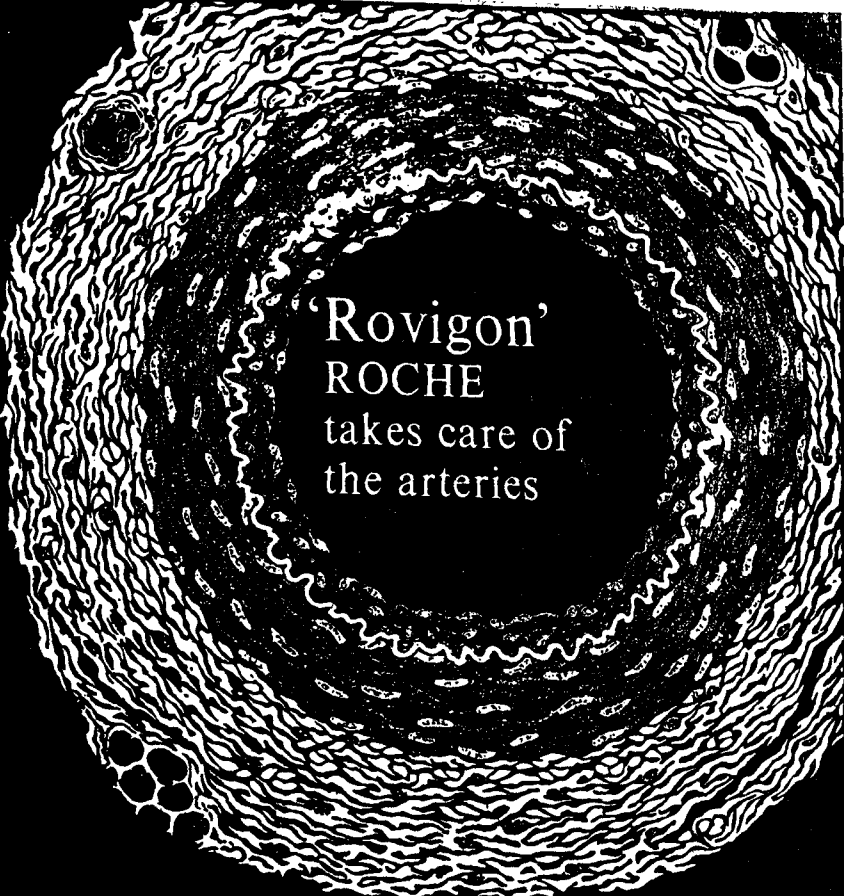
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THE MANAGEMENT OF ECLAMPSIA IN RURAL PRACTICE*

ECLAMPSIA is a toxæmia of pregnancy. It may set in during the late antenatal period, during labour or immediately after labour.

B. T. TRIVEDI, M.B., B.S., B.M.S.,
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In this article, an account is given of some of the cases of eclampsia treated in the Shri G. H. Hospital, Mansa, a rural but fully equipped hospital in North Gujarat. Ignorance still prevails among the villagers and therefore, the incidence of eclampsia, is high.

Aetiopathology.—Aetiology:—The precise ætiology of the condition is not known; but it is a fact that widespread spasm of the arterioles is the main cause for the clinical and the pathological findings. Several theories have been put forward regarding its causation:—

(1) *Hormonal imbalance*:—The posterior lobe of the pituitary gland is believed to produce increased amounts of pressor and antidiuretic substances in eclampsia cases. Sex hormones are also out of balance. An excess of A.P.L. hormone and a deficiency of œstrin in the plasma and pregnanediol in urine have been noted.

(2) *Toxins of the placenta*:—Placental toxins are supposed to be released by the chorionic epithelium. This theory is based on the fact that red infarcts have been found in the placenta of eclamptic women. These red infarcts are supposed to act as reservoirs for the toxins that directly cause the eclampsia.

(3) *Nutrition*:—Defective nutrition especially as regards minerals and vitamins e.g., calcium, Vitamin D and Vitamin B₁ has been blamed as also over-nutrition. Starvation and semi-starvation have been helpful in reducing the incidence.

(4) The theory of maternal autointoxication as a result of a breakdown of the general metabolism which was once considered an ætiological factor is no longer tenable.

Pathological findings.—These go hand in hand with the clinical findings, as the clinical features usually reflect the inner pathology. Most of the vital organs of the body are involved in changes of the degenerative type.

The kidneys:—Oedema and parenchymatous degeneration are evident even to the naked eye. Tubular epithelium shows cloudy degeneration with ill-defined areas of necrosis. Hyaline and granular casts block the lumen of the tubules. Glomerular capillaries are blocked or narrowed due to vascular spasms.

*Specially contributed to the ANTISEPTIC.

These changes are however, temporary because the kidneys return to normal when the patient is completely cured.

The liver:—The liver shows degenerative changes with hæmorrhages under the capsule and interstitial areas of necrosis are also noticed in sections.

The heart shows cloudy or fatty degeneration while the *brain* shows capillary hæmorrhages.

Clinical features.—When the medical practitioner is called in to treat, the woman in most cases is in an unconscious state in her late pregnancy with a history of convulsions. The woman goes into deep coma, soon after a few convulsions. These are epileptiform, tonic to start with and ultimately become clonic lasting for half a minute or so. I have seen a fatal case where the terminal convulsion lasted for about 15 minutes. The convulsions are so typical that if one sees the patient in such fits, he cannot miss the diagnosis. All the muscles of the body twitch and the tongue gets bitten between the teeth. The movements of the eyeballs during these fits, are typical and cannot be missed. Sometimes there is frothing in the mouth and moist rales are heard in the lungs and pulmonary oedema may develop.

During convulsions the respiration becomes hurried, the pulse becomes very rapid and the temperature rises to 101°F. or even higher. Oedema is another clinical feature usually seen in the extremities.

Blood-pressure is very high, both systolic and diastolic. In one of my cases it was so high as 220/170 mm/Hg. and still the patient survived.

Catheterized specimens of urine show plenty of albumin. In severe cases, the urine clots into a white solid mass on boiling. There may be incontinence or retention of urine during coma.

Primigravidae are usually affected more than the multigravidae though a good number of the latter have also been admitted with eclamptic fits.

The patient's relatives usually give a history that the patient did complain of headache, giddiness, dizziness and impaired vision for a long time before the convulsions started. A history of vomiting and passing of scanty urine may also be available.

DIAGNOSIS:—Diagnosis is very easy when the medical practitioner sees an unconscious woman with convulsions in her late pregnancy and oedema in the extremities or all over the body. Raised B.P. and the presence of excessive albumin in the urine are other important confirmatory findings.

Differential diagnosis should be made from uræmic convulsions, epilepsy, hysteria and convulsions due to cerebral lesions.

Uraemia.—A fruity odour in the mouth and previous urinary disease may be traced. Laboratory examination for blood urea gives a definite clue. It is otherwise difficult to differentiate between these two conditions, though the treatment is practically the same for both the conditions.

Epilepsy.—A history of convulsions in the past or a family history may be available. Absence of albumin in the urine in epilepsy is a very important point. Cerebral conditions and hysteria can be easily differentiated.

TREATMENT:—*Prophylactic*:—This is more important and here lies the importance of health schemes viz., the antenatal clinic. Antenatal care is most important. History of symptoms like headache, giddiness, dimness of vision and vomiting with clinical features like oedema over extremities with a substantial rise in B.P. and presence of albumin in urine are likely to be followed by eclampsia. If a woman is properly cared for in the pre-eclamptic stage, eclampsia is not likely to set in. All expectant mothers whether primi or multiparæ should regularly attend the antenatal clinic where they receive due attention and care. Family doctors should also watch carefully and take necessary preventive measures.

CURATIVE TREATMENT:—As soon as a diagnosis of eclampsia is made, the patient should be hospitalized and given suitable treatment.

Principles of treatment:—(1) Control of convulsions with powerful sedatives like morphia, largactil, paraldehyde and 50% Magnesium sulphate. (2) *Hypotensive drugs*:—Serpina, Serpasil, Serpirutin with C, Raudixin are the drugs commonly used. (3) *Diuretic action*:—This can be obtained with drugs like Diamox, Chlotride, Naclex etc. (4) Flushing of the kidneys and neutralizing the toxins with a good volume of fluids parenterally. (5) Nutrients like glucose, calcium, vitamin C, vitamin K, liver extract and vitamin B complex should be given. (6) Tiding over the crisis and helping in detoxication using cortisone, prednisolone etc. (7) Termination of pregnancy by surgical measures in emergency. (8) Oxygen in critical cases. (9) Nursing care, and (10) Morphia gr. $\frac{1}{4}$ should be injected immediately in order to arrest the convulsions.

I give 50 mg. largactil *i.m.* with good results, and no side effects. Paraldehyde 6 to 8 cc. may be given alternately or as desired.

Glucose 25% is given by the intravenous route:—

R Inj. Calcium gluconate 10% solution
Inj. Redoxon 500 mg. [10 cc.
Inj. Kapilin 1 cc.
Inj. Magnesium sulphate 50% solution [8 cc.
Inj. Glucose 25% solution 250 cc. by
i.v. drip slowly.

This should be followed by 100 to 150 cc. of 25% glucose with vitamin C and vitamin B₁ *i.v.* every 6 to 8 hours till the fits stop. Periston

N 100 cc. daily is given by *i.v.* drip with good results. Medicated nasal feeding is given two to three times a day using the following formula:—

R Diamox ... tab. 1
(1 tab. daily for 3 days)
Serpina ... tab. 1
Bidecortisyl ... tab. 1 (5 mgms.)
Glucose powder ... 3i
Plain water ad 3 ii to iii
Mft. medicated nasal feed.

These drugs are given till the B.P. comes to normal, the urinary flow is increased and the toxæmia is relieved and the patient becomes conscious. A smart purgative like 3i of Mist. alba should be given

immediately on admission by a separate nasal feeding.

I give 1.5 cc. each of liver-extract forte and vitamin B complex daily by injection and obtained good results.

Venesection may be employed when the B.P. is very high.

Surgical interference should be the last resort in critical cases. Forceps application and craniotomy are the usual procedures adopted. Great caution is necessary in surgical manipulations. Cæsarean section may be performed only in extremely critical cases, as risk to the life of the mother and the foetus is indeed great.

Nursing care.—This is very important. (i) A mouth gag should be kept in the mouth to prevent injury to the tongue during fits. (ii) Oral hygiene should be attended to properly. (iii) The body should be thoroughly sponged regularly. (iv) Bed-sores should be looked for and attended to promptly. (v) The bladder should be catheterized when retention of urine is present. In incontinence, an indwelling catheter may be kept and the clothes frequently changed. (vi) T.P.R. should be taken every 4 hours and if anything untoward is noticed by the nurse in charge, the same should be immediately reported to the doctor.

Complications—(i) Pulmonary œdema:—This is the most dreaded complication. If the convulsions are frequent and sustained this complication usually sets in very early, and causes even fatalities. When such a complication arises, oxygen must be given immediately and then continued with suitable breaks. (ii) Cerebral apoplexy is yet another but rare complication due to greatly increased systolic pressure in young patients. It is usually fatal.

Prognosis.—Is not bad if cases are seen and treated early. (i) The maternal mortality rate varies from 20 to 30%. The earlier the patient gets treatment, the better is the prognosis. (ii) Eclampsia in multiparæ has a better prognosis than in primiparæ. (iii) Results in cases of eclampsia occurring in postnatal period have been very good. (iv) Prognosis is poor is very low; also when the urine is loaded with albumin.

TABLE I—Case Reports

S. No.	Age in years	Parity	Appearance of convulsions during	Presence of œdema, and the site	Blood pressure mm/Hg.	Albumin in urine	Admitted after how many convulsions	Result
1	20	Primi-para	Antenatal period	All over the body	135/100 mm/Hg.	++	(1)	Cured
2	16	Primi	Antenatal	Legs	150/120	++++	(3)	"
3	28	3rd	do.	Legs	145/90	+++	(5)	"
4	20	Primi	do.	All over	150/100	++	(7)	" (Craniotomy done)
5	20	do.	do.	All over	160/110	+++	(1)	Cured
6	22	do.	do.	Absent	180/110	++++	(8)	"
7	20	3rd	Post-natal (2nd day)	Absent	160/95	++++	(6)	"
8	22	2nd	Antenatal	Absent	160/100	+++	(5)	"
9	20	Primi	do.	All over	220/170	++++	(12)	Died of cerebral apoplexy
10	20	do.	do.	Slight in legs	185/120	++++	(3)	Cured
11	20	do.	do.	Legs	190/115	++	(4)	" Delivered with forceps
12	22	do.	Post-natal (soon after labour)	Legs	144/110	++++	(8)	Cured
13	16	do.	Antenatal	Legs	125/80	+++	(15)	"
14	20	do.	do.	Legs	160/80	++	(2)	"
15	21	2nd (had eclampsia during 1st pregnancy)	do.	Legs	180/110	+++	(10) Each lasting for 3 minutes)	Died of pulmonary œdema
16	17	Primi	do.	All over	200/150	++++	(7)	"
17	23	2nd	Immediately after labour	Slight in legs	220/170	++	(4)	Cured
18	30	5th	do.	All over	180/130	++	(30) Lungs severely congested)	"
19	25	3rd	do.	All over	150/125	+++	(3)	"
20	30	3rd	Antenatal	All over	180/150	++++	(5)	"
21	26	Primi	do.	Legs	164/118	+++	(4)	"
22	19	Primi	do.	do.	158/114	++++	(7)	"
23	26	2nd	do.	All over	172/124	+++	(9)	"
24	18	Primi	do.	All over	170/116	++++	(6)	"

CONVULSIONS:—In one case, the patient survived even after 30 convulsions; albumin in urine:—+ moderate, ++ more, +++ much more, ++++ loaded.
Percentage results in the first 24 cases: successful in 87.5%.

(v) Patients with other systemic diseases *e.g.* myocarditis, chronic nephritis show a bad prognosis. (vi) The earlier the patient develops pulmonary oedema, the worse are her chances of survival. (vii) Persistence of eclamptic fits even after the third stage of labour is usually not good prognosis.

The patient usually dies of exhaustion, cyanosis, severe convulsions, pulmonary oedema and heart failure. The patient may also die of cerebral hæmorrhage.

Acknowledgement.—I am thankful to Dr. R. N. Manchandia, the District Health Officer, Mehsana for kind permission to publish this article. My thanks are also due to Dr. M. B. Hanse, Dr. D. H. Mehta, Dr. S. V. Mohile, Dr. M. V. Soneji and Dr. H. G. Joshi for their helpful guidance.

REFERENCE:—Eden and Holland's Manual of Obstetrics.

A SPECIFIC FOR RELIEF OF PAIN IN BILIARY DYSKINESIA

During the period between 1920 and 1930, the time of my medical training, internship, postgraduate work and early years of practice says Dr. G. W. Parson, M.D. of the Southern Clinic in Texas apomorphine hydrochloride was used for hysteria or acute alcoholism. Given with due precautions, it was meant to induce vomiting.

During the early 1930's I repeatedly saw a young woman who had central nervous system syphilis without objective findings except positive spinal fluid, and who had had a cholecystectomy. This patient had episodes of severe upper right abdominal pain, unrelieved by morphine in doses of $\frac{1}{4}$ to $\frac{1}{2}$ gr., but relieved almost immediately by $\frac{1}{40}$ gr. of apomorphine hydrochloride given subcutaneously and without emesis. The patient would be relieved and asleep before I could return my syringe, medicine, etc. to my medicine bag. Not infrequently I felt concern because of the sudden relief of pain and the deep sleep. At this time I had not heard of biliary dyskinesia, and I failed to grasp the significance of this relief.

Some years later I was confronted time and time again with the problem of relieving the severe pain of biliary dyskinesia in a member of my family who had had a cholecystectomy for a single gall-stone. The syndrome of biliary dyskinesia was well known then. The milder episodes were relieved by nitroglycerin under the tongue, but when this failed many other medicines were tried, which, up to that time, included Demerol and other narcotics, antispasmodics in all available forms, calcium intravenously, etc., without avail. Finally, and I am unable to recall why, except that I must have remembered the young woman above discussed, I gave this patient apomorphine hydrochloride, gr. $\frac{1}{40}$ subcutaneously. Relief of pain was almost immediate. She has since received apomorphine a number of times, perhaps six or eight, and it has never failed to relieve the pain, usually without causing vomiting. Occasionally one small emesis has occurred.

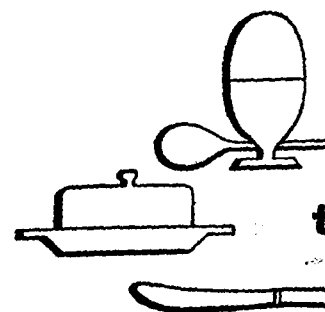
Two other patients who have had less frequent and less severe episodes of biliary dyskinesia following cholecystectomy for stones have received the same relief from $\frac{1}{40}$ gr. of apomorphine hydrochloride given subcutaneously.

Wherever these patients go they take apomorphine hydrochloride with them, with instructions for its use.—(*Ann. Internal Med.*, February 1960).

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A VALUABLE ADVANCE IN THE DIAGNOSIS OF MILD AND HIDDEN DIABETES*

THE usual tests for determining diabetes are: (a) detection of sugar in the urine, (b) finding a rise in the blood-sugar level after overnight fasting and (c) a marked rise in the glucose-tolerance curve.

The presence of sugar in the urine can only give an indication or a suspicion to the possibility of diabetes mellitus. For the determination of glucose concentration in blood the individual should have a full carbohydrate diet at night and is then fasted for at least five hours before the blood specimen is obtained for test. Usually a venous blood sample is obtained in a citrated tube first thing next

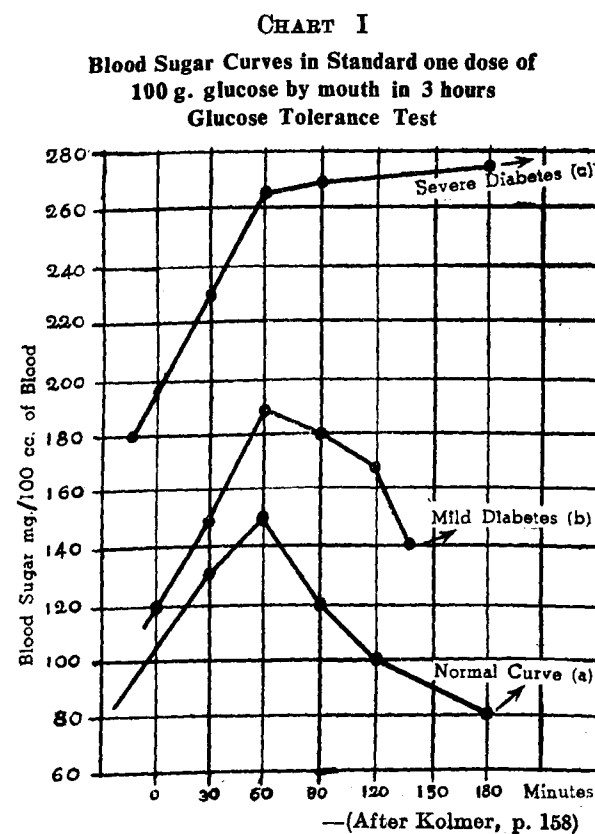
MAJOR J. S. CHOWHAN, M.B., B.S.,
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Late Pharmacologist, Central
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morning, before breakfast. In a normal healthy individual the fasting blood-sugar is on the average from 80 to 110 mg. per 100 cc. of blood. The blood-sugar when taken 1 to 1½ hours after a full mixed meal is about 130 mg.%. The figures above these averages are considered suspicious of diabetes mellitus. Such suspicious cases are required to be further investigated by the glucose-tolerance test.

The glucose tolerance test.—A person is administered glucose 1.75 g./kg. body weight, i.e. (50 to 100 g. for an adult) by mouth, dissolved in 250 to 500 cc. of water,

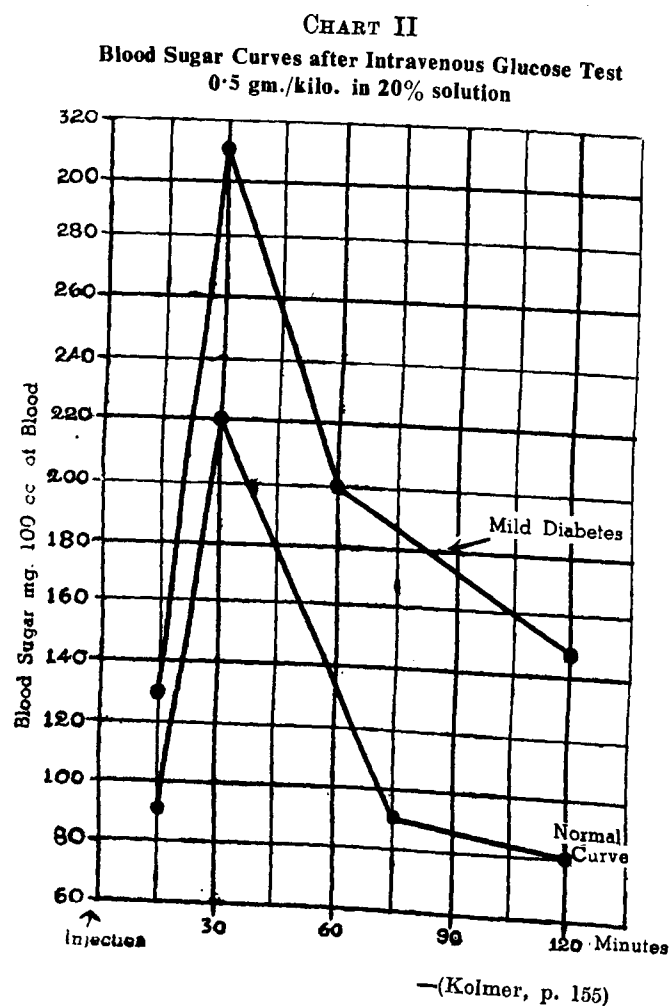


flavoured if necessary with lime juice. The blood is withdrawn

*Specially contributed to the ANTISEPTIC.

[921]

from the vein after $\frac{1}{2}$, 1, 2 and 3 hours respectively and tested for sugar. The concentration of glucose begins to rise within 2 to 3 minutes, depending upon the rate of absorption from the gastro-intestinal tract. It reaches a peak level in 30 minutes (up to about 180 mg. %), and then the concentration begins to fall and reaches a level of 140 to 160 mg.% within an hour and comes back to the fasting level of 100 mg.% in $2\frac{1}{2}$ hours. If the peak rises to 180 to 200 mg.% and above and remains high for



individuals and those who are obese and are of heavy weight or come from diabetic families.

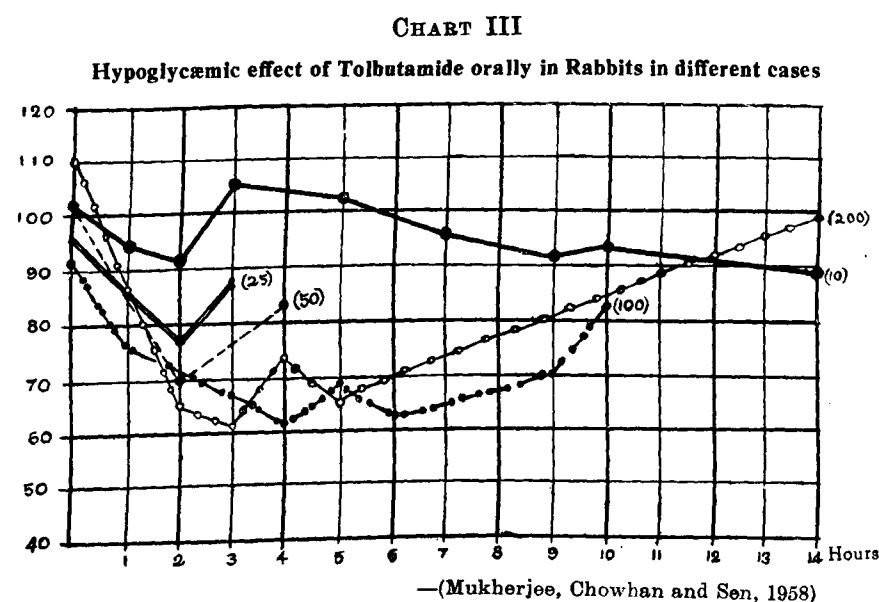
The intravenous glucose-tolerance test.—This test is sometimes carried out in order to eliminate the gastro-intestinal absorption factor. This test has the advantage that only one blood-sugar determination is required, 2 hours after the administration of glucose. A dose of 0.5 g./kg. glucose in 20% solution

1 to $1\frac{1}{2}$ hours and does not return to normal until 3 to 4 hours, the case is considered to be one of frank diabetes (*vide* Chart I, p. 921) which illustrates these cases). A few variations are sometimes observed in the above figures depending upon the rate of gastro-intestinal absorption, the activity of endogenous insulin and the influence of the pituitary and adrenal system.

Cases *a* and *b* shown in the graphs of Chart I are near normal and hence doubtful cases. They require further investigation particularly in the case of all middle-aged

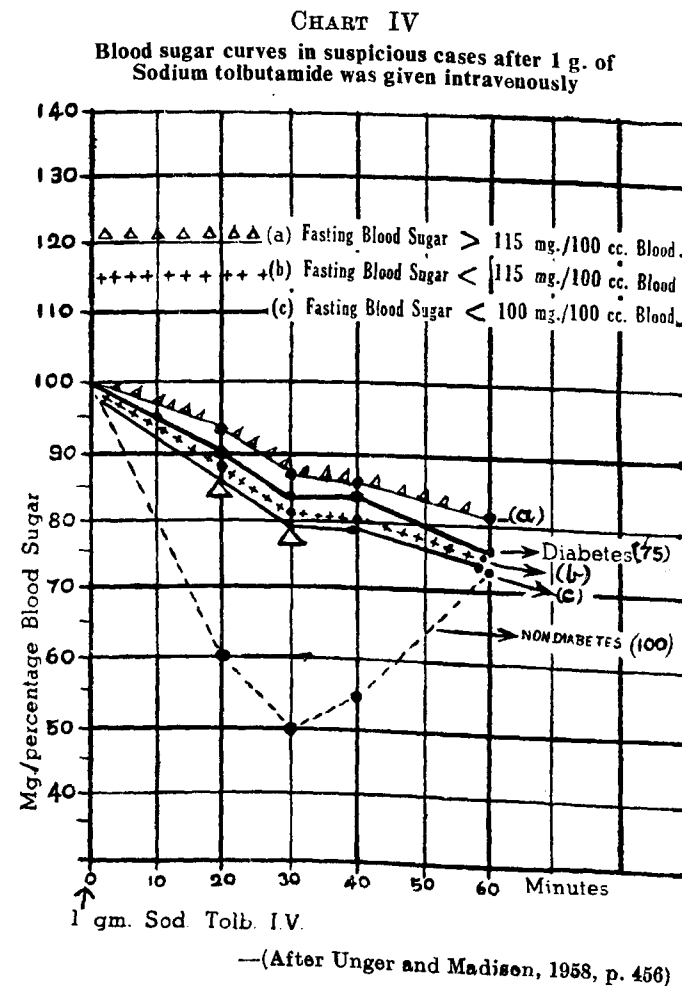
is administered intravenously slowly over a period of 20 to 30 minutes. The maximum glucose level reaches 1 minute after the completion of the injection. In a normal non-diabetic individual the blood-sugar reaches the peak in $\frac{1}{2}$ hour and returns to normal level in $1\frac{1}{2}$ to 2 hours. In a diabetic case it does not return to normal by this time (*vide* Chart II, p. 922).

By the methods discussed above, the immediate and exact diagnosis of border-line and doubtful cases may not be possible. The observations have to be made frequently and for months and years. More delicate tests are required to eliminate such doubtful and incipient cases. These cases develop so slowly and insidiously that one may not be able to detect the progress in time and this may ultimately lead to severe embarrassment in the clinician and a possible disaster to the patient.



Tolbutamide test for mild diabetes cases.—Chowhan and Sen (1957), Mukherjee, Chowhan and Sen (1958) while studying the hypoglycæmic properties of sulphonylurea compounds and particularly that of Tolbutamide in laboratory animals reported that when the latter compound is administered orally or parenterally to adult male rabbits in doses of 10, 25, 50, 100 and 300 mg/kg. it produces a distinct reduction of blood-sugar which reaches the lowest level in 1 to 2 hours (*vide* Chart III, above). The hypoglycæmic effect remains predominant up to 6 hours and persists for 18 to 24 hours. In smaller doses—10, 25 and 50 mg./kg., this drug produces a drop in the blood-sugar from 78 to 60 mg.% within 1 to 2 hours. Recently we further studied in detail the effect of small doses at short intervals of 10, 20, 30 and 40 minutes after an intravenous administration of Tolbutamide. The

pattern of these graphs is quite striking. It will be noted (*vide* Chart V, p. 926) that 20 mg./kg. in rabbits did not produce any marked hypoglycæmia in such short periods. A dose of 50 mg./kg. (equivalent to 3 g. per 60 kilo adult person) produced hypoglycæmic effect which was almost parallel to that of 1 g. per 60 kilo for man. Such response for rabbits, requiring a 3 times bigger dose than for man, may be either due to a greater degree of



tolerance to Tolbutamide in rabbits and other lower types of mammalia or to the fact that in such animals the diet consists chiefly of carbohydrates (vegetables and legumes) and hence they require a larger dose of this drug to reduce the blood-sugar as compared to human beings (Unger and Madison study cases), who eat a mixed diet presumably richer in proteins. Similar studies are being made with Chlorpropamide and the results will be reported later.

Procedure of the test.—A standard 300 g. carbohydrate diet was given for 3 days to a series of persons, and after an overnight fasting, their blood-sugar was tested for the glucose level. Tables I and II, on p. 925 show the blood-sugar concentration in different groups of persons. Group (a) consists of frank diabetes, groups (b) and (c) where the blood-sugar was 115 mg.% and below were classed as suspicious and were further investigated. One g. of Sodium tolbutamide dissolved in 11 cc. of distilled water was injected intravenously slowly in 2 minutes. Specimens of blood

were withdrawn after 10, 20, 30, 40 and 60 minutes, and the blood-sugar was estimated. Chart IV on p. 924 shows the hypoglycæmic graphs in groups b and c and their relationship to definite diabetes and non-diabetes graphs. It will be seen that the graphs of suspicious and borderline cases were very close and ran almost parallel with cases of frank diabetes but were very divergent from non-diabetes cases.

TABLE I
Showing the concentration of blood-sugar in health and in diabetes

Blood-Sugar		Normal range mg. in 100 cc. of blood	Diabetes mg. in 100 cc. blood
In health	After 5 hours' fasting	80 to 110	—
	After a full meal (1½ hours later)	upto 110 upto 130	above 110 above 150
Hyperglycæmia	Slight	—	120 to 140
	Moderate	—	150 to 180
	Severe	—	190 and above
Hypoglycæmia	Slight	60 to 70	—
	Moderate	40 to 50	—
	Severe	30 or less	—
Glucose tolerance test :		½ hr.	2-2½ hrs.
		180 180	200 110 above 110

TABLE II
Showing fasting blood-sugar tested by Unger and Madison on a number of healthy and random cases

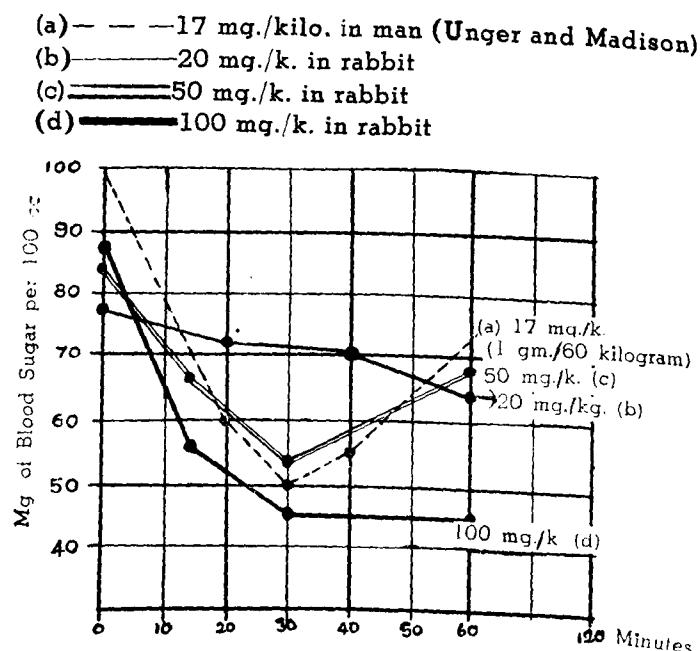
(a) 94% Persons	... Blood-sugar 115 to 180 mg.% (Diabetes)
(b) 45% Persons	... Blood-sugar below 115 mg.% (border line)
(c) 25% Persons	... Blood-sugar below 100 mg.% (suspicious)

In the case of non-diabetics there was a marked fall in the blood-sugar reaching a level of 50 to 60 mg.% in 20 to 30 minutes. While in suspicious and doubtful cases, though they had a fasting blood-sugar very near the normal range, after Tolbutamide administration, they showed a hypoglycæmic curve almost allied to that of diabetes. Chowhan and Sen (1960) referred to this test; but it has been further elaborated in this paper so that the test may be applied more frequently wherever a suspicion of diabetes arises. Unger and Madison (1958) have suggested "a failure of the blood-glucose to fall below 84 mg.% of the pre-test level in 20 minutes after an intravenous injection of one g. of Sodium tolbutamide should be considered as strong evidence of diabetes mellitus." A fall of blood-sugar to 80 mg.% and below of the pre-test value will be strong evidence against diabetes. "At 30 minutes a failure of the blood-sugar to fall below 77 mg.% of the pre-test value constitutes even more specific evidence of

diabetes" (vide mark Δ in Chart IV, p. 924).

CHART V

Effect of Sodium Tolbutamide in small doses intravenously in Man and Rabbits



earnestly desired that this test may be used more freely in disputed life-insurance cases or in those which are being considered for confirmation in permanent Government posts.

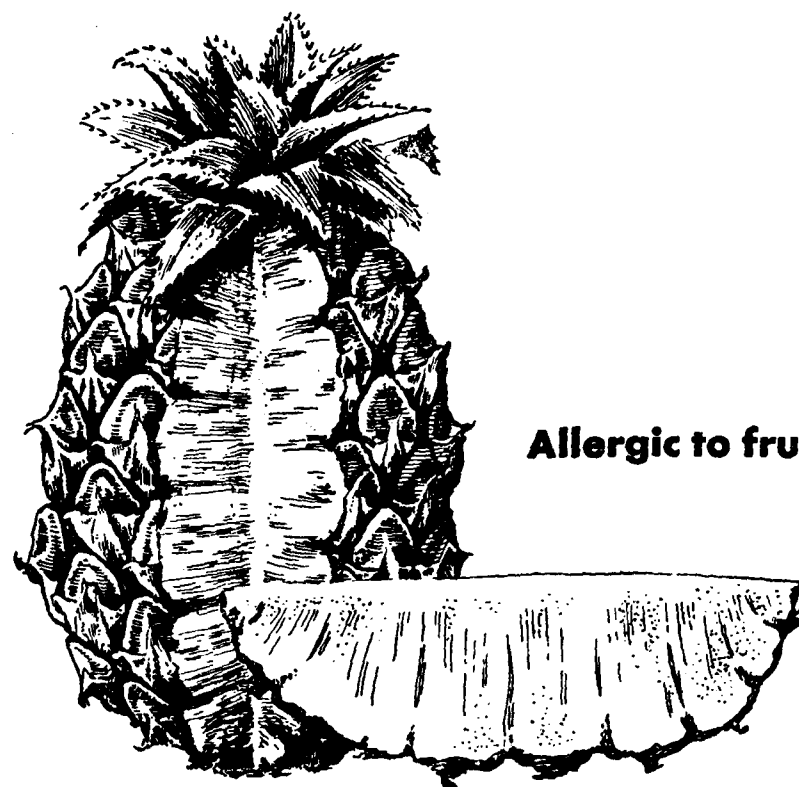
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THE SURGEON'S ROLE

In many cases, particularly when no alternative method of treatment is available, and this applies to all cancers of the alimentary tract, the attempt must be made to eradicate the disease. Operation may seem a desperate chance, but the alternative is no chance at all. The patient is like a man in a burning aeroplane and we are offering him a parachute; to the chance were he the patient. A surgeon would have no hesitation in taking 'If ever I get cancer, I am going to a surgeon with good hands and not too much sense.'—(Sir Heneage Ogilvie, F.R.C.S. in "*No Miracles among Friends*").

This test is simple and requires only a single blood-sugar estimation 20 or 30 minutes after an intravenous injection of Sodium tolbutamide. Care has however, to be taken in using the test on patients suffering from atherosclerosis. This test is deemed to be a valuable addition to the diagnoses of diabetes particularly in mild and doubtful cases. It is



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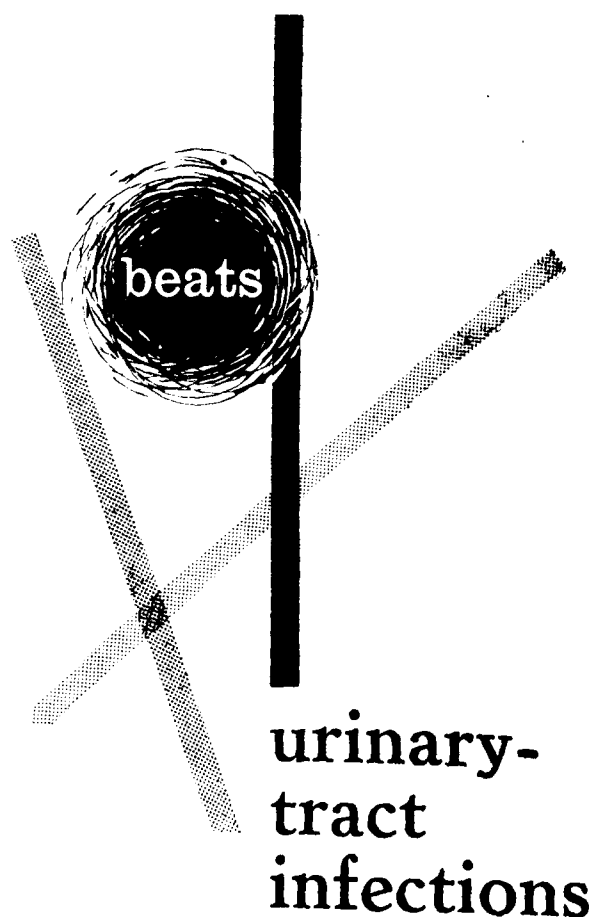
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TREATMENT OF ROUND WORM INFESTATION WITH BUTEA FRONDOSA—AN INDIGENOUS DRUG*

A Report of 17 Cases

M. V. RAMANAN, L.I.M.,
Senior Physician (Siddha),
Central Institute of Research
in Indigenous Medicine, Jamnagar

It is a well known fact that parasites infest the human intestine and produce disease. A good description of round worm infestation and the symptoms produced, is found in "Siddha Medicine," *Para Rasa Sekaram, Vaithya Perunool Kaviyam, Agasthiyar Vaithyam and Bogar Vaithyam* 800, which are treatises in the Tamil language, 3000 years old.

The description given therein tallies very well with our present knowledge in some respects. A detailed knowledge and description of the life history of the parasite is not found there, but an attempt at treatment is given. The results of treatment as described in these ancient texts, *Bogar* 12000, *Yugi Karisal* and *Venba, Agasthiya Pathartha Guna Chinthamani* and *Korakkar Malai Vagadam* are also interesting and instructive.

The workers at the Central Institute here have been engaged for sometime in the evaluation of the older remedies and on the basis of the ancient texts I decided to give a trial to "*Palasa beej*" (seeds of *Butea frondosa*) in cases of "*Kudar Puzhunoi*" or round worm infestation. The results of treatment in 17 cases are presented in this paper.

Material and methods.—The cases were not selected but were from cases as they reported for treatment at the outpatient department of the Institute. The diagnosis was initially made by the Siddha system and only those cases were selected which were confirmed by the finding of ova in the stools. Seventeen cases were thus dealt with. All age-groups were represented from 3 years to 58 and the patients were of both sexes.

TREATMENT:—The method of giving the medicine was as follows:—The patient was kept under observation for 3 days; *Palasa beej* decoction (*Quath*) prepared with one ounce of the powder boiled with 8 ozs. of water down to one oz.), 1 oz. is administered orally, twice daily for three days. The drug is continued for periods of 3 days with one day interval, till a cure is obtained, which is usually in 15 days. After the first three days of treatment the stools were examined daily for adult worms and when no worms were found in the stools they were examined for ova. Treatment was stopped when 6 consecutive stool examinations were negative.

The drug can safely be given up to 30 days; if necessary in instalments of 3 days at a time with an intermission of one day

*Specially contributed to the ANTISEPTIC

[927]

between every 3 days, with no ill-effects. The dose was adjusted according to age. Cases were discharged only after 3 consecutive stool-examinations were negative.

Results.—Seventeen cases in all were treated, and the diagnosis was confirmed by microscopic examination of the stools in all of them.

The cases usually started passing worms at the end of 3 days of treatment. The results are presented in Table I below :

TABLE I
Giving a summary of the results of treatment of round-worm infection

S. No.	Age/Sex	Diagnosis confirmed by microscopic examination	Treatment	Medicine acted on	Days treated	Total amount of drug used	Total worms passed	Results	Remarks
1	4/MC	Kudar puzhu Man puzhu Presence of Ova (<i>Ascaris lumbricoides</i>)	Palasa gr. 20 t.d.s.	3rd day	1	60 gra.	2	+3CT	
2	9/MC	"	"	"	1	60	1	- 6CT	
3	12/M	"	" gr. 40	"	3	360	3	+3CT	
4	22/F	"	" gr. 20	4th	9	540	10	- 6CT	
5	24/M	"	" b.d.	9th	6	240	6	+3CT	
6	6/MC	"	"	3rd	8	480	25	- 6CT	
7	7/FC	"	Quath $\frac{1}{2}$ oz. (b.d.) $\frac{1}{2}$ oz. 1-8	4th	18	36 ozs.	4	- 6CT	
8	3/FC	"	"	3rd	5	5	3	- 6CT	
9	8/FC	"	"	"	5	14	14	- 6CT	
10	22/F	"	Palasa gr. 30 t.d.s.	"	8	1 $\frac{1}{2}$	10	- 6CT	
11	9/FC	"	Quath 1 oz. (1:8) b.d.	"	15	30	4	- 6CT	
12	5/MC	"	"	"	9	18	3	+3CT	
13	4/MC	"	"	"	17	34	45	- 6CT	
14	4/MC	"	(1:8) dose b.d.	"	20	40	357	- 6CT	
15	33/F	"	$\frac{1}{2}$ oz. b.d.	"	17	34	4	- 6CT	
16	22/M	"	$\frac{1}{2}$ oz. "	"	12	12	1	- 6CT	
17	58/M	Tapeworm	1 $\frac{1}{2}$ oz. b.d.	4th	4	8	1	- 6CT	Tapeworm 12" long passed

CT : Consecutive tests —Negative for ova. + Stool examination. inc to ova of ascaris

It will be seen from the above results that all cases became negative to ova of ascaris when followed over a 2-month-period. Six consecutive stool examinations were negative before the patient was discharged.

In the first year the treatment was started with the dry powder given with water and the total dose varied from 60 gr. to 1400 gr. This variation in dosage is partly explainable by the age and partly by the experimental nature of the project in the first year. When given as powder most patients experienced nausea and vomiting. It was therefore, decided in 1958 to give the medicine in the form of a decoction (*quath*). The dose varied considerably from 8 $\frac{1}{2}$ oz. to a maximum of 58 oz. The dose was adjusted according to age.

Most of the cases had some nausea on the first day, but gradually became used to the drug and did not have much trouble later on.

The duration of treatment varied from two to 29 days. Only a few cases needed prolonged treatment, and in the majority of cases 15 days were enough.

It is remarkable, that cases which once became negative remained so for a long time. It was possible to undertake a follow-up for 2 months except in 4 cases and all remained cured.

This drug is an effective anthelmintic, which is very cheap and produces hardly any side-effects.

Proposals are under way to standardize the treatment and dosage and if possible to study the pharmacology of it, and isolate the active principle, so as to enable the drug to be made and marketed on a commercial scale.

The 17 cases were admitted into the hospital for controlled treatment and careful observations of the results, side-effects and complications if any. It is now clear that it can be made a routine and safe out-patient treatment.

Summary.—The results of treatment of 17 cases of ascariasis with the powdered *Butea frondosa* have been presented in this paper. Except 4, all cases were cured as judged by the absence of ova in six consecutive stool examinations. No untoward side-effects were noted. We have in this drug a safe, effective and cheap drug for the treatment of round-worm infestation.

Pharmacological studies with a view to standardization of the drug and the mode of administration are being made; and a further series of a larger number of cases will be studied.

Acknowledgement.—I would like to thank Dr. Raja Purkar, Prof. of Pharmacology, M. P. Shah Medical College for encouragement and advice, Dr. Trivedi, M.B., B.S. (Pathologist of C.I.B.I.S.M.), for help with laboratory investigation, Offg. Director Sri R. R. Pathak, C.I.B.I.S.M., for his kind help and to Dr. P. R. Bhatt, M.D. (C.I.B.I.S.M.).

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PROTEIN-BINDING SULPHONAMIDES

Recently there has been much interest in new sulphonamides that produce a persistently high blood-level with a single daily dose and that give blood concentrations comparable with those produced by the established regimen of six hourly doses of the standard sulphonamides. Though *in vitro* these new drugs had similar antibacterial activity to sulphadiazine, some of the results of clinical trials were disappointing. In the hope of explaining these results, Newbould and Kilpatrick (*Lancet*, 1: 887, 1960) examined the protein-binding properties of three of the long-acting sulphonamides—sulphaphenylpyrazole, sulphamethoxypyridazine, and sulphachloropyridazine—and the effect of any such binding on their persistence in the blood and their penetration into the cerebrospinal fluid. The degree of attachment of sulphonamide to protein was measured by dialysing human plasma, to which sulphonamide had been added, against phosphate buffers.

The authors found that the new long-acting sulphonamides are more extensively bound to plasma protein than are the older sulphonamides, such as sulphadiazine and sulphamethazine. This extensive protein-binding leads to lower diffusible concentrations in the plasma and therefore to lower concentrations in compartments such as the spinal fluid. The antibacterial activity of a sulphonamide depends on the diffusible concentration of active drug, which has no such activity when it is protein-bound. Acetylation rates also depend on the concentration of diffusible drug, and thus sulphonamides that are highly protein-bound are only slowly acetylated. On the other hand, the rate of renal excretion does not depend solely on protein-binding, since highly bound compounds such as sulphachloropyridazine are rapidly eliminated in the urine.

Higher total plasma concentrations are required with these newer sulphonamides than with older ones to produce similar diffusible drug concentrations and a similar therapeutic effect. The protein-binding could explain some of the disappointing results of clinical trials with the new sulphonamides, which penetrate poorly into the spinal fluid. The generally recommended doses of the new sulphonamides were chosen by the manufacturers to give total plasma concentrations similar to those considered adequate for therapy with sulphadiazine and sulphamethazine. If such doses are used, lower tissue concentrations will result and the antibacterial activity will be less. The results of Newbould and Kilpatrick suggest that the therapeutic value of the new sulphonamides does not surpass that of the older compounds. Any increase in dose to raise the concentration of unbound drug in the plasma may increase the possibility of toxic effects.—(via *J.A.M.A.*, 18-6-1960).

POTASSIUM THERAPY*

POTASSIUM THERAPY:—Potassium is one of the inorganic constituents widely present in fruits, vegetables, milk etc. without which our diet is not complete.

H. GHOSH, M.B., D.T.M.,
Calcutta-26

Although widely distributed in nature, it is difficult to constitute a diet with an excess of potassium in it; but potassium salt can be easily obtained commercially. The human body contains about twice as much potassium as sodium. Potassium is found mostly inside the cells and in tissue fluids. It is now a well understood fact that the correction of potassium depletion is a valuable and often life-saving therapeutic procedure, which is therefore, applicable to a patient with demonstrable need for this ion.

Potassium deprivation occurs when there is an excessive loss of body-fluid and also a marked depletion by loss in urine which occurs after any surgical intervention.

The clinical diagnosis in potassium depletion is a difficult matter and will largely depend on an appreciation of the conditions that can bring it about and in the symptoms that they fail to (*sic*) conventional salt or fluid therapy.

Dehydration from any cause with or without acid-base disturbances is fundamentally a state of depletion of Sodium chloride and water with accompanying deficits in potassium. In a dehydrated patient it is always wise to suspect and be prepared to correct potassium depletion. But it is not advisable to do so in a dehydrated person with impaired renal function with oliguria or where the flow of urine is not satisfactory.

Dehydration calls for two phases of therapy *viz.*, (1) **IMMEDIATE TREATMENT:—**Rapid recoupment of deficits of water, sodium and chloride with the immediate object of re-establishing an adequate circulating blood-volume and of restoring renal function. This phase should commence at once, and will last for a few hours. The chief clinical signs of its successful completion is indicated by a satisfactory flow of urine. (2) **SUBSEQUENT TREATMENT:—**A simultaneous maintenance of normal requirements, replacement of continuous abnormal losses and gradual repair of the potassium deficit by providing appropriate amounts of sodium chloride, water, and potassium together with sufficient carbohydrates to meet most of the body's caloric requirement.

This phase is undertaken, when the urine flow has become quite satisfactory. It lasts until an adequate oral intake is resumed.

* Specially contributed to the *ANTISEPTIC*.

Mode of action.—Potassium salts act by increasing the electrolytic concentration of blood. The osmotic balance between the fluid and the surrounding tissue is disturbed by attracting water in the blood vessel, leading to a tendency to produce a hæmodynamic stage. This tendency is towards an increase in the volume of blood and a greater activity on the part of various glandular secretions. Not only is the secretion of urine greater but there is an increase in the bronchial, sweat and other glandular secretions. Thus potassium therapy corrects the electrolytic and water-distribution of the muscle, removes oedema and effects clinical improvement.

Advantages of potassium therapy.—Like all other salts, potassium is also rapidly absorbed from the small intestine. Its kidney-threshold being low it is more rapidly excreted than sodium, which has got a tendency for retention. Potassium salts are more efficient diuretics than sodium salts. The oral administration of a moderate quantity of potassium practically acts through its osmotic effect, diuresis, a slight change in metabolism and so forth. The fate of potassium is controlled by the adrenal cortex, in the absence of which excretion falls, and so potassium is retained. Cortical hormones increase its excretion.

Potassium after an initial period of stimulation, depresses the muscle and nerves. Potassium improves conduction from the motor nerves to voluntary muscles and so antagonizes curare. When the plasma potassium falls below half its normal (normal 18 mg./100 ml.) impulses fail to pass the synapse and the muscle is paralysed. The action of potassium on the heart is however, only a depressant one.

The excretion of potassium is so rapid that none of these effects are seen when potassium salts are administered to a healthy individual.

The lethal dose of potassium chloride is high (500–1000 mg./kg. by *i.p.* injection in most small animals). Potassium poisoning occurs only when its excretion from the system is delayed.

Besides its pharmacological effect, potassium increases various secretion through what is known as salt-action, by increasing the electrolytic concentration of blood.

In the initial stage of acidosis, fixed bases, both sodium from extra-cellular fluid and potassium from intracellular fluid, are utilized for neutralization of the excess acid to be excreted by the kidney. If the kidneys are healthy, their base-conserving mechanism comes into play within a few days.

The question is how much to give and by what route? There is no clinical or routine laboratory method of estimation of the degree of potassium depletion. The estimation of serum or plasma or erythrocyte potassium by the photometric method can

seldom be made available. The exact minimal requirements of various electrolytes for men are not fully known. The supposed average intake of different salts varies with different workers. The daily intake of 4 to 6 g. will meet the body's need of potassium. Controlled experiments to assess the intake and excretion with different body electrolytes have shown that anything up to 6 g. of potassium can safely be administered without risk.

In mild cases however, where there is no continuous drainage, 3 g. daily will probably suffice to meet the deficit in 2 to 3 days.

The potassium ion, although necessary for normal functioning and constitutes a building stone in the cell structure, is highly toxic when present in extra-cellular fluid in a concentration of only $\frac{1}{8}$ to $\frac{1}{10}$ th, of that found in the cell.

Therapeutic uses.—Potassium is valuable chiefly as a diuretic, and its salts are more effective in this respect than the sodium salts. As citrates are oxidized in the body into carbonates, the salts tend to correct any systemic hyperacidity.

Potassium gives the best result in cardiac oedema, although it may be used in oedemas due to other causes. It is often more effective when combined with a diet low in sodium chloride, potassium chloride rather than sodium chloride being used to flavour the food.

Salt depletion states, especially when due to factors, disturbing the acid-base balance of extracellular fluid, bring about a potassium deficit which may be severe enough to cause a lowering of the potassium concentration in extra-cellular fluid.

“The potassium deficit in the body resulting in the shifts in potassium and sodium between extra-cellular and intra-cellular fluids, which occurs in salt depletion, acidosis and alkalosis, will be aggravated, where these states are caused by a loss of gastric and intestinal secretions (vomiting, severe diarrhoea, or continuous suction drainage)—since these secretions contain potassium in higher concentrations than the extra-cellular fluids. Loss of intra-cellular potassium also occurs where the body fluids of a salt-depleted patient are restored and maintained by continuous intravenous infusions of solutions containing only sodium chloride.”

It is recognized that most clinical disturbances of hydration and distortion of the ionic pattern of extra-cellular fluid involve changes in the cellular-fluid-composition as well. If a solution containing potassium is infused into a patient with dehydration and oliguria, it is possible to produce *potassium intoxication*, the clinical signs of which are apathy, bradycardia and circulatory collapse etc.

The aim of parenteral therapy is the orderly restoration of body-fluids to their normal composition. The procedure adopted should be practical to the physician and safe for the patient. To avoid danger of potassium intoxication in this therapy one should:—(1) be fairly certain that the patient has a deficit of cellular potassium as a result of the type, severity and duration of illness, such as diarrhoeal disease, vomiting and post-operative conditions, diabetic acidosis etc.; (2) give the potassium will enter the cell or get excreted in the urine; (3) not use potassium-containing solutions if adrenal insufficiency or suspected. The subcutaneous route allows one to control the rate of administration more readily than a continuous I.V. is to be preferred. Hence, of the two parenteral routes, hyperdermoclysis

Details regarding the composition, strength of the solution and about its administration alone and in combination with sodium, chloride or lactate, can be had from any text book on medicine.

Because of the incidental hazards, great caution must be observed particularly in regard to the selection of the proper type of electrolytes of suitable composition and quantity, and the rate and route of administration; *the oral route when circumstances permit must be the route of choice.*

In the treatment of cholera where there is diarrhoea with dehydration, no attempt should be made to replace the potassium loss until the kidneys have started to function properly.

In familial periodic paralysis, a rare disease having no specific cure, relief may be obtained from oral potassium therapy, the action being due to the potassium ion exciting neural and muscular irritability.

Quite recently Durlalach of France found the potassium salt to be very useful in the treatment of electrolytic imbalance, which in his opinion is the factor underlying *premenstrual tension*. The treatment must start on the day before the syndrome usually appears and be continued until the onset of menstruation. He claims to have had excellent or good results in 37, of the 42 patients to whom he gave this; in cases in which the results were not satisfactory, the addition of Meproamate was of value.

Potassium salts are frequently advocated for use as expectorants in the early stages of acute bronchitis or tracheitis; by increasing the secretion of the mucus-glands it indirectly exerts a sedative action on the inflamed mucous membranes. It is a valuable sudorific in the early stages of the milder infections. Potassium is considered to be specifically useful in cases of

cystitis when the urine is highly acid. During sulpha-therapy it prevents crystalluria. In long term treatment with cortisone, leading to a retention of salt and water and to a loss of potassium, the administration of potassium is definitely indicated.

Potassium salts are often effective in controlling extrasystoles, specially those due to digitalis toxicity. The dose is 2 to 4 g. three to 4 times a day by the oral route.

As all normal operative interventions are associated with a loss of potassium, both pre-operative and post-operative potassium substitution therapy is often an absolute necessity.

A potassium level less than 13 mg. per 100 cc. may cause general weakness to flaccid paralysis of the extremities with abolition of tendon reflexes and has often prevented an operation from being successful. It is therefore, advisable to provide for potassium substitution before, during and after surgical intervention. Substitution by mouth is the most favourite method. Fruits, vegetables, meat with other energizing food—like vitamin supplements, or even *i.v. inferior (sic)* and dextrose etc. cannot however in some cases be effective substitutes for pharmaceutical potassium preparations.

Besides dehydration, acidosis and the other conditions already mentioned, reference may be made to the use of potassium therapy in other clinical conditions too, like cataplexy, a disease with accompanying symptoms and episodes of muscular weakness as a rule with laughter, or getting startled. Under ordinary circumstances, it is not necessary to treat the symptoms of cataplexy, since they are not usually severe or frequent enough to warrant special treatment. There are however, certain patients with cataplexy who get so disabled that they must be given potassium salts by mouth, after meals under doctor's advice.

The importance of hypopotassæmia in diabetic acidosis following therapy with insulin, saline and glucose, has been emphasized. Before treatment the serum potassium level is usually normal or may even be elevated despite the loss of potassium caused by the acidosis.

With the institution of insulin therapy however, potassium passes from the extra-cellular to the intra-cellular fluids and cases have been reported where the serum potassium fell down to an abnormally low level.

Thanks to the hæmostatic mechanism of the human body, it requires a great deficiency of potassium in the body before the potassium concentration of the extra-cellular fluid is reduced and it is only when this occurs that clinical manifestations attributable to potassium deficiency are manifest.

Recently Wigley reported several cases of anorexia nervosa with hypokalaemia. Conventional treatment should correct the deficit but oral or *i.v.* potassium was found necessary.

Potassium intoxication.—If a solution containing potassium is infused into a patient with dehydration and oliguria, potassium intoxication may be induced, the clinical signs of which are apathy, bradycardia, circulatory collapse with a rise in the toxic level of plasma potassium. Such poisoning is treated by the cautious *i.v.* administration of 5 to 20 cc. of 10% Calcium gluconate solution followed by the rapid *i.v.* infusion of 20 cc. per lb. of body-weight of 0.45% solution of NaCl in 2.5% dextrose.

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ROUTINE IMMUNIZATION WITH ORALLY ADMINISTERED ATTENUATED POLIOVIRUS—A STUDY OF 850 CHILDREN

Recent epidemics of poliomyelitis in the United States have centred in the poorer sections of cities; the disease has principally affected children less than 5 years old. An increase in the incidence of poliomyelitis in Philadelphia, in 1958, when one-half the cases occurred in young children in the densely populated heart of the city, prompted the Department of Public Health to explore a new method of immunization. A practical test of several strains of orally given poliovirus vaccine among children in an open community was designed as an important addition to the investigations of the action, effectiveness, and safety of living attenuated poliovirus vaccines that have been conducted in the United States and abroad since 1949.

Studies with living poliovirus vaccines have been conducted within institutions and families under ideal conditions. The present study explored the feasibility of early immunization of normal children living in a low-income area of an American city. Most of the 850 children 1½ months to 6 years old entering the study were susceptible to poliomyelitis. One, two, or three types of vaccine given orally at monthly intervals yielded significant antibody responses in 93 to 100% of children who had not yet lost maternal antibodies, and in 84 to 100% of children who had antibodies. Although this was not an evaluation of vaccine safety, community surveillance was maintained; no case of poliomyelitis in Philadelphia occurred in a person vaccinated by this method or in his household. The vaccines were efficacious, according to serologic evidence, in conferring immunity to poliomyelitis.—(J.A.M.A., 27-8-1960).

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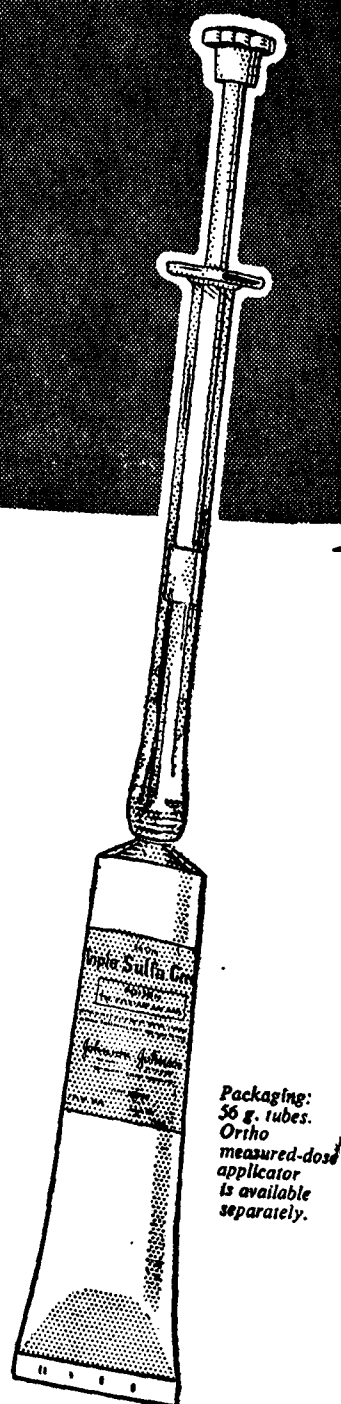
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Editorials

NATIONAL WATER SUPPLY AND SANITATION PROGRAMMES

(Symposium on Public Health Engineering: Call for Research to reduce Cost)

THE symposium organized under the joint auspices of the Madras State Government and the Central Public Health Engineering Research Institute at Nagpur, was inaugurated on 14th September 1960 at Madras by Sri M. A. MANICKAVELU, the State Health Minister, Srimathi LOURDHAMMAL SIMON, Minister for Local Administration, presiding.

The Director of the Research Institute referred to the lack of protected water supply and drainage in a very large area of the country and to the magnitude of the problem, especially from the financial point of view, and said the engineers should find ways to reduce the cost of the various schemes for which research was needed.

Sri M. A. MANICKAVELU very properly mentioned the fact that through these long years they had only touched the fringe of the problem of protected water supply and adequate drainage facilities to the people. The importance of environmental sanitation in relation to the relative freedom from diseases, should rank first in people's minds and in Governmental policies and programmes for urban and rural development. Until this is accomplished we cannot expect to win the battle against disease and water-borne infections which bring hundreds of thousands of people into the hospitals every year. At least one reason for the tendency of the educated classes to crowd into the big cities (resulting in the smaller towns being denied the benefit of medical and other experts) is the lack of safe water and underground drainage in the mofussil. Fortunately, in Madras State,

[937]

significant progress has been made. Out of 59 schemes in the Second Plan, 32 are nearing completion and the remaining number will be finalized in the first part of the Third Plan, when another 60 new schemes will also be taken up. It is expected that all the Municipalities in this State, as well as 41 major panchayats, will have protected water. But this does not include drainage, which progresses much more slowly because of the greater expense involved.

We agree with Srimathi LOURDAMMAL SIMON that it is the duty of the sanitary and other public health experts in the engineering and preventive medicine fields to conduct researches on the most suitable and at the same time most economic methods to provide amenities to the people in this regard. She welcomed suitable suggestions to the Committee of which she is the Chairman, for providing cheaper water treatment plants to suit Indian conditions.

The problem of sewage disposal is even more difficult and as Sri MANICKAVELU pointed out, it has not yet been satisfactorily solved even in the metropolis of the State. Here in Madras we have plans for more sewage farms and other big towns in the State have similar projects, but a good deal of sewage is now being let into the ocean, which is not a very hygienic solution. There is also a growing problem of the disposal of industrial effluents which is likely to grow worse as more and more industries come into being. It is important that as the factories are planned, the problem of waste-disposal should also be taken into account so that it will not cause trouble later.

We believe that the Madras Government's Expert Committee on Water and Sewage Purification have for several years past conducted and are still engaged in numerous experiments field-tests and pilot-plant-trials at various places in relation to the purification of water for potable purposes and the proper treatment for the different types of industrial wastes to render them innocuous before being let into water-courses or the soil. We would like to suggest that the results of this Committee's extensive researches are properly utilized in the planning and execution of future treatment-plants.

With regard to the provision of reasonably safe water to rural areas, the Madras State's scheme, we are told, is designed to provide water for all rural areas with a population of more than 10,000 persons, from bore-wells with pumps attached, closed wells with overhead tanks, connection with municipal mains and from ordinary draw wells. We learn that the target for the Second Plan, of 8,500 wells and 340 composite schemes is likely to be fully achieved. This will leave three thousand

villages and two thousand hamlets still to be provided for, which are expected to be dealt with in the Third Plan.

In addition, there is the National Water Supply and Sanitation Scheme from which funds will be available to the tune of Rs. 3 crores in the Third Plan. This is intended to eradicate water-borne diseases like cholera and typhoid in the larger villages. This programme is now in execution in 656 villages at a cost of Rs. 120 lakhs. A great deal of public health propaganda will have to be carried on in the villages before proper drainage and sanitation gain the support of the people in the rural districts.

The Union Health Minister has estimated the total cost of providing a sound system of protected water supply for the entire country at Rs. 1,500 crores. Since this is but one aspect of public health expenditure in a backward country, with other problems like an adequate medical service, prevention and cure of other types of communicable diseases and so on, clamouring for financial and physical allocations, the outlook for getting to grips with such water-borne epidemics as cholera in the foreseeable future may appear dismal indeed. But the picture is made even more dismal by cutting down the allocations under this head at the first call to prune the Ministry's estimates. Experts have already indicated that it is no use expanding various health schemes unless they are preceded by a safe water supply. Cholera is still considered "a national epidemic of India and Pakistan." If we are to get rid of this unenviable reputation abroad and save the heavy loss of life from year to year, we have obviously to step up the measures, both preventive and curative, in this regard. Assuming that a protected water supply all over the country is at least a decade away, adequate steps must be taken to educate the people, primarily the villagers, to protect themselves in times of water-borne and other such epidemics, by boiling the water they drink, by not eating fly-infested articles of food sold on the streets and what is more, by preventing the sale of such foods on the roads.

THE ROLE OF NURSES AND MATERNITY ASSISTANTS

(Greater Facilities for Training)

INAUGURATING the tenth annual conference of the Madras State Branch of the Trained Nurses' Association of India at Madurai on the 17th September last, Srimathi S. AMBUJAMMAL, Chairman of the Madras State Social Welfare Board, made a fervent appeal to the young educated women in the country to take to the nursing profession. Besides offering a field for employment and

an opening for our young educated women, it affords a most valuable and glorious opportunity to render service to humanity by alleviating the sufferings and ministering to the comforts of the sick. In her very lucid address Srimathi AMBUJAMMAL stated that about 200 midwives were serving in the rural areas in the State under the auspices of the State Social Welfare Board and their services were well received by the rural population. The rural medical workers should be trained as "auxiliary midwives," so that they could also give general medical aid in times of emergency.

Service in the rural areas should be made obligatory for nurses and midwives, and with the increase in the activities of the various rural development centres, this should not, in our opinion, be a difficult matter. The State Government has also been considering the question of making it compulsory for all medical graduates, on completion of their collegiate studies, to serve in the rural areas for about 2 to 3 years.

It is common knowledge that there is a paucity for trained nurses and midwives in the country and both the Centre and States Governments have been doing their utmost to increase the number of training institutions so as to provide for a larger number being given the requisite general and specialized training in nursing. Thus, a proposal to extend the integrated course of training in nursing to the Government Kasturba Hospital for Women and Children, Madras, is under the consideration of the Madras Government.

A public health nursing course has been integrated with the basic course in nursing with the aid of the World Health Organization and the Government of India and it is already in operation in the three training centres of the Government General Hospital, Madras, the Stanley Hospital, Madras, and the Erskine Hospital, Madurai. These are among the measures undertaken by the State Government to provide better facilities for training and to increase the annual output of nurses.

A two-year-course in physiotherapy has been introduced in the Government General Hospital, Madras, where three staff nurses and three private candidates are stated to be undergoing the course at present. We are glad to know that several members of the nursing staff have also been deputed for higher training in the College of Nursing, New Delhi, the All-India Institute of Hygiene at Calcutta.

Kumari A. C. CHAKRAPANI of the Madras General Hospital, who presided over the Madurai Conference, felt that the unsatisfactory state of health of the rural population was a real challenge to the nursing profession and exhorted the nurses, present and prospective, to rise up to the occasion. She pleaded for the provision of essential amenities which alone will attract

trained nurses to go and settle in rural areas. A 48-hour-week is also necessary if the nurses are to maintain their efficiency, without the risk of losing health, vigour and enthusiasm for sustained work.

Among the many and varied proposals and schemes which are being implemented by the Madras State Government, we note with pleasure that in order to make available an adequate number of maternity assistants for manning the large number of maternity and child welfare centres being opened, the number in the existing training centres has recently been increased by 57, bringing the total number under training at present to 628. Under the Government of India Scheme, an improved course of training—auxiliary nurse-midwives—extending to two years has been introduced in the Government General Hospital, Madras, the Women and Children Hospital, Egmore, the Kasturba Hospital for Women and Children, Madras, the Erskine Hospital, Madurai, and the Government Headquarters Hospital at Tanjore. We also learn that there is a proposal to start this training in another centre, probably, the Stanley Hospital, Madras. It is expected that during 1960-'61, the total number of auxiliary nurse-midwives in training will be about 180, spread over six centres. The prospects, thus appear to be bright and the outlook quite promising, and let us hope that the Third Five-Year Plan period will see the fruition of most of the schemes in this direction.

MEDICAL AID THROUGH CO-OPERATIVE ENTERPRISE

(A Laudable Venture)

THE Public Health and Welfare Society in West Mambalam, a suburb of Madras City, is a practical example of what co-operative enterprise can achieve independent of State-aid, in the matter of relieving distress and suffering in ailing humanity. This society has been running a Medical and Maternity Centre for over 7 years now and on the 30th September 1960, started a clinical laboratory also to serve the needs of the centres. Sri Dr. C. P. RAMASWAMI AIYAR commended the idea of private institutions catering to the needs of the community relying more on themselves and less on the State.

Sri Dr. U. KRISHNA RAU, the Speaker of the Madras Legislative Assembly presided over this function.

It was gathered from the Secretary's report which recounted the activities of the centre, that the services of the doctors and other personnel were all honorary. So far about 1,70,000 patients had been treated and on the maternity side the Centre had

attended to the birth of 131 babies. An Eye Department and a small Operation Theatre had become an urgent need. Two persons had donated, each Rs. 5,000. The Society expected to collect necessary funds from the residents who mostly belonged to the low income group and had helped the institution in the past with donations ranging from rupee one to Rs. 50.

Dr. KRISHNA RAO congratulated the Society on its very laudable venture showing to the world what co-operative endeavour could do, without always looking up to Government for help. Expressing the hope that the Society would continue to receive help from the residents once they were convinced of the proper use of such help, he stressed the need of those in charge of the institution setting their foot firmly on the tendency on the part of patients to dictate to the doctor what medicine should be administered to them, and also on the indiscriminate use of antibiotics like penicillin, which was not in the best interests of the patients themselves, apart from the cost involved. More than medicines, it was kind words and courtesy that helped the cure of many diseases.

Declaring the laboratory open Dr. RAMASWAMI AIYAR said, "in these days when they heard of planning in every department of life, it appears to me that at the bottom of every type of activity what is needed is to keep the houses and streets and the persons in the community clean and free from avoidable infection and disease." Seeing the dirt and squalor around, he felt that the inhabitants of every ward in the City should insist on cleaning the streets themselves and claiming damages from the Corporation, such damages to be paid not to them, but to a public fund. That would produce some good effect. This may sound queer to us here in India, but in Western countries, local authorities in charge of the sanitation and other civic affairs of a town, are liable to be and are sued by the public for acts of omission, neglect or misfeasance.

We agree with Dr. RAMASWAMI AIYAR that the doctor's work should be supplemental and ancillary to that of the Public Health Expert. The preventive side ought always to come first, and then only the curative. The need for public health measures in modern times has arisen on account of extensive urbanization and industrialization and "also because the people have lost of the mooring of their villages in the past where every one helped to keep the surroundings clean."

More than hospitals and medicines there is need for nutritional aid, as half the cases which come to hospitals are due to malnutrition, or misdirected nutrition, either of children or the grown-ups. The sense of self-help which animated the society and made it seek outside help only for items of capital expenditure is indeed very praiseworthy.

In this context, we would like to commend the splendid work done by the medical unit of the Rural Welfare Association of Madras in the neighbouring villages. The unit serves the needs of a dozen villages near Korattur and on an average now more than 150 patients are attended to each day. In an area where practically no proper medical facilities are available within a radius of five miles, the unit has so far treated 35,000 patients. Injections have been administered to more than 5,000 sick. About 3,000 persons have been supplied with costly drugs for speedy convalescence, apart from regular routine therapy. About 800 have been recommended for hospitalization. Many of these latter have been assisted to get admission to city hospitals.

This association gets as aid from the Social Welfare Board, an amount equivalent to that raised by the association's own efforts. There are still a number of other similar philanthropic institutions in this State that are doing unostentatious and silent work in the cause of medical relief.

Need we say that if such voluntary enthusiastic effort is forthcoming in greater measure the problem of rural medical relief in India, will become less difficult of solution.

TREATMENT OF ACUTE CHOLECYSTITIS

Acute cholecystitis is associated with stones in 85 to 90 per cent of cases. Non-calculus acute cholecystitis is primarily bacterial or chemical in origin; acute cholecystitis with stones usually is primarily obstructive. The danger from acute cholecystitis is gangrene and perforation; this occurs in 10 to 15 per cent of cases. The incidence of acute cholecystitis rises sharply with age. In our series the incidence of acute cholecystitis under the age of fifty is 18 per cent, from fifty to sixty-four 20 per cent, and over the age of sixty-five 30 per cent. It is not possible to predict the course of acute cholecystitis and to determine whether an attack will subside or continue until perforation. Chemotherapy has not influenced the course of acute obstructive cholecystitis, for in this disease, which is primarily nonbacterial, the avenues of entrance for the antimicrobial drugs, both the cystic artery and duct, are closed.

Mortality in the past has been high for both surgically and conservatively treated cases. Those patients whose outcome is fatal usually have the advanced form of the disease. Surgical mortality has been high because in the majority of instances surgery has been performed late and heroic measures therefore, had to be undertaken in an effort to save the patient's life. Experience in hospitals in which early operation for acute cholecystitis is practised has established surgery as the method of choice. The mortality in 877 cases of acute cholecystitis in our hospital, where early operation is advocated and practised, was 2.5 per cent over a twenty-five-year period; cholecystectomy alone was carried out on 698 of these patients, with a mortality of only 1.2 per cent.—(N. Y. S. J. M. 15-4-1960).

A CLINICAL STUDY OF THYROID STORM

Waldstein *et al* of Chicago review the clinical manifestations of 21 episodes of thyroid storm observed at the Cook County Hospital from 1955 to 1958, and report the effectiveness of reserpine and steroids in reducing mortality.

Thyroid storm is a "life-endangering augmentation of the symptoms of thyrotoxicosis." There is general agreement that in addition to the exaggerated manifestations of hyperthyroidism, fever, marked tachycardia and signs of central nervous system, cardiovascular, hepatic and gastrointestinal dysfunction are prominent.

Twenty-one episodes of thyroid storm were observed in 20 hyperthyroid patients from 1955 to 1958. Fourteen of 20 "medical storms" were non-fatal, as was one post-thyroidectomy storm. The incidence of storms in all patients hospitalized for hyperthyroidism was 7%. The distribution of patients according to sex and age was comparable to that of hyperthyroidism without storm.

Prestorm thyrotoxicosis was in general severe, and of less than one year's duration. Six patients were under treatment but still hyperthyroid when storm developed. In three-fourths of the episodes, the onset of the storm was abrupt. Precipitating factors included infection, surgery remote from the thyroid gland, thyroidectomy, excessive palpation of the thyroid, pulmonary embolism, fear, and reaction to insulin. Important among contributing factors was propylthiouracil withdrawal. No precipitating factor was apparent in nine episodes. Storm was recognized as a severe exaggeration of all manifestations of hyperthyroidism associated with fever greater than 100°F. (in 2 episodes, greater than 103°F., and marked tachycardia in 16 episodes, greater than 140/minute). Mental disturbances, congestive heart failure, jaundice and diarrhoea were common. Both multinodular and diffuse goitres of varying size were found.

Symptomatic therapy included maintenance of hydration, control of hyperpyrexia, and relief of anoxia. Specific therapy included intravenous or oral iodide, propylthiouracil, intramuscular reserpine and parenteral ACTH or hydrocortisone. Because of the possibility of adrenal insufficiency, hydrocortisone seems preferable to ACTH. The survivors usually responded to therapy promptly and recovered in an average of three days. In the fatalities, storm lasted for an average of seven days.

This study emphasizes the need for early recognition and prompt control of hyperthyroidism to prevent storm. Prior to the attainment of euthyroidism, antithyroid treatment should not be interrupted and the patient should be protected against infection, trauma, unnecessary procedures, surgery or other situations which add to the metabolic burden. When these are unavoidable, treatment for storm should be instituted as a prophylactic measure. The mortality rate of storm has been reduced from approximately 60 to 70% to near 25% by the use of reserpine and steroid hormones, in addition to iodine and antithyroid drugs. It is anticipated that the use of these agents whenever thyroid storm is imminent will further reduce the mortality from this serious complication of uncontrolled thyrotoxicosis.—(*Annals of Internal Medicine*, March 1960).

OXYGEN THERAPY

Although oxygen inhalation is good therapy for respiratory deficiency of any kind, it may be accompanied by dangerous sequelae if the oxygen is administered incorrectly.—(*N.Y. St. J. Med.*, April, 1960).



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GLEANINGS FROM THE MEDICAL PRESS

MEDICINE & THERAPEUTICS

Acute renal failure in Asiatic cholera: clinicopathologic correlations with acute tubular necrosis and hypokalaemic nephropathy.—(*Annals of Internal Medicine*, May 1960).

Progressive uraemia has long been recognized as a late and often fatal complication of Asiatic cholera. In 1921, anuria in cholera was attributed by Rogers to a fall in blood-pressure leading to impaired circulation through the kidneys. Two decades later, Tomb stated that the renal pathologic changes in cholera resembled those seen in renal anoxia, a concept supported by Wilkinson and by Maeraith *et al.* De, Sengupta *et al* further clarified the pathogenesis by differentiating between the typical initial anuria of the haemoconcentrated cholera patient with circulatory collapse and the less common occurrence of true acute renal failure.

Benyajati *et al* define the renal pathologic process in patients who succumbed to cholera gravis. These cases were part of a large series studied by clinical and laboratory methods. The findings of acute tubular necrosis and hypokalaemic (or kaliopænic) nephropathy suggest a rational approach for the prevention, recognition and treatment of these complications.

1. Thirteen cases (including five with necropsy findings) from a group of 134 adult patients with classic Asiatic cholera are reported because they exhibited acute renal failure as a complication of their disease.

2. Acute renal tubular necrosis, with varying degrees of superimposed or coexisting hypokalaemic nephropathy, was the pathologic lesion responsible for acute renal failure in these patients.

3. A practical interpretation of clinical and pathological findings implies that prompt and adequate fluid therapy is necessary to prevent or to lessen the severity of acute

tubular necrosis in cholera. This complication should be considered in the initial evaluation and treatment of cholera patients.

4. The frequent finding of hypokalaemic nephropathy in this study suggests that potassium repletion should be considered early in the therapy of acute cholera.

Idiopathic pulmonary hypertension.—*J. Mt. Sinai Hospl.*, N.Y., 27: 3, 1960).

In the diagnosis and treatment of patients with pulmonary hypertension it is necessary to consider several ætiological possibilities. Since the level of pulmonary arterial pressure is a product of pulmonary vascular resistance and volume of flow, increases in either of these factors should theoretically result in an increase in pulmonary arterial pressure. However in as much as the normal pulmonary vascular bed can expand sufficiently to accommodate up to three times the resting systemic flow with little resultant pressure elevation, significant, persistent pulmonary arterial hypertension is usually associated with an increased resistance to flow through the pulmonary circuit. Factors increasing the volume of flow through the lungs are of greater importance in accounting for an increase in pulmonary arterial pressure when there is coexisting organic or functional restriction of the pulmonary vascular bed.

Idiopathic pulmonary hypertension is an entity which has been described with increasing frequency but whether this represents a real increase or simply reflects the increasing number of catheterizations being performed is difficult to determine. The disease has been described at all age levels.

The principal symptoms associated with idiopathic pulmonary hypertension are:—Chest pain (dilated PA: "angina"), Syncope (Reflex; right heart failure), dyspnoea and tachypnoea, generalized weakness and hæmoptysis; hoarseness (rare).

The clinical findings in idiopathic pulmonary hypertension are:—80% female (mainly 20-40), prominent jugular A-waves, clear lungs, RVH-parasternal heave; loud P-2, non-specific systolic and diastolic murmurs or no murmur, and hepatomegaly, jaundice, oedema, ascites, clubbing, cyanosis.

It is usually a progressive and fatal disease, having been seen in all age groups but generally affecting young females. Since its clinical features of dyspnoea, chest pain, weakness, syncope, variable murmurs, right ventricular hypertrophy and, terminally, cyanosis and right ventricular failure, may often be confused with those of other lesions causing advanced pulmonary hypertension, newer diagnostic methods, utilizing dye dilution curves or inhalation of radioactive gases, are often necessary.

Pathological examination of the pulmonary vascular tree reveals evidence of widespread organic vascular lesions of sufficient magnitude in the great majority of cases to account for the elevated pulmonary vascular resistance. However, an initial functional, vasoconstrictive element may be present. Current attempts at treatment utilize pharmacologic agents which selectively alter the pulmonary vascular resistance, and promising, though transiently effective, results have been recently obtained with *acetylcholine injected directly into the pulmonary artery*.

Early diagnosis of lung cancer.—William G. Cahan, M.D., Associate Attending Surgeon, Thoracic Service, Memorial Centre, New York, writes in the *G.P.*, for April 1960:—

The early diagnosis of lung cancer can be made only if one suspects its presence. This suspicion can be aroused by symptoms or by finding an equivocal shadow in a chest X-ray.

In either of these basic situations, the method of establishing the presence or absence of lung cancer should proceed in an orderly fashion. During the necessarily complete history and physical examination, it is worth while

to note carefully any chronic exposure to inhalable irritants. When a patient over 45 years of age gives a history of having smoked more than a packet of cigarettes a day for over 20 years, automatically one should begin to be interested in the possibility of the effect of the irritant. The patient's environment should also be scrutinized, e.g., long-standing contact with fumes, chemical or gaseous exhausts and sources of radioactivity etc.

"Cigarette cough":—The duration and productivity of the cough are of importance. A so-called "cigarette cough" by its very prevalence tends to be regarded as a normal condition and is loosely used to cover a wide variety of respiratory irritations. For the most part, it is a cough initiated by the first or second cigarette of the day and may be dry or productive of a little whitish material composed of saliva or sputum. The cough for the rest of the day is usually dry and has become so accepted by the patient that he may not even be aware of its presence. Not only may the quantity of the sputum alter, but the actual physical characteristics may change from a thin, white, watery material to a viscid substance that can be yellow, green, black-flecked or gray. Blood flecking may actually be present also; this transition from a chronic, mild, irritative type of cough to the more worrisome form may well reflect a subtle change in the bronchial mucosa and perhaps represents the alteration to cancer itself.

Cough in the previously noncoughing subject:—The other type of cough is that occurring in a previously noncoughing subject, which persists and progresses for more than three or four weeks. Most of these will be episodes that are easily attributable to upper respiratory infections. However, in those subjects over 40 years of age the possibility of a neoplasm rather than an infection must be entertained.

Other symptoms which might antedate or overshadow the cough itself include chest pain, which can often resemble that of cardiac or pleuritic origin, anorexia, migratory bone and

joint pain, weight loss and dyspnoea. In fact, lung cancer can be called the "great masquerader."

In a patient suspected of having lung cancer, there are two "do's" and one "don't" that may accelerate the diagnosis. The first "do" is to give the patient who is raising sputum a 3 or 4 oz. bottle half-filled with 50 per cent isopropyl alcohol. He is instructed to deposit the product of a deep cough into this bottle. The patient carries the bottle with him for the purpose of depositing any true specimens he may raise during the day. When two good representative sputum specimens have been deposited in the alcohol they should be examined by a cytologist. A negative finding, of course, does not mean the absence of cancer. But if a positive report is forthcoming, acceleration of the patient's care is possible.

The second "do" is to obtain an X-ray of the chest. The usual postero-anterior view should be accompanied by a right or left lateral view, as well, to uncover those lesions sometimes hidden by the cardiac shadow.

The "don't" is to subject a patient with a suspicion of lung cancer to isolated fluoroscopy as a method of diagnosis and screening. This means the use of fluoroscopy alone to review the contents of the chest. Unfortunately, it is a common practice and the reassurance gained by a seemingly negative image is often inaccurate. Often it is not possible to allow the eyes to become fully accommodated before fluoroscopy, and small lesions may escape detection. By contrast, the X-ray film affords an opportunity for deliberation, and what is more important, provides a tangible record for future references. In addition, the amount of radiation exposure from having an X-ray film is 1/10th to 1/100th that of isolated fluoroscopy of the chest.

Finding a shadow in the lung of a patients with symptoms requires aggressive action until its nature is resolved. The same is true of shadows that are asymptomatic. These are being found in increasing numbers be-

cause of the widespread use of chest surveys by various industrial concerns, armed forces, tuberculosis associations and cancer detection clinics. The fact that they are asymptomatic must not be interpreted as necessarily meaning that they are nonlethal. In such a situation, any previous films should be obtained for comparison to determine whether the shadow is of long-standing or a new arrival. Moreover, if the shadow warrants, efforts to obtain help from exfoliative cytology are made.

Recently a machine has been devised which will produce sputum in most individuals in a simple and harmless fashion; the principle is to nebulize a warm solution composed of hypertonic saline and propylene glycol. This mist is inhaled by the patient from one to 15 minutes. The bronchorrheic action of these chemicals and the mist itself soon result in a cough and sputum production. These specimens are very acceptable to the cytologist. In fact, in at least eight instances, it has been the only method of diagnosis of lung cancer where X-rays, spontaneous sputum and bronchial washings have failed.

Bronchoscopy:—The other aggressive action to be instituted in the presence of a shadow in chest-X-rays is bronchoscopy. During this procedure one may obtain a biopsy, but as earlier cancers are encountered, greater reliance has been placed upon bronchial washings as a method of detection.

Diabetic neuropathy.—(*Annals of Internal Medicine*, May, 1960).

Involvement of the nervous system in diabetes has long been recognized. Despite many studies, there still remain considerable doubt and lack of specific knowledge concerning many aspects of this complication. The very diagnosis itself presents a problem, in view of the absence of pathognomonic symptoms, signs or laboratory findings, as well as the lack of any specific pathologic picture. Agreement has, however, been expressed in the literature by many authorities con-

cerning the background for the development of diabetic neuropathy. This has been generally assumed to follow a prolonged period of poor diabetic control.

In his experience Dr. Ellenberg found that (a) neuropathy may however, occur during good control.

(b) There may be the simultaneous onset of neuropathy and the symptoms of uncontrolled glycosuria.

(c) The neuropathy is unrelated to the duration or severity of the diabetes.

(d) Neuropathy may be the initial clinical manifestation of diabetes, unattended by symptoms of hyperglycemia and glycosuria.

(e) The paradoxical precipitation of neuropathy following institution of good control by diet, insulin or tolbutamide has been observed.

(f) Neuropathy may follow stress situations; in these instances, a relatively constant latent period exists.

1. Various situations preceding the onset of neuropathy in diabetes are independent of the state of control of the diabetes, and hence negate the contention that a prolonged period of poor diabetic control is essential for the development of the neuropathy.

2. Diabetic neuropathy should be regarded as an essential and integral feature of the syndrome of diabetes mellitus, rather than as a complication of the disease.

3. Awareness of the occurrence of neuropathy as the initial clinical manifestation of diabetes, and the diagnostic application thereof, may help to solve some obscure clinical problems.

4. The diverse character of the factors preceding the onset of diabetic neuropathy suggests that there may be several etiologic determinants.

5. The sequence of neuropathy following stress situations after a relatively constant latent time interval suggests the presence of an operative toxic or metabolic factor in these instances.

Study of antibiotic prophylaxis in patients with acute heart failure.—(*New England Journal of Medicine*, via *N.Y.S.J. Med.*, 15-6-1960).

A double-blind study of 150 randomly selected patients (72 treated, 78 controls) failed to support the suggestion that antibiotics be given routinely to prevent pulmonary infections in patients with congestive heart failure. As a preferred alternative, the authors suggest that special care should be taken to discover pulmonary infection early and then treat it vigorously with appropriate antibiotic agents. A total of 38 patients died, 21 in the antibiotic prophylaxis group and 17 in the placebo group.

Either clinically or at autopsy, 8 of the antibiotic group were found to have had pneumonia, as against 6 in the control group. Of this total of 14 known pneumonia cases, 4 recovered on penicillin (3 of these had been on placebo and 1 on antibiotic prophylaxis). Of the 10 who died, 3 had been on the placebo and 7 on the antibiotic. In 6, lung infection was incidental to other causes of death, but in 4 (1 on placebo and 3 on antibiotic) it was a major factor. That radiologic examination remains a relatively accurate method of detection of pneumonia is indicated by the fact that pneumonia was missed by the radiologist only twice in 112 patients. Pneumonia was present in 10 of 28 patients in whom it was suspected from the chest X-ray film. Other clues are purulent sputum, temperature of 101°F., for at least three days, and white cell count over 15,000.

Subacute granulomatous thyroiditis.—(*Annals of Internal Medicine*, May, 1960).

Subacute granulomatous thyroiditis has been described by many names. Commonly used synonyms are: giant cell thyroiditis, pseudotuberculous thyroiditis, acute simple thyroiditis, acute nonsuppurative thyroiditis and de Quervain's thyroiditis. While the onset is acute, the

disease may run a variable course of indefinite duration. Chronic granulomatous thyroiditis, which some authors have described as a separate disease entity, is but a long-term variant of subacute thyroiditis.

The cause of the disease is uncertain. It must be distinguished from bacterial thyroiditis, which takes a very acute course, and may or may not lead to suppuration within the gland.

It has shown a considerable rise in incidence, possibly because the correct diagnosis is made more frequently.

The cause is not known. It may be caused by a virus infection, possibly by transmission from the upper respiratory tract. There is an increasing body of evidence that subacute thyroiditis may be an auto-immune disorder, characterized by sensitization of the patient against his own thyroid.

Symptoms consist of fever, painful localized swelling of the gland, and signs of mild hyperthyroidism. The most outstanding laboratory finding is a reduced radioactive iodine uptake with a normal or high protein-bound iodine. In severe cases the protein-bound iodine may show a transient drop. This is associated with a stage of clinical hypothyroidism.

Recovery is spontaneous. It can be accelerated in some cases by radiotherapy or adrenocortical steroids.

Digitalis intoxication.—(*U.S. Armed Forces Medical Journal*, April, 1960).

The increased sensitivity of primary hypokalaemic states to digitalis is well established. The ability of potassium to suppress arrhythmias and to correct digitalis intoxications is also well known. The relationship between potassium and digitalis at the level of the myocardial cell remains indistinct, although digitalis effects are associated with potassium migration across the cell boundary. Whether digitalis depletes cellular potassium or interferes with active transport of potassium into the cell has not been determined. It is generally agreed, how-

ever, that digitalis-overdosage causes intracellular potassium depletion, the severity of the reaction being roughly proportional to the extent of depletion, and the extent of the overdosage. . . . Most instances of digitalis toxicity are unrelated to primary potassium effects but are associated with accidental overdosage or well-intended but unrealistic digitalization and maintenance regimens. The proper dose of digitalis is always an individual pharmacologic experiment necessitating constant monitoring of clinical and electrocardiographic alteration. Adherence to prescribed routines unrelated to size or clinical condition of the patient is perhaps the most frequent cause of digitalis intoxication. Other instances of digitalis intoxication may be related to communication difficulties between physician and patient. The physician must insure that neither his own semantic difficulties nor the patient's lack of attentiveness or comprehension are permitted to interfere with proper instruction in the use of the potentially hazardous drug. Perhaps of equal importance is careful education of patients in the early signs of over-digitalization. The physician himself should recognize early clinical and electrocardiographic signs of digitalis intoxication.

Dangerous potentiation of pethidine by iproniazid, and its treatment.—*B.M.J.*, 13-8-1960).

Iproniazid, a close chemical relation of isoniazid, was first introduced for its antituberculous action. It was noted to have a euphoriant effect, and for this reason has been used in psychiatry, in the treatment of depressive states. This antidepressive effect is possibly due to its being an inhibitor of mono-amine oxidase. It has recently become popular in cardiology, for use in cases of intractable angina pectoris.

Mitchell (1955) reported the case of a patient, receiving treatment for tuberculosis with iproniazid, who developed nausea and muscle twitching 20 minutes after being given 100 mg. of pethidine. He became cyanosed, was sweating, and had a rapid pulse,

exaggerated tendon reflexes, ankle clonus, and a bilateral extensor plantar reflex. The attack subsided within 36 hours.

Dr. Shee describes two further cases which, on a similar combination of drugs, developed reactions even more frightening and dramatic than that referred to the reversal of the syndrome by the intravenous injection of prednisolone was rapid.

It is emphasized that the two cases of pethidine-iproniazid coma although both had severe ischaemic heart disease, showed no evidence of circulatory distress during the reaction.

A possible mode of action is that when pethidine encounters iproniazid or its degradation products in sufficient quantity in the body, it forms a loose chemical combination which initially causes cerebral irritation and, in higher concentration, coma; and that this chemical combination is specifically blocked or reversed by prednisolone.

Angina patients are particularly liable to develop cardiac infarction and to be admitted to hospital under the care of physicians not fully acquainted with their previous medical histories, and may be given pethidine for the relief of their pain. It is suggested, in the light of the two cases reported here and that reported by Papp and Benaim, that iproniazid be reserved for the most intractable cases of angina, and be given only where all other measures have failed. *If a patient on iproniazid has to be admitted to hospital for any reason, his introductory letter should state, "No pethidine, please."*

Two cases are described in which patients receiving iproniazid for angina pectoris were precipitated into rapid and deep coma by the injection of pethidine.

In each case intravenous prednisolone appeared to cause immediate and specific reversal of the reaction.

Hæmaturia: (Comparison of chemical with microscopic examination by a simple rapid tablet test).—(*J.M.S.M.S.*, May, 1960).

Longfield *et al* of Flint, Michigan, describe the results of studies in the Department of Pathology at Hurley Hospital in which the accuracy of the rapid tablet test (Occul-test) was compared to microscopic study of routine urine specimens for the presence of erythrocytes. In addition, particular attention was paid to the possible effect of the presence of large numbers of leucocytes on the tablet test results.

Two thousand seven hundred random urine specimens up to twelve hours old from newly admitted and inpatients were checked independently of the microscopic examinations for the presence of varying amounts of blood by a rapid tablet test; the test tablet reagent method is based on the property of the peroxidase-like activity of the blood cells to reduce peroxide and liberate oxygen. The oxygen is detected in an acid medium by orthotolidine. Orthotolidine and strontium peroxide are compressed with tartaric acid and calcium acetate into a tablet. Oxygen liberated from strontium peroxide when reduced by peroxidase is detected by the orthotolidine; the tartaric acid and calcium acetate supply the necessary acidity.

TECHNIQUE:—One drop of urine is placed on a piece of filter paper. A test tablet is placed in the centre of the moist area and two drops of water are placed on the tablet so that they will run down on to the paper. If a significant amount of blood is present, a distinct blue area forms within two minutes on the paper surrounding the tablet; if negative, the paper does not change colour even though the tablet turned slightly bluish. Only the discolouration of the filter paper is considered of significance.

Microscopic and chemical testing were performed independently and without knowledge of the results on corresponding samples.

Of the 2,700 specimens examined, 948 showed the presence of varying amounts of blood with the Occul-test, on microscopic study, or by both methods. This figure (35.1 per cent) was a rather high proportion of the total and was partially attributable to

receipt of many uncatheterized specimens from females and many specimens from the obstetrical service.

The number of leucocytes seen on microscopic examination was also compared to Occul-test results.

A positive Occul-test in the presence of small or large numbers of leucocytes was in all instances accompanied by microscopic evidence of erythrocytes.

The presence of small to innumerable leucocytes in the specimen does not influence the test results. The test should not be considered a substitute for careful microscopic examination but is valuable in the detection of occult blood, particularly in the frequent instances where hæmolysis has occurred.

SURGERY

Incidence, intensity, and duration of post gastrectomy symptoms.—(*N. Y. State J. Med.*, 1-6-1960).

In the therapy of duodenal ulcer there are two major factors to be evaluated in judging the effectiveness of any surgical procedure. One is its ability to prevent ulcer recurrence, and the other is the incidence, intensity, and duration of symptoms caused by the operation itself. Simple gastroenterostomy leaves the patient quite comfortable as far as side-effects are concerned but fails to protect adequately against recurrent ulcer. The addition of vagotomy to gastroenterostomy has reduced this recurrence rate somewhat, but it still is reported to be as high as 9 to 15 per cent.

An attempt has been made to establish the incidence, intensity, and duration of symptoms caused by the operative procedure *per se* in a series of 441 duodenal ulcer patients treated by a two-thirds to three-fourths gastrectomy to which vagotomy was added in 217. Three hundred ninety patients were followed-up. Gastrojejunal ulcer occurred in 8.9 per cent of the gastrectomy-vagotomy group.

One hundred (approximately 25 per cent) of the patients had some symptoms attributable to the operation. There were 16 patients (4 per cent) who suffered from the dumping syndrome, 3 (0.7 per cent) from alimentary hypoglycæmia, 37 (9.5 per cent) from a variety of dyspeptic symptoms, 19 (4.9 per cent) from abdominal pain, 10 (2.5 per cent) from recurrent vomiting, and 27 (6.9 per cent) from diarrhoea.

In about half of those patients with pain, diarrhoea, or weight-loss the symptoms eventually disappeared, but in only 4 of 16 of those patients with dumping and in only 7 of 37 with dyspepsia did the symptoms abate completely. The remainder continued to have symptoms for the duration of the follow-up. In most patients the symptoms became milder as time went on, and the reasons for this have been discussed. In about 1 per cent of all the patients the symptoms were severe enough to condemn the operation as a failure.

The result of adding vagotomy to the resection seems to have influenced the incidence of some of these symptoms. It did not alter the incidence or intensity of dumping but in the vagotomized patients dumping persisted longer. Vagotomy did not affect the incidence of pain or the dyspeptic symptoms. Diarrhoea was much more frequent (20 to 8) and more persistent (13 to 1) when vagotomy was added to gastric resection. This increase in side-effects induced by vagotomy is more than compensated for by the low ulcer recurrence rate in the vagotomy group, 0.5 per cent as compared with 8.4 per cent. Therefore, the authors advocate *gastrectomy and infradiaphragmatic vagotomy as the procedure of choice in the treatment of duodenal ulcer.*

Chemotherapy of burns.—(*Lancet*, London, 3-9-1960).

The local application of a prophylactic cream to burns of less than 15% (in children less than 10%) of the body-area was studied by Cason and Lowbury of the Research Unit,

Birmingham Hospital, in two controlled trials. The cream (N.C.P.) contained neomycin 2 mg., chlorhexidine dihydrochloride 1 mg., and polymyxin B 1 mg. per gramme, made up with cetomacrogol (B.P.C.) emulsifying wax. In the first trial the control patients' burns were dressed with tulle-grass, and in the second trial with penicillin cream (1000 units per g.).

Between a third and half of the burns dressed with N.C.P. cream in the first trial remained free from bacteria for 3 weeks. During that time *Staph. aureus* appeared on agar-cultures from 82/93 (88%) of the burns dressed with tulle-grass, but from only 15/75 (20%) of those dressed with (N.C.P.) cream; by similar tests *Str. pyogenes* appeared in 22/93 (24%) of burns dressed with tulle-grass, and in 4/75 (5%) dressed with N.C.P. cream. The prophylactic advantages of N.C.P. cream against the gram-negative bacilli were less. *Str. pyogenes*, *Staph. aureus*, and *Ps. pyocyaneus* from burns were always sensitive to N.C.P. cream. Clinical assessment in burns of full skin thickness also favoured N.C.P. cream e.g., 20/34 (59%) of skin-grafting operations failed (showing less than 80% take) when the burns had been dressed with tulle-grass, but only 2/20 (10%) failed when they were dressed with N.C.P. cream. The mean healing-time from the day of operation of burns treated with tulle-grass was 11 days longer than that of burns treated with N.C.P. cream.

In the second trial, *Staph. aureus*, *Ps. pyocyaneus*, and even *Str. pyogenes* were commoner in burns treated with penicillin cream than in those treated with N.C.P. cream.

Evidence from the two trials suggested that added infection with *Ps. pyocyaneus* can be partially controlled by a cream containing polymyxin, or (to a lesser extent) by keeping dry the surface under-dressings—e.g., by using tulle-grass.

In a small controlled trial on extensively burned patients, prophylaxis by systemic penicillin was compared with that of a combination of systemic chloramphenicol, tetracycline,

erythromycin, and polymixin. *Str. pyogenes* was not isolated from either group. Colonization by other bacteria was not less frequent in the burns of patients who had combined antibiotic prophylaxis than in those given penicillin. Among the patients who had penicillin were more cases of septicaemia and more respiratory complications. The numbers of staphylococci resistant to chloramphenicol increased considerably during the trial.

Since the introduction of treatment for *Str. pyogenes* infection of burns with a combination of erythromycin and tetracycline, no streptococci resistant to either of these antibiotics have been isolated from burns in the unit; but the frequency of streptococcal cross infection of burns has only been slightly reduced.

Pyribenzamine 2% aqueous jelly for topical anaesthesia of the urethra.—(J.A.M.A., 27-8-1960).

The clinical use of intraurethral anaesthetic agents during cystoscopic procedures has been associated with a significant incidence of local and systemic reactions. Such phenomena are secondary not only to the rich vascular supply and readily permeable mucosal surfaces of the urethra but to the specific antigenic nature of the various anaesthetic agents used. A number of allergic reactions to procaine hydrochloride (Novocain) and other procaine derivatives have been reported in the medical literature. A few fatalities due to the instillation of various anaesthetic agents intraurethally have been reported.

In a large series of cystoscopies within our urological surgical clinic, involving several thousand male and female patients, a significant incidence of sensitivity-reactions to topical procaine or similar anaesthetic agents was encountered. This was estimated at 3 to 5%.

Over a period of 12 months, 1681 total cystoscopies were carried out in the outpatient and hospital cystoscopy units in the Kaiser Foundation Hospital, Los Angeles. A total of 1,008

cystoscopic procedures were performed on male patients during this period; 270 were done under spinal anaesthetic and the remainder, performed on 738 men with various urological problems, were utilized in the evaluation of the clinical effectiveness of tripeleannamine aqueous jelly 2%.

A few minutes prior to the insertion of the cystoscope, 5 to 6 cc. of tripeleannamine aqueous jelly 2% was introduced into the anterior urethra with a suitable plastic adaptor. A penile clamp was applied to the glans, and the anterior and bulbous urethra were massaged to evenly distribute the anaesthetic agent throughout the entire urethra. The cystoscopic sheath was then thinly coated with the tripeleannamine jelly, the penile clamp removed, and the instrument inserted through the anaesthetized urethra.

The effective local anaesthetic action of antihistaminic compounds for urethral anaesthesia has been well established. It was apparent that the tripeleannamine (Pyribenzamine) aqueous jelly 2% was superior to other local anaesthetic products.

In a series of 738 male patients undergoing various urologic procedures tripeleannamine aqueous jelly 2% proved to be an extremely reliable local anaesthetic agent; no local or systemic reactions were encountered in the series. Tripeleannamine aqueous jelly 2% is recommended as a valuable clinical aid in the urological clinic.

Ice water as primary treatment of burns.—(J.A.M.A., 27-8-1960).

Patient with burns of all degrees involving less than 20% of the body surface were treated by immersion of the burned areas in baths of ice water or by applying ice-cold compresses as promptly as possible. In each of 150 cases, pain was immediately relieved and the extent of the redness and blistering visibly reduced. Local cooling was continued for several hours, until pain no longer returned when the part was taken out of the bath. No infections occurred in patients treated within one hour after the burn.

In virtually every instance the patients expressed profound relief and gratitude during and after treatment. No infections have been encountered in those patients treated within one hour of injury. Whereas pain ordinarily lasts 24 hours or more in the first-degree burn, relief in these patients was immediate, and the pain was almost totally absent by the time the patient left the office two or three hours later. The total length of time under treatment and the number of office visits have been reduced to about one third of that of patients treated otherwise. Since no two accidental human burns are identical, there was little room for exact comparisons, but the impressions received by nurses and physicians are unanimously in favour of this form of treatment.

This form of treatment has advantages in emergency care for lesser burns, since it is easily available, inexpensive, humane, and promptly effective.

The danger of becoming satisfied with standardized techniques.—(G. Crile, Jr., M.D., *Surgery, Gynaecology and Obstetrics*, July 1960).

The technical excellence of a surgeon's art is important, for it is this quality more than any other that makes his operations safe and effective. In the period of training it is an advantage for him to master the standard techniques so that they may become the scaffolding on which his surgical philosophy is built. Yet there are dangers in perfecting techniques: the dangers of becoming overly enamoured of the craftsmanship involved and of being reluctant to adopt new methods. The surgeon knows that employment of new techniques may, until they are mastered, result in a temporary increase in postoperative complications. As a result of this knowledge his operations may become over-standardized. The decision as to what operation should be performed may be made on the basis of what operation the surgeon does most expertly instead of what operation would be best for the patient. When

this happens and when a technique has become standardized too rigidly the operation may become a mere corollary to the diagnosis. In such cases the reflex centres of the surgeon have taken control. *It is the hand that guides the mind.*

Ruptured intervertebral disk in the industrial patient.—(Diagnosis, surgical management and prognosis, *Texas St. J. Med.*, April 1960).

Conservative management is usually indicated even when ruptured lumbar intervertebral disc is suspected. Severity and persistence of sciatic pain are important diagnostic signs. Any objective evidence of nerve root involvement strongly supports the diagnosis of ruptured disc. Myelography, justified only when reasonable suspicion of rupture results from careful examination, usually should be performed in industrial patient. Surgery is indicated when a positive diagnosis is made in a patient with great disability.

In a series of disc operations Bradford found 35 of his 114 cases were industrial. Four of these underwent combined fusion and intervertebral disc-surgery. Their average time to return to work was 9 months. Three patients were operated upon during litigation, chiefly because of positive myelography and symptoms compatible with ruptured disc but without clearly characteristic nerve root findings.

There are few emergency operations for ruptured intervertebral disc. The physician should beware of making the diagnosis unless sciatic pain is greater than residual back pain. Although incomplete radiation of pain occurs, radiation throughout the sciatic distribution is the rule. Severity and persistence of sciatic pain are important in the diagnosis as well as accentuation of this pain by coughing, sneezing, or straining. Objective findings of nerve root involvement, if definite, strongly support the diagnosis of intervertebral disc rupture.

In industrial patients, operation rarely should be undertaken without

both a positive clinical and a positive myelographic diagnosis.

The best surgical results will be obtained in patients with a single rupture. Diagnosis of multiple ruptures is often erroneously made in patients with degenerative disease of several discs with rupture of none. Multiple explorations should be done only under special indications; since morbidity is increased thereby.

Recurrent back disability is a common complication in patients who have undergone intervertebral disc surgery. The back joints are not usually weakened by the surgery, but are altered by the loss of function of the nucleus pulposus. Recurrent herniation or herniation at a new level after initial cure of sciatic pain is not uncommon, and probably occurs in as high as 5 per cent of patients operated upon.

OBSTETRICS & GYNÆCOLOGY

The sexual response.—(*Obst. and Gynaecol. Survey*, 15: 77, 1960, via *C.M.D.*, June 1960).

The sexual response is a complex phenomenon theoretically divisible into at least 3 components:—psychogenic, hormonal and anatomical. The importance of the first factor in the female is undisputed. The importance of the last 2 factors has been difficult to evaluate.

The average office case of dyspareunia and/or frigidity undoubtedly falls into the psychogenic category. Such patients are usually badly handled or neglected. The only dyspareunia clinic which I have ever seen is held in University College Hospital, London, in the department of Professor W. C. W. Nixon.

One wonders sometimes if any other factors are ever involved in the clinical aspects of frigidity. However, certain observations make it clear, at least to me, that endocrine aspects are of some importance. Thus, the patient who is receiving high dosage of testosterone for relief of symptoms due to recurrent carcinoma of the

breast almost invariably has an increase in libido. In fact in elderly women this is sometimes a very unpleasant and worrisome complication of the therapy. Less frequently patients who are receiving much smaller doses of testosterone for either endometriosis or premenstrual tension will volunteer the information that sexual activity is either more satisfying or more desirable during therapy. Similar observations led Dr. Greenblatt (*Am. J. Obst. and Gynec.*, 44: 658, 1942) to suggest the use of testosterone in frigidity. Unfortunately, in my experience, the majority of cases are caused by psychosomatic factors and cannot be relieved by any amount of hormone therapy.

Drs. Waxenburg, Drollich and Sutherland writing in *J. Clin. Endocrin.*, 19: 193; 1959, indicate that androgens do indeed play a role in female sexual responsiveness and that probable source of this androgen is the adrenal gland. That the adrenal may also initiate a male type of sexual response is indicated by the experience with patients who have congenital adrenal hyperplasia and have been reared as men. These women lead a perfectly satisfactory, and quite normal, male sexual life. The thought that the gonads have to do with procreation but not sex drive is a most intriguing one and makes the differentiation between the positive and the negative sex chromatin pattern a fine line indeed.

The function of the clitoris as an erotic sex organ has been commonly accepted and patients especially often feel that they have some anatomical abnormality when there is no orgasm response to intercourse. That this is generally not the case can be easily attested. However, as we have derived from talking to physicians concerning the amputation of the phallus in children with hermaphroditism, many apparently believe the clitoris is essential for orgasm. In this operation substantially the entire organ is removed as it has been our experience that a stump is often associated with priapism. In discussing the procedure most physicians seem to believe that

this will severely cripple the patient in her adult sexual life.

To investigate this possibility Dr. John Money has interviewed a number of patients who have had a clitorectomy for carcinoma and have found on careful questioning that orgasm has not been inhibited by the operation. As a number of these little girls whom we have operated upon grow up and marry, the answer will eventually be obtained. For the time being, we shall continue to regard the clitoris as one of the erotic sex areas, but not necessarily an essential one.

Transitory demineralization of the hip in pregnancy.—(*J. Bone Jt. Surg.*, October, 1959).

P. H. Curtis and W. E. Kincaid state that complaints of hip pain are comparatively frequent in pregnancy, but that to the best of their knowledge radiological changes seen in association with hip-pain in pregnancy have not previously been described. They proceed to describe three cases of a syndrome characterized by pain of varying severity in one or both hips or thighs, which develops during the last trimester of pregnancy. X-ray films show a spotty demineralization with sharply localized margins, involving one or both femoral heads, a small part of the femoral neck, and the acetabulum. In each of the three patients the pain subsided and the X-ray appearance returned to normal within several months of delivery. The authors state that they do not know the cause of this syndrome, but that they suspect it to be of neurogenic origin.

Breech presentation and delivery.—(*J. Obstet. Gynaec. Brit. Emp.*, Aug., 1959, via *Med. Jour.*, Australia, 30-7-1960).

D. Hay discusses a study of 218 single breech deliveries over a four-year period. The teaching and procedure of the Liverpool school have been broadly followed. Emphasis has been placed on careful prenatal assessment of cases and experienced obstetrical supervision at delivery. There were 84 cases of assisted breech deli-

very, 25 full breech extractions, 29 spontaneous breech deliveries, and 27 lower segment caesarean sections in a total of 165 breech deliveries of babies weighing 3 lb. 10 oz. and over. The corrected total mortality rate in this series was 1.2% after exclusion of 49 foetal deaths from other causes such as premature labour, foetal abnormalities, accidental haemorrhage, etc. The caesarean section rate of 16% in the corrected series was largely determined by the age of the patient (over 36 years), previous obstetric history and large babies. During the six years prior to this study the corrected foetal mortality rate was 5.6% and the caesarean section rate 17.5%. A trial of labour was carried out on 10 patients, of whom four came to caesarean section on account of incoordinated uterine action. Post maturity was exceptional among these patients. The author stresses the importance of the position of the foetal limbs in the prognosis of breech cases. The legs were extended in 141 cases and flexed in 42 cases. The breech with flexed legs is considered a potentially dangerous presentation on account of the increased risks of prolapsed cord, prolonged first stage and difficult second stage. The author advocates caesarean section in otherwise doubtful cases when the legs are flexed. The practice of pulling down a leg to encourage better pains in breech presentations with flexed legs is condemned. Cord presentation or prolapse occurred in eight of 42 breech presentations with flexed legs, while no case of prolapse of the cord was noted in cases with extended legs. The incidence of manual removal of the placenta in breech presentations with vaginal delivery was 13%, and delayed involution of the uterus occurred in 35%. The author considers that the chief danger to the foetus in breech presentations lies in the soft tissue resistance of an undilated cervix and the muscles of the pelvic floor and perineum. For this reason the Liverpool technique of "assisted breech delivery" is preferred to the "hands off the breech" method. Trial labour

in breech deliveries where there is doubt concerning disproportion is considered a safe procedure providing the obstetrician has excluded outlet contraction. Incoordinated uterine action is a dangerous complication in breech delivery, and, if persistent, is considered by the author to be an indication for caesarean section. He presents evidence that primary breech presentation is due to uterine abnormalities and that the practice of external cephalic version has no influence on the steady incidence of breech deliveries of about 3%. He considers it safer nowadays for the baby to be delivered either vaginally by the breech, or by caesarean section in selected cases, than to run the increased risk of external version, and therefore, he condemns the practice of antenatal external cephalic version. The increased use of lower segment section for selected breech deliveries is considered responsible for the low foetal death rate in this series. The relative safety of caesarean section for these patients is discussed and the author concludes with the dictum: "When the outcome of the foetus is in doubt (in breech presentation) it is safer to carry out caesarean section."

When not to transfuse.—(Physicians' responsibility in blood transfusion, *Surgery, Gynaecology and Obstetrics*, February 1960, via *U.S. Armed Forces Medical Journal*, Aug. 1960).

It is our firm conviction that far too many patients are being given single pint transfusions. These are justified in haemorrhage when the rate and duration cannot be anticipated, as, for example, in certain injuries, gastrointestinal bleeding, and operations such as radical mastectomy. Unfortunately, most are given for such things as minimal to moderate blood loss during surgery of lesser magnitude, transient hypotension due to syncope and various anaesthetic agents, false blood pressure readings due to loose tourniquet cuff, and post-operative haemoglobin determinations of 8, 9, or 10 grams. These situations are best met with simpler

measures, such as Trendelenburg posture, peripheral vasoconstrictors, and the use of ferrous sulphate. Each year millions of blood donors lose a pint of blood in from 6 to 10 minutes.

Is this an indication for transfusion? Many have reactions accompanied by pallor, sweating, cold extremities, and transient hypotension without requiring transfusion.

REVIEWS OF REPORTS

Publications of the U.N. Permanent Central Opium Board, and the Commission on Narcotic Drugs Economic and Social Council.

We have received four valuable reports and a cumulative Index for the period 1947 to 1959 from the United Nations, Department of Public Information, U.S.A., on the subject of Narcotics and their control, comprising summaries of the Annual Reports of Governments. The reports contain interesting and useful information and can be had from Messrs. Orient Longmans of Bombay, Madras, Calcutta and Delhi. The total cost of the 4 publications is 3 dollars 85

cents or £ 1/8 sh. in English currency.

Classification of Pharmaceutical Preparations—(W.H.O. Publication, 1960. Available in Messrs. Orient Longmans, Madras, Bombay, Calcutta and Delhi. Price sh. 3/6 or 60 cents.

This is a very welcome and useful publication as it contains important lists enumerating preparations which pharmacists in the 14 countries detailed in the pamphlet are entitled to supply only against a doctor's prescription. Though not strictly up-to-date, they will serve as a guide to the trade and profession.

BOOKS RECEIVED

An Atlas of Human Brain and Spinal Cord Sections—By W. HEWITT, M.B., B.S., M/s. Pitman Medical Publishing Co., Ltd., 39, Parker Street, London. W.C.2.

The Sturge-Weber Syndrome—By G. L. ALEXANDER and R. M. NORMAN, M/s. John Wright and Sons Ltd., Medical Publishers, The Stonebridge Press, Bath Road, Bristol-4.

A Text Book of Gynaecology—By K. M. MASANI, M.D. (Lond.), F.R.C.S., F.I.C.S. M/s. Popular Book Depot, Lamington Road, Bombay-7.

A Handbook of Tropical Diseases—By J. C. BANERJEA, M.B., M.R.C.P. (Lond.), and P. B. BHATTACHARYA, M.B., D.T.M. (Cal.), M/s. Academic Publishers, 11, Panchanan Ghosh Lane, Calcutta-9.

Clinical Medicine—the Modern Approach—By A. E. CLARK-KENNEDY and C.W. BARTLEY, M/s. Pitman Medical Publishing Co. Ltd., 39, Parker Street, London. W.C.2.

French's Index of Differential Diagnosis—By Arthur H. DOUTHWAITE, M.D., F.R.C.P. M/s. John Wright and Sons, Ltd., Medical Publishers, The Stonebridge Press, Bath Road, Bristol-4.

1. Differential Diagnosis of Yaws and 2. Child Guidance Centres—The World Health Organization, Palais des Nations, Geneva.

Shleep Ada-Filariasis in Ayurveda and Life Sketch of Pandit Madana Mohana Malaviya—By Dr. I. K. P. SHARMA. Dr. I. K. P. Sharma, A.M., A.C., Pentlandpet Cross Road, Mangalore-3.

NEWS AND NOTES

An Oral Polio Vaccine

The Haffkine Institute, Bombay may soon undertake the preparation of an Oral Anti-poliomyelitis Vaccine. The vaccine can be easily administered to a child which requires just three doses to develop immunity against the polio virus amongst infants. It is expected to cost much less than the imported injectable vaccine.

Refresher Courses in Child Health

Refresher Course in Child Health of six weeks' duration for general practitioners will start in January, 1961. Intending candidates should register their names with the Director, The Institute of Child Health, at 95, Dilkhusa Street, Calcutta 17, on or before December, 15, 1960. A nominal fee of Rs. 10/- will be charged.

The Indian Pharmaceutical Congress

The 13th Session of the *Indian Pharmaceutical Congress* will be held at New Delhi during the last 3 days of December. Further details can be had from the General Secretary of the Association at 14, Ganesh Chandra Ave., "Kent House," Calcutta 13.

14th W.H. Assembly

The invitation of the Government of India to hold the 14th World Health Assembly in New Delhi in February, 1961, has been accepted. India will meet \$250,000 of the extra costs involved.

World Congress of Ophthalmology

The U. S. Government has made a grant of \$10,000 (Rs. 47,600) to a committee formed in India to organize the 19th session of the International Congress of Ophthalmology: to be held in New Delhi in December 1962, according to an U.S.I.S. release.

Pharmacy Courses**Continuance of English Medium Urged**

The Pharmacy Council of India, which recently concluded a three-day session of its 15th annual meeting at Cochin, has recommended for the State Pharmacy Councils to use as far as possible qualified personnel available in the drug control organization to implement the provisions of the Pharmacy Act 1948 in the States.

The council requested all universities to continue English as the medium of instruction for pharmacy courses until substantial steps were taken for the change-over to the national language.

It commended the Kerala Government's proposal to make the drug control administration an independent unit and requested it to appoint a qualified pharmaceutical chemist as the head of the Drug Analytical Unit proposed to be set up in Trivandrum.

Extension of ESI Benefits

On 2-10-'60 Sri R. Venkataraman, Minister for Labour and Industries, said the Employees' State (Health)

Insurance scheme would be extended to the families of workers after ascertaining the views of managements and workers.

Addressing a conference of representatives of managements, workers and Government to discuss the working of the Insurance scheme in the Madurai region, comprising Madurai, Ramanathapuram and Tirunelveli districts, the Minister said the scheme was in force in all establishments with 1,500 workers and was working satisfactorily because of the co-operation of workers and managements.

He said the State Government would increase the capitation fee per worker under the scheme from Rs. 6 to 13-50 when it was made to cover workers' families. This would be introduced in Madurai first if the employers were willing. He asked the employers' representatives to intimate the Government of their agreement to the expansion of the scheme by Nov. 1. The question of constructing a hospital in Madurai under the scheme was under consideration of Government.

Milk Powder Factory**Govt. Considering Proposal
Rs. 50-Lakh Project**

The Madras Government propose to set apart about Rs. 2.7 crores under the Third Five-Year Plan for the implementation of several schemes for the production of milk, milk products and their distribution under Co-operative schemes in this State. Details in this regard were discussed at an official conference held recently. Under the programme, there is a proposal to set up Butter-cum-Milk Powder Factory where it is proposed to convert milk into butter and milk powder. The cost of the project is estimated at Rs. 50 lakhs though its location has not yet been decided upon. Indications are that it might be set up either at Coimbatore or Tiruchirappalli. It is intended to transport surplus milk from different parts of the State to feed this factory.

Another allotment of about Rs. 80 lakhs has been made for improving milk supply in urban areas and also

for the establishment of "expansion units." The latter is a new scheme which aims at educating the rural people as also producers of milk on the scientific methods of production and distribution of milk.

An amount of Rs. 50 lakhs has been earmarked for expansion and installation of five more pasteurization plants in the State. There are only two such plants at present, one in Madras City and the other in Coimbatore.

There is a provision of Rs. 50 lakhs for evacuation of milch animals from major cities and setting them on the outskirts of the respective cities in colonies on a Co-operative basis. At least two cities would, it is stated be chosen for this purpose and one of them is likely to be Madurai.

New Drug For Cancer**Japanese Doctor's Claim**

A Japanese scientist has developed a new synthetic drug for the treatment of cancer, which eliminates the harmful side-effects of nitrogen-mustard previously used to attack cancer-cells.

The new drug, also based on nitrogen, was developed by Dr. Kanem Sakurai, Head of the Chemotherapy Department of the Japanese Pharmacological Institute. Dr. Sakurai told the International Cancerology Conference here yesterday that the drug was known as "Number 687" (the number of experiments required to perfect it), and could be used to kill cancerous cells without harming healthy ones.

As evidence of the effectiveness of the drug, Dr. Sakurai described an experiment in which two groups of mice were inoculated with cancer-cells. One group, which received no treatment died in 10 days. Among the second group, which was treated with "687", 95 per cent of the mice were still alive on the 26th day. Those that survived for 30 days were on the road to recovery.

Anti-Cancer Property of Milk

Whether milk had anti-cancer properties was hotly debated at the symposium on the geographic pathology of cancer here on the third day of the conference.

Dr. Takeshi Hirayama, of the National Institute of Health, said stomach cancer was rare among those who habitually drank milk and that the intake of too much salt was liable to bring on cancer.

Some foreign scientists objected that African and South East Asian peoples were not habitual drinkers of milk but did not have proportionately more cancer cases. Other foreign scientists endorsed Dr. Hirayama's view with experiments of their own.

Warning to be Issued

The conference is expected to draft a recommendation warning against the use of cancer-causing chemicals in the production of foodstuffs.

The 16-day conference is being attended by more than 200 experts and delegates from 34 countries. It has been sponsored by the International Union against Cancer and the Japan Cancer Association.

The scientists would also warn against the use of dangerous growth-stimulating hormones in cattle raising and the use of suspect insecticide in fruit-growing.

Preparations for the conference coincided with the first organized campaign against cancer in Japan. Cancer is one of the nation's major killers, killing one in every five in the 40 to 64 age group.

Medical Sciences Institute, New Delhi

A 650-bed hospital is proposed to be built at the All-India Institute of Medical Sciences in New Delhi at an estimated cost of Rs. 4.25 crores.

The Rockefeller Foundation had agreed to provide 500,000 dollars and the Technical Co-operation Mission had allocated a grant of Rs. 290 lakhs for the construction and development of the hospital.

Estimates amounting to Rs. 57.61 lakhs for the construction of the frame-work of the hospital during the Second Five-Year period was approved recently.

Control of Leprosy

Sri K. Kamaraj, Chief Minister, opened on 11-10-'60, the girls' section of the Government Children's Leprosy

Sanatorium on the Cuddalore Main Road at Yethapur, 21 miles from Madras City!

Ayurvedic and Unani Drugs Steps to Ensure High Standard

Both the Centre as well as the State Governments are now considering what measures should be taken to ensure that the Ayurvedic and Unani drugs are of standard quality, as a substantial portion of the country's population depends to a large extent on such drugs.

The ayurvedic drug industry is stated to be a developing one. The annual sales of ayurvedic preparations are estimated at six crores of rupees. It has come to the notice of Government that there is widespread adulteration of some ayurvedic medicines.

Another thing that has come to the notice of Government is stated to be the growing tendency among the manufacturers of Ayurvedic medicines to market composite drugs containing partly modern drugs such as aspirin, iron and ammonium citrate, vitamins, etc., and partly drugs falling within Ayurveda. Investigations made recently by the Drug Standard Control officers in the States revealed that these drugs were marketed under names which created the impression that they were pure Ayurvedic or Unani drugs. It is stated that taking cover under the exemption granted to *bona fide* Ayurvedic and Unani drugs from the provisions of the Drugs Act, the manufacturers of such drugs used indiscriminately modern drugs in their preparations without studying their properties in such composite formulations or the technique necessary to ensure that the potency of such drugs remains unimpaired.

The Central Council of Health which consists of the Health Ministers of the Centre and of the States considered this question at the 3 day meeting in Jaipur which began on 28th October, 1960.

Other things that were considered by the Council are family planning,

the progress so far made in the control of communicable diseases such as malaria, tuberculosis, leprosy, small-pox and cholera and the tightening up of the administration of Prevention of Food Adulteration Act in view of the "widespread" adulteration of food.

The Centre is of the view that any scheme devised for control of the quality of the drugs of different indigenous systems of medicine should leave the practising *Vaidyas* free and unfettered to prepare any medicine that may be required for the treatment of their patients. But the ingredients in an Ayurvedic or Unani medicine should be displayed on the label affixed to the container of such medicines and the manufacture of these medicines should be under hygienic conditions.

New Anti-Malaria Tablet

Production in U. S.

A new anti-malaria pill, which promises to be the most effective anti-malaria drug-combination developed so far, will soon be given to U.S. troops in Korea.

Resulting from Army-supported studies conducted by Dr. Alving of the University of Chicago, the new tablet combines two drugs used separately in the past for malaria prevention—Chloroquine and primaquine, both developed since World War II. Dr. Alving's investigations have been conducted under a contract with the Army Medical Research and Development Command, Washington, D.C.

Since 1951, chloroquine and primaquine have complemented each other in Malaria treatment although they have not previously been taken together in tablet form. New treatment procedure for military personnel in malarious areas will be the administration of one of the new tablets each week.

The Department of the Army said that Korea was one area where malaria was prevalent and the drug would be used there first.

The new pill has as yet been given no name.



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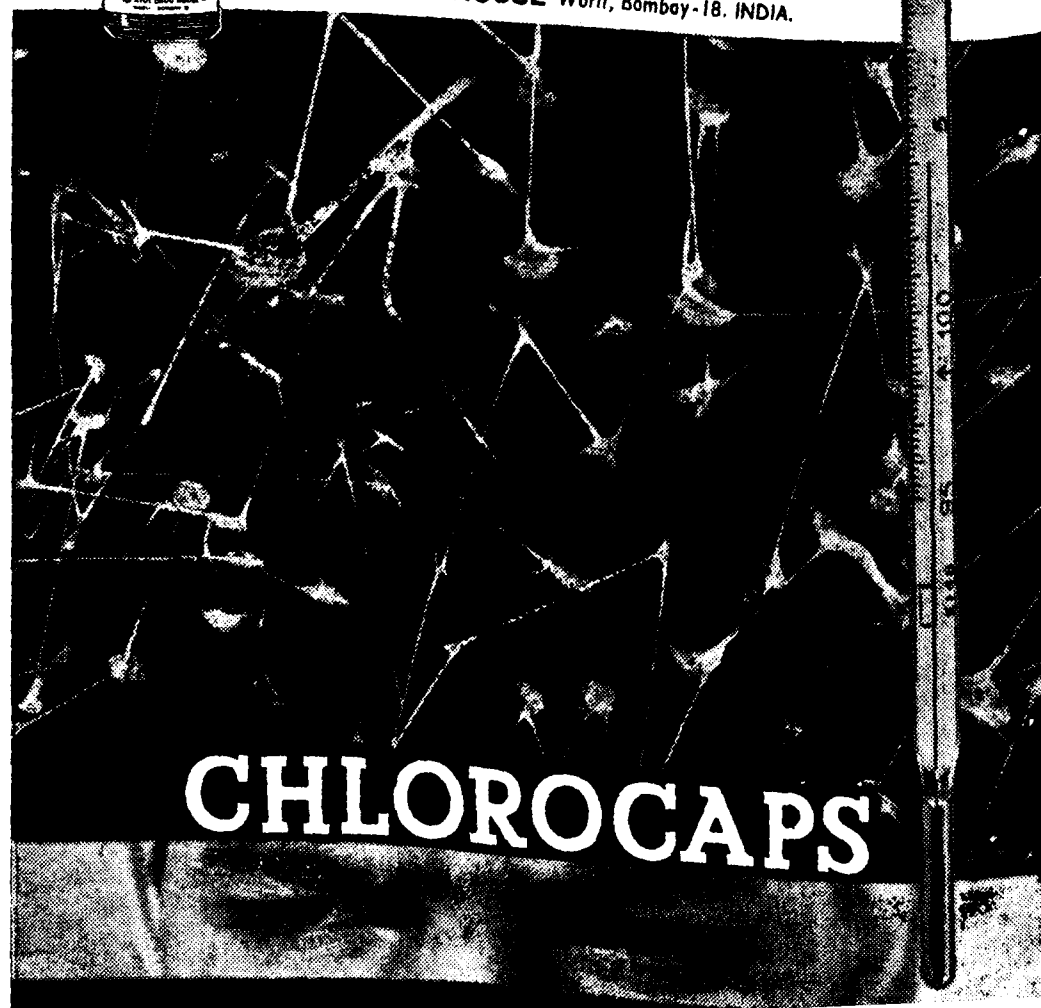
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It is now established beyond doubt that Chloramphenicol is the drug of choice in Typhoid and other gram-positive and gram-negative infections. In CHLOROCAPS you have 250 mgs. of Chloramphenicol, and the capsules are sealed in order to prevent any pilferage.

Available in vials of 12 and 100 capsules.

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Dear Doctor,

WATERBURY'S COMPOUND, the world famous tonic that helped to restore health and vitality to millions of people, is now enriched with Vitamins. In the new *WATERBURY'S VITAMIN COMPOUND* with its distinctive Saffron label, the original formula is fortified by the addition of Vitamin B₁, Riboflavin-5-Monophosphate-Sodium and Niacinamide. Creosote and Guaiacol have been omitted.

WATERBURY'S (Red Label) COMPOUND with Creosote and Guaiacol will continue to be available for your patients with coughs, colds and respiratory conditions generally. Both packs contain 480 ml. (16½ fluid ozs.)

We are sure that *WATERBURY'S VITAMIN COMPOUND* will benefit all those of your patients for whom you prescribe it.

Yours truly,

STANDARD LABORATORIES, INC.

EFFECTIVE CONTROL OF DIABETES

ORAL



In mild and moderately severe cases of maturity onset

DIABEMIDE

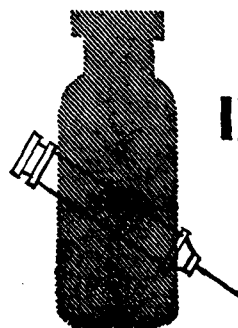
brand of Chlorpropamide

Dose: Initially: 2 tablets per day

Maintenance: 1-2 tablets per day.

Supply: Bottles of 30 scored tablets; each tablet containing 200 mg. of chlorpropamide.

INJECTABLE



For severe and complicated diabetics and juvenile cases, a wide range of

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Vials of 10 ml. 40 I.U. & 80 I.U. per ml.

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TABLETS

For the quick and efficacious relief from Nasal stuffiness, bronchial congestion associated with common cold, sinusitis, hay-fever, vasomotor rhinitis and the after-effects of respiratory infections.

Phenylephrine hydrochloride U.S.P.	5 mg.
Methapyrilene Fumarate	... 25 mg.
Salicylamide	... 0.4 g.
Caffeine B.P.	... 25 mg.

Available in the packings of 20, 100, 500 & 1000 Tablets.

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LIQUID

Each 5 ml. contains :

L-Lysine Monohydrochloride	... 0.3 g.
Pyridoxine hydrochloride U.S.P.	... 5 mg.

in a flavoured non-syrupy base.

Indicated in :

Stunted growth, protein malnutrition, for undernourished children, anorexia, listlessness and geriatric convalescent patients etc.

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INJECTION

(Antihistamine)

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Methapyrilene Fumarate	... 50 mg.
Chlorocresol B.P.	... 0.1 %
Benzyl Alcohol B.P.	... 2 %

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Also available in the forms of Tablets & Liquid Oral.

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(Combination of sulphamerazine and sulphathiocarbamide salt of p-aminomethylbenzenesulphonamide)

A POLYVALENT SULPHONAMIDE WITH BROAD-SPECTRUM ANTIBACTERIAL ACTION

- * Powerful action against both aerobes and anaerobes.
- * High therapeutic efficacy in very low doses.
- * No danger of crystalluria.

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Bottles of 250 & 1000 tablets of 0.5 g.



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A HAEMOSTATIC WITH TWO-PRONGED ACTION!
Shortens the Bleeding Time. Promotes Coagulation.

Indicated in:

Hæmorrhages of diverse etiology, such as pulmonary hæmorrhages, hæmorrhages from the nasal and pharyngeal cavities, the intestinal tract, the urinary passages, particularly of the bladder and prostate. Also metrorrhagia and menorrhagia. In abortion, if after curettage and ergot administration, hæmorrhage persists.

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Packings:

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is freely available
in all important
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VITAMIN A	2500 I. U.
VITAMIN B1	10 MG.
VITAMIN B2	100 MG.
NICOTINAMIDE B3	40 MG.
LIVER EXTRACT CONCENTRATE	65 MG.
GLUCACOL	0.017 CC.
SODIUM HYDROPHOSPHATE	50 MG.
CALCIUM HYDROPHOSPHATE	30 MG.
MANGANESE GLYCEROPHOSPHATE	10 MG.
COBALT CHLORIDE	2 MG.
COPPER SULPHATE B.P.	1 MG.
IRON OXIDE B.P.	0.065 CC.
SPIRITUS CHLOROPHORMI B.P.	9 CC.
WATER ROSEMARY B.P.	2 CC.
(ALCOHOL CONTENT 5%)	
WITH SALT EXTRACT AND AROMATICS	



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DOSE: 2 TO 4 TEASPOONFULS TWICE DAILY AFTER FOOD
OR AS DIRECTED BY THE PHYSICIAN.

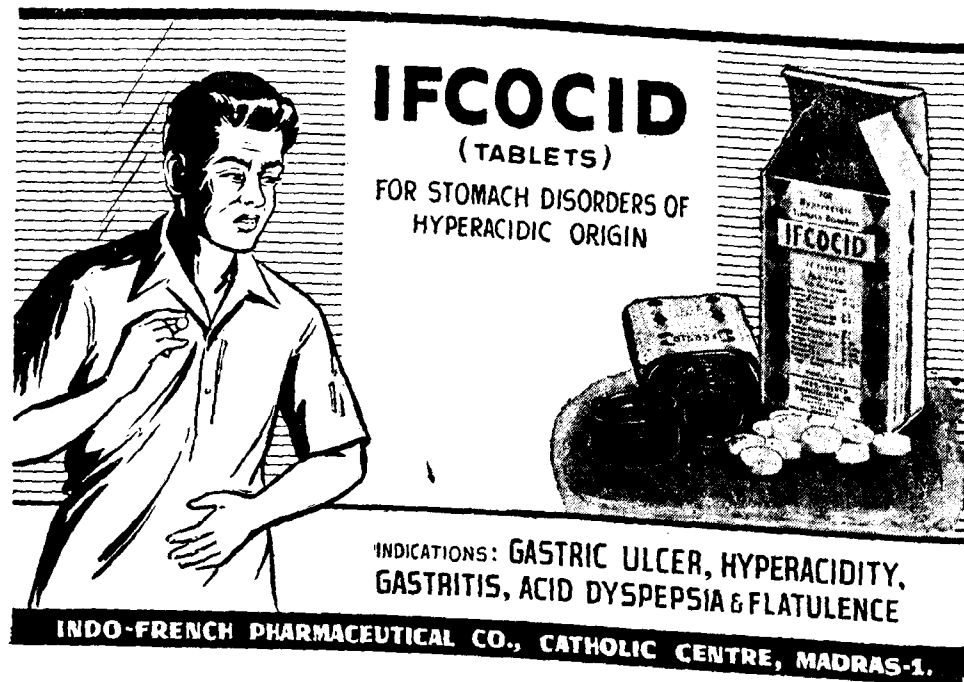
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FOR DIETARY DEFICIENCIES, MALNUTRITION, CONVALESCENCE AND AS AN ALLROUND TONIC AND RESTORATIVE FOR PATIENTS OF ALL AGES.
ADDITIONAL QUANTITIES OF VITAMINS ARE ADDED TO COMPENSATE FOR ANY LOSS IN STORAGE

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(TABLETS)
FOR STOMACH DISORDERS OF
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INDICATIONS: GASTRIC ULCER, HYPERACIDITY,
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HYDROCORTISONE LACTO-CALAMINE

the accepted
treatment for inflam-
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the well-known
topical application
soothing, protective

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The Lacto-Calamine base in Cortoderma protects patients from the risk of sensitisation attributed to some vehicles. (Practitioner, 1955, 175, 575)
CORTODERMA is available in 10 gramme tubes containing either 0.5% or 1.0% hydrocortisone acetate in a cream base of Lacto-Calamine.

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pain
with...

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tablets

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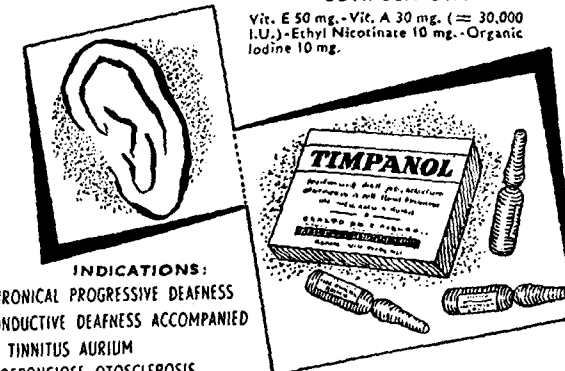
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FOR THE TREATMENT OF DEAFNESS

COMPOSITION:

Vit. E 50 mg. - Vit. A 30 mg. (= 30,000 I.U.) - Ethyl Nicotinate 10 mg. - Organic Iodine 10 mg.



INDICATIONS:

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- CONDUCTIVE DEAFNESS ACCOMPANIED BY TINNITUS AURIUM
- OTOSPONGIOSE-OTOSCLEROSIS
- HYPOACUSIA
- ATROPHIC RHINITIS
- ALTERATIONS OF THE TYMPANIC SENSIBILITY

No contra-indications
PACKAGING:
BOXES OF 6 x 1 cc. AMPULS.
WARM BEFORE USING.

DOSAGE:

2-3 INTRAMUSCULAR INJECTIONS WEEKLY, DURING TWO MONTHS, IN THE NON CHRONICAL FORMS;
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Specific cough suppression with local demulcent effect

The active constituent in Pectamol Linctus is oxeladin, in a vehicle which includes sodium chloride, menthol, chloroform, glycerin and glucose.

- **ACTION** Depresses the activity of the cough reflex.
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- **TOXICITY** Completely non-toxic. No constipation. No hypnotic effect. No habituation.
- **A product of B.D.H. Research**

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Adults: 1 or 2 teaspoonfuls
4 times daily.
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4 times daily.
PACK
Bottle of 60 mL



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LEADING ANTIBIOTIC SINCE 1950

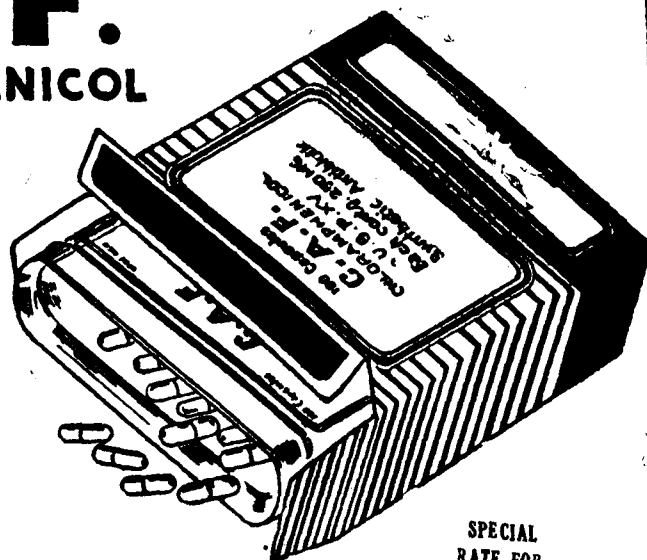
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PRICE		
12 Caps. Packet	3-50	
100 " "	22-50	
500 " "	107-50	
1000 " "	212-50	

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MIXTURE

IN 4 OZ & 16 OZ BOTTLES
WITH OR WITHOUT OPIUM



The relief afforded is soon observed as it rids all pain, facilitates digestion, neutralises excess of acidity and dispels the flatulency. In bowel complaints it has been taken with decided success. Recommended by the Medical Profession.



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IN WATER AFTER
FOOD WILL RELIEVE
ALL MENGE.

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MADRAS-3.

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Horlicks
again



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Horlicks is useful not only in acute illness and during convalescence, but in all conditions which are favourably influenced by correct dieting.

Horlicks

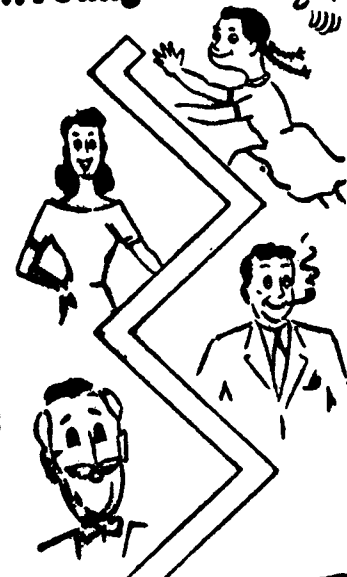
SWT-HL 1284

an ideal tonic



FOR ...

...Young & old



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HYDRABAD-DN.

Composition : 100 gms. contain :

Calcium Lactate 5.71 gms; Dicalcium Phosphate 3.43 gms; Magnesium Phosphate 1.41 gms; Asgandh 6.00 gms; Isharmul 2 gms; Brahmi 2 gms; Talispatra 2 gms; Thiamine Hydrochloride 38 mgms; Riboflavin 24 mgms; Niacinamide 276 mgms; Ascorbic Acid 436 mgms.

With traces of Copper and Iron.

For weak, rundown patients
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DEXTROSOL and GLUCOVITA



DEXTROSOL
is Anhydrous Dextrose, conforming to the U.S.P. and B.P. standards, its chemical formula being $C_6H_{12}O_6$

GLUCOVITA
Every 100 Parts contain :
Dextrose Monohydrate...99.4
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Each ounce of Glucovita is fortified with 250 I.U. of Vitamin-D (Calciferol)

DEXTROSOL: The purest form of Anhydrous Glucose on the market, it conforms fully to B.P. and U.S.P. standards.

GLUCOVITA: Fortified with Vitamin D.

Avoid substitutes!
Protect your patients by prescribing DEXTROSOL and GLUCOVITA.

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Agents for India: Parry & Co. Ltd.

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PENICILLIN OINTMENT 5000 IU/gm 20gms. ...	0-30
Penicillin Eye ointment 5000 I.U. gm./3.5 gms. ...	0-20
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UPBEE 1 (Vitamin B ₁) 100 mgms./ml. 10 ml. ...	0-55
UPCEE (Vitamin C) 500 mgms./ml. 10 ml. ...	0-80
UPBEE 12 (Vitamin B ₁₂) 100 mcgms/ml. 10 ml. ...	0-90
do do 200 do 10 ml. ...	1-40
do do 500 do 5 ml. ...	1-65
do do 500 do 10 ml. ...	3-00
do do 1000 do 5 ml. ...	3-10
do do 1000 do 10 ml. ...	5-75
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UP-B-COM FORTE (Vitamin B-Complex) Forte 10 ml. ...	0-57
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do (do) 100 mg 500 ,, ...	11-50
do (do) 100 mg 1000 ,, ...	21-50
UPBEE 2 (Riboflavin) 5 mg 1000 ,, ...	4-25
do do 10 mg 1000 ,, ...	6-25
UPBEE 6 (Vitamin B ₆) 5 mg 1000 ,, ...	9-40
do do 10 mg 1000 ,, ...	15-70
UPCEE (Vitamin C) 50 mg 1000 ,, ...	6-10
do do 100 mg 1000 ,, ...	9-40
do do 500 mg 500 ,, ...	19-65
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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.

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A bottle for clinical use sent per V.P.P. for Rs. 1-4-0

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SPEEDILY RELIEVES

HEADACHES, MIGRAINE,
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BABULINE
BUILDS
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INSIST ON TRIUMPH'S

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A.P.C. (B.P.C.)		per 1000	7.35
Calcium Lactate	0.32G	"	3.50
Calcium Gluconate	0.48G	"	5.55
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(Iodo-chloro-hydroxyquinoline U.S.P.)			
Sulphadiazine (S.D.Z. Mark)	50 mg.	per 1000	10.25
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Vitamin 'C'	0.25 G	100	12.20
"	50 mg. bot.	1000	6.75
Sodium P.A.S. Granules	100 mg. bot.	"	10.50
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	50 mg.	500	5.50

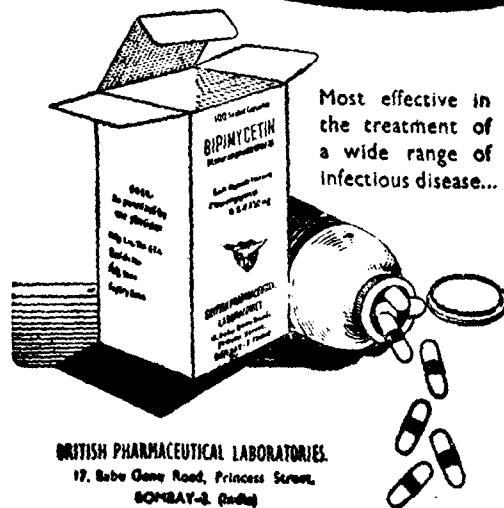
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 A DEPENDABLE ORAL ANTI-ASTHMATIC

FOR PROMPT RELIEF OF ASTHMA
 (Bronchial & Cardiac)

TABLETS
 Contains:- Ephedrine Hcl., Aminophylline, Caffeine Citras, Phenobarbitone, Sod. Arsenate, Belladonna & Calcium Gluconate.

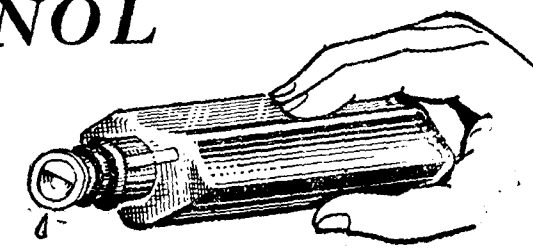
ELIXIR
 Contains:- Ephedrine Hcl., Aminophylline, Sod. Iodide, Sod. Benzoas, Caffeine Citras, Sod. Arsenate, Belladonna, Lobelia, Adatoda, Glycyrrhiza, Senega, etc.

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 NEVER GIVES RISE
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All kinds of Spasms & Colics of the Digestive tract, Urogenital tract, and also Respiratory tract.

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EACH TABLET CONTAINS:

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Amidopyrin ... 1.5/6 grs.
Phenacetin ... 2.1/2 grs.
Phenolphthalein ... 1/3 gr.
Atropin Methylnitrate ... 1/200 gr.

Available in packings of 25, 100 & 1000 tablets.

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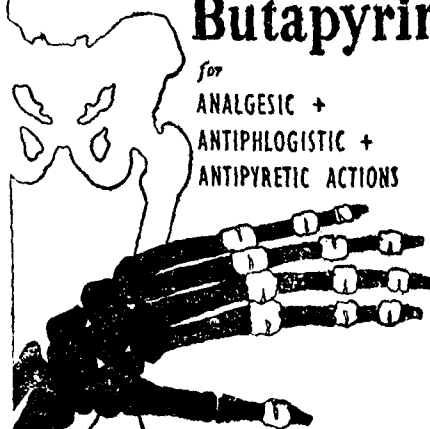
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Butapyrin

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ANALGESIC +
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ANTIPYRETIC ACTIONS



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COUGH SYRUP

for
Cough both acute and chronic in children and adult, cold acute and chronic, Bronchitis, Catarrh, Influenza.

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A well-recognised restorative tonic for Cough, Cold, Bronchitis, chest diseases, lack of appetite, mental fatigue, in all conditions after Pneumonia or Fevers, and during pregnancy or after child birth.

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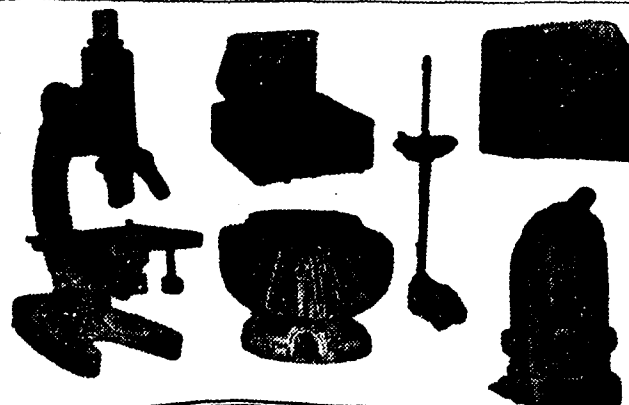
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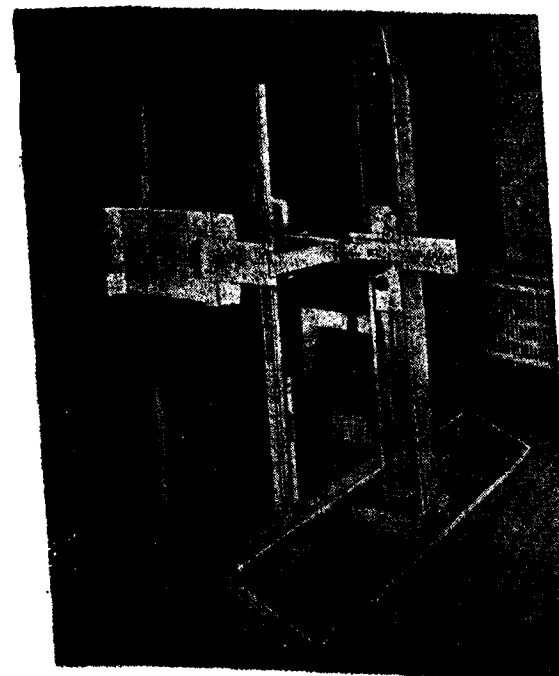
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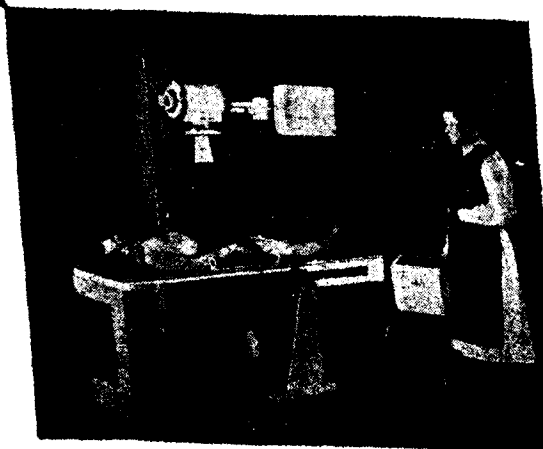


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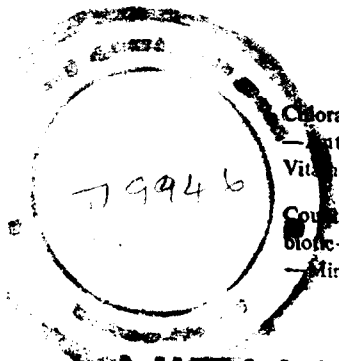
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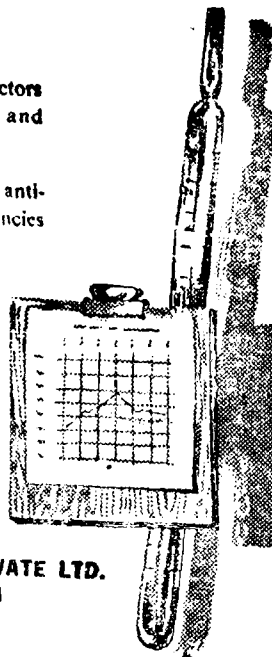
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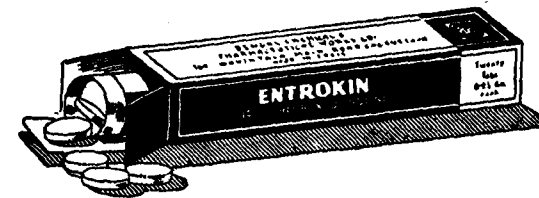
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