

THE ANTISEPTIC

1953

OCTOBER - 50-10

DECEMBER 50-12

348

The Antiseptic

A Monthly Journal of Medicine & Surgery

Founded by the late Dr. U. RAMA RAU in 1904. Published on the 15th of every month

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

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

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

London: 24, High Holborn W.C. 1.
Calcutta: 31, Beck Bagan Row

Telegrams: "ANTISEPTIC"
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New Delhi: G.P.O. Box No. 677
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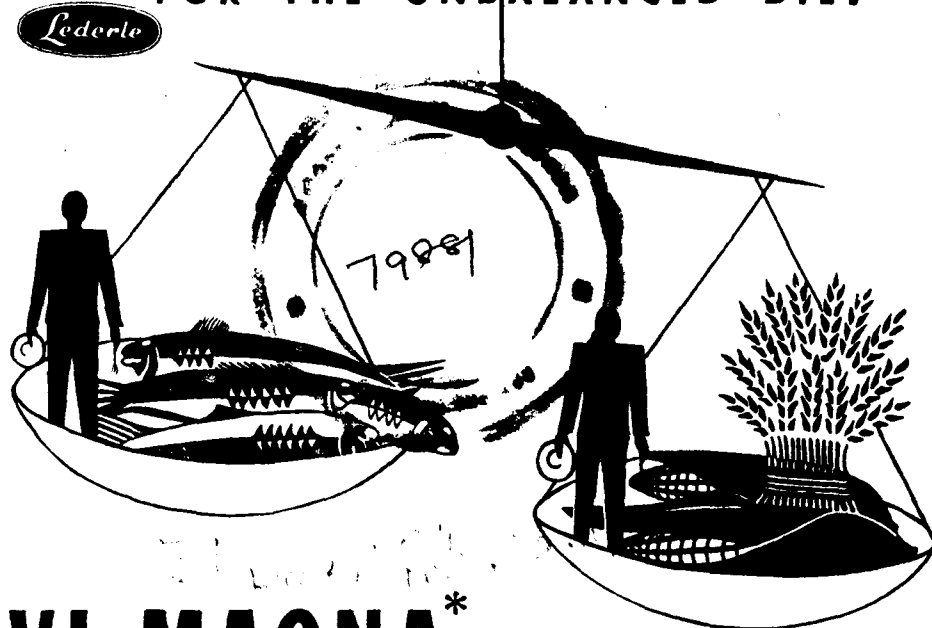
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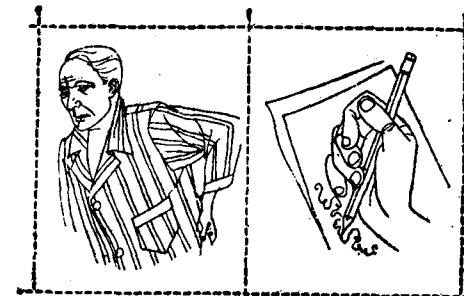
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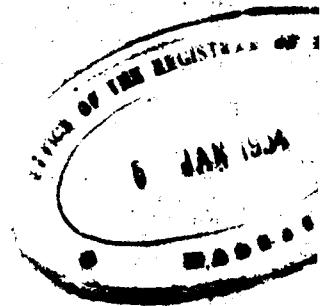
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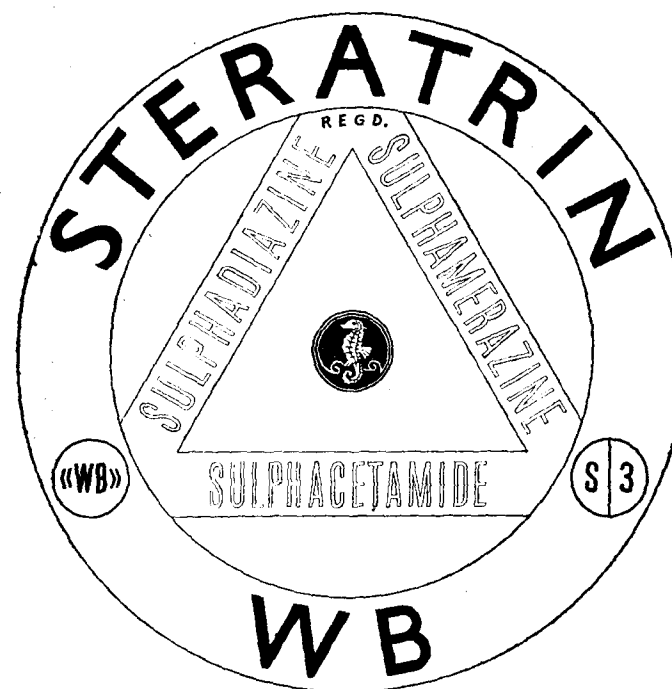
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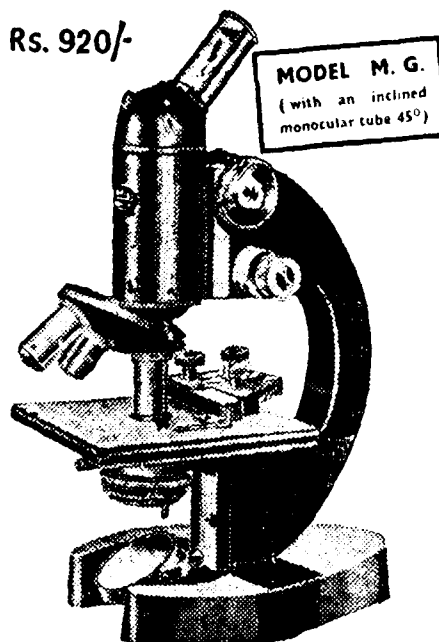
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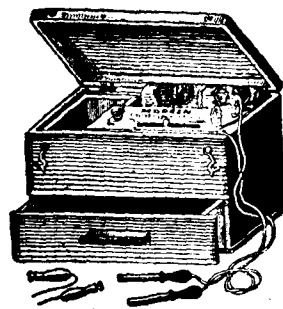
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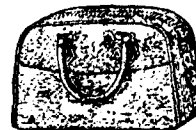
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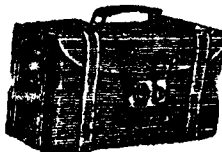
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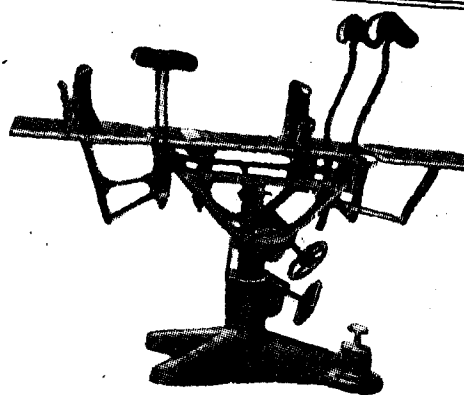
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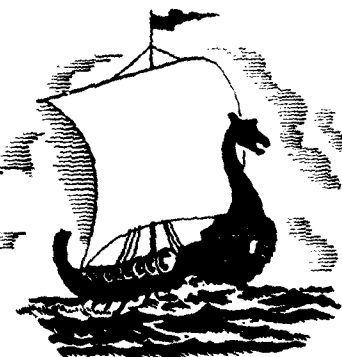
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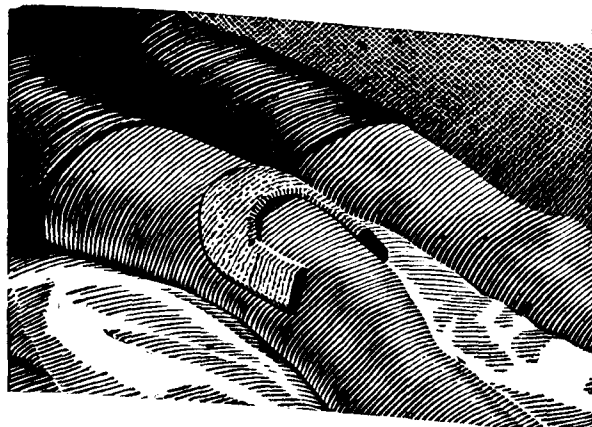
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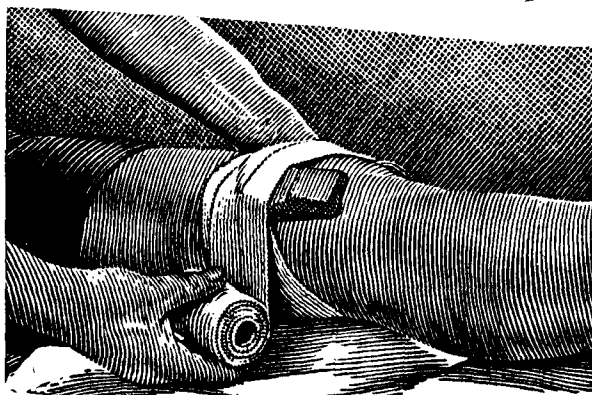
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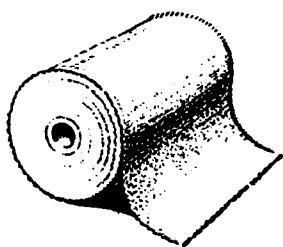
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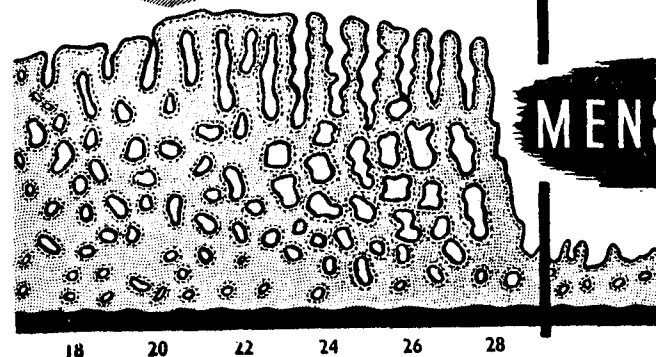
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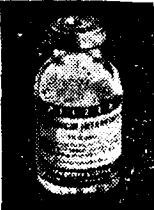
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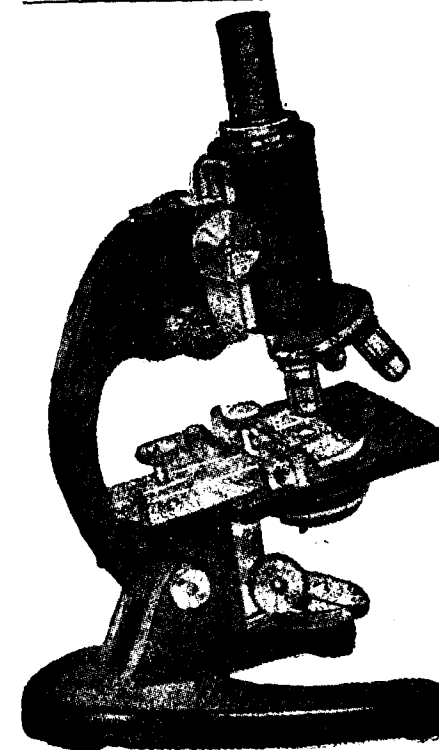
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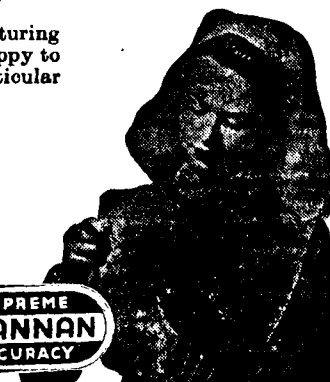
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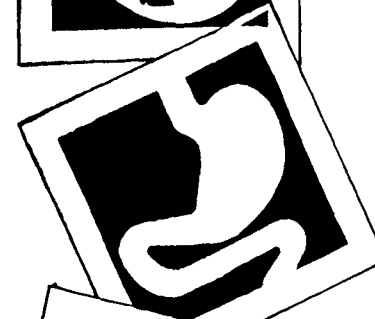


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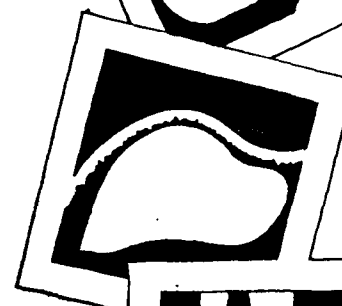
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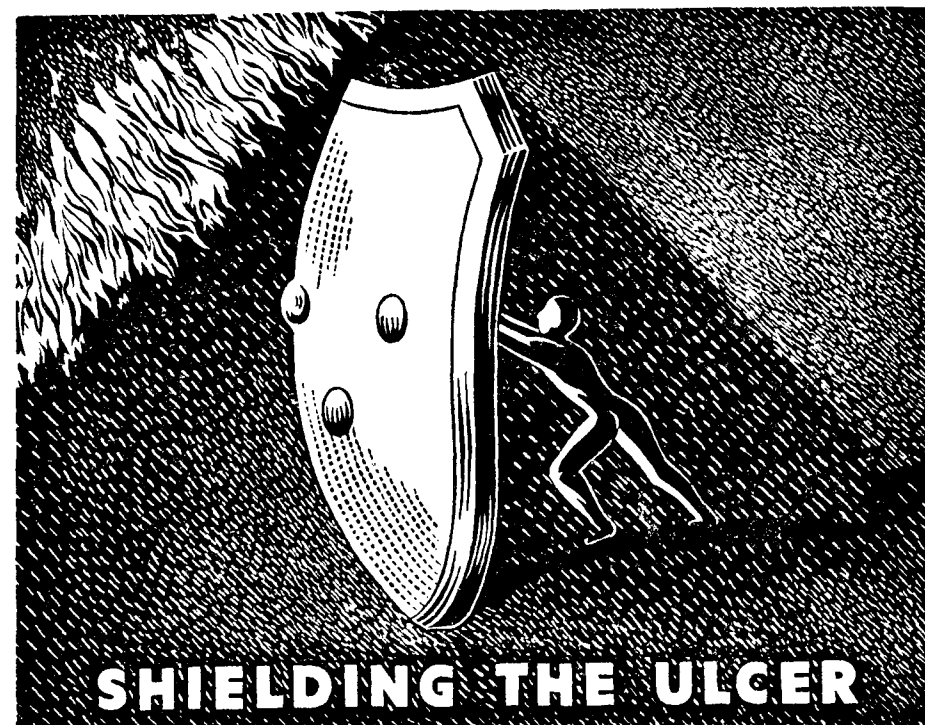
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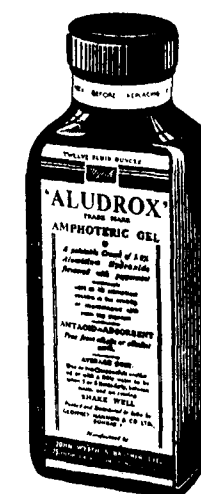
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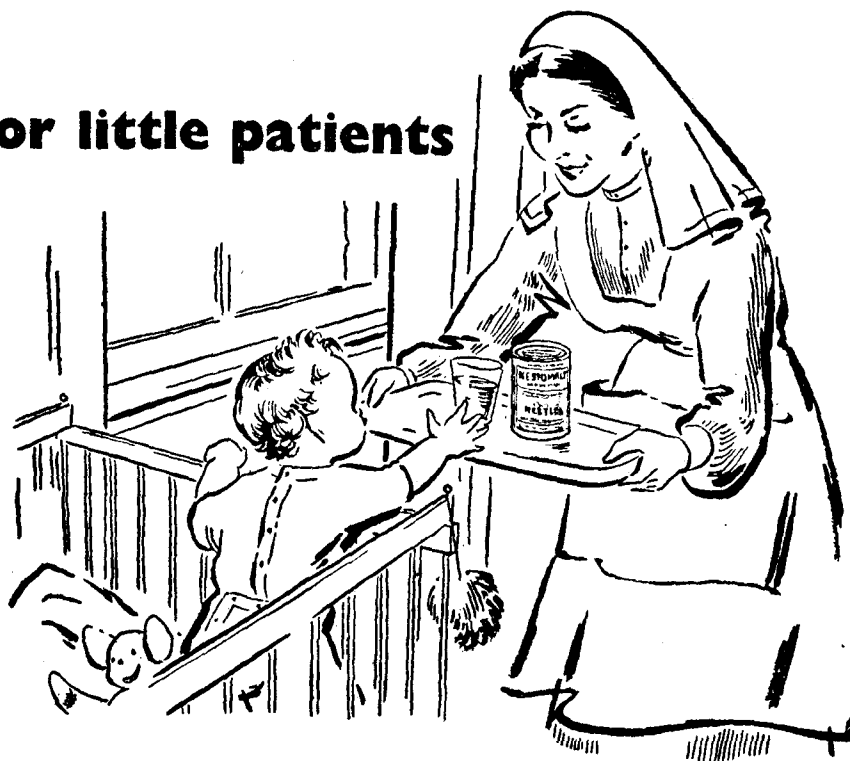
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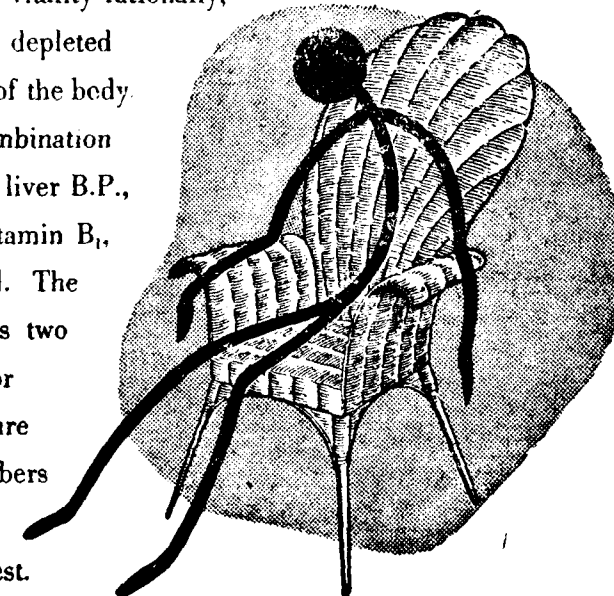
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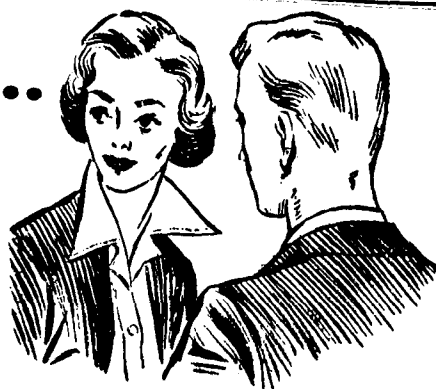
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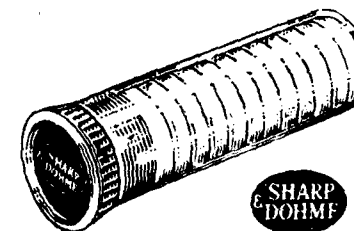
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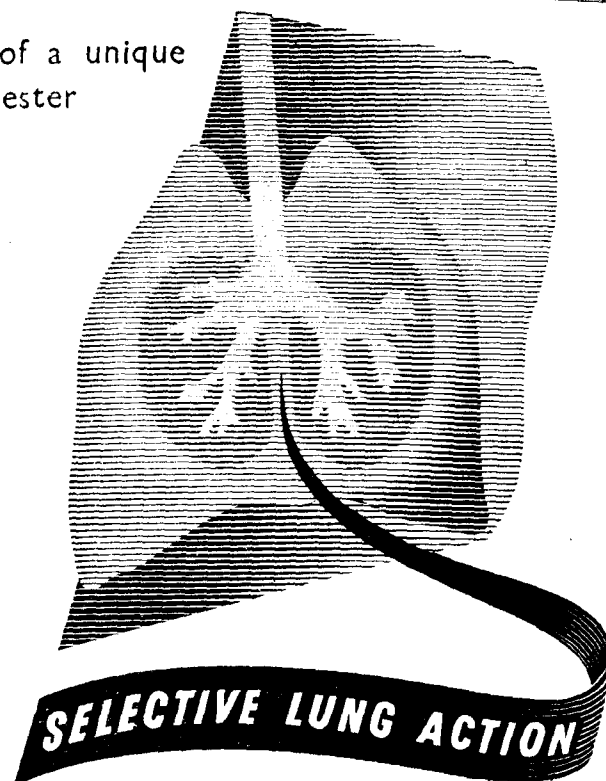


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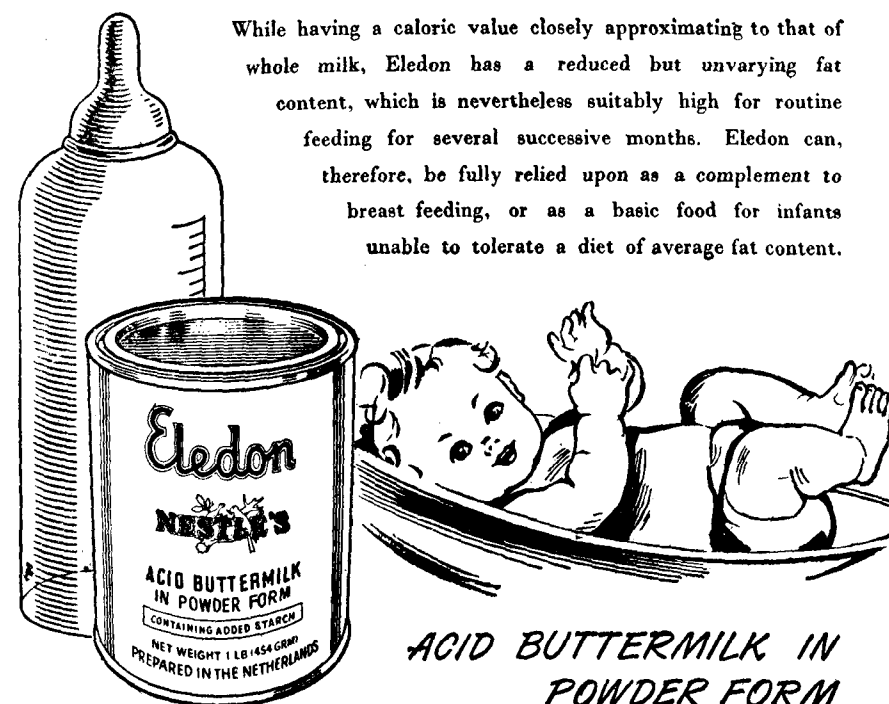
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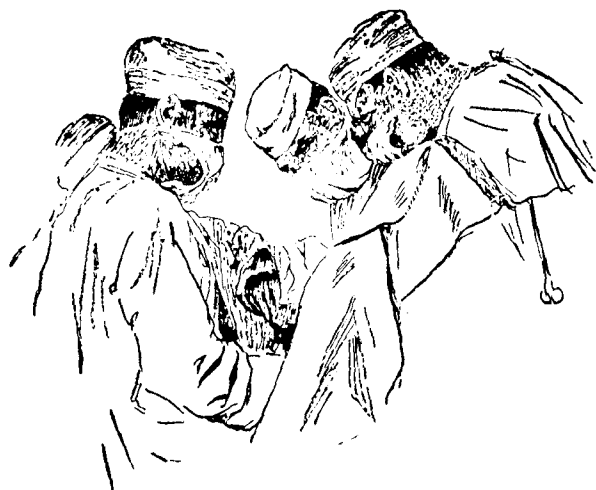
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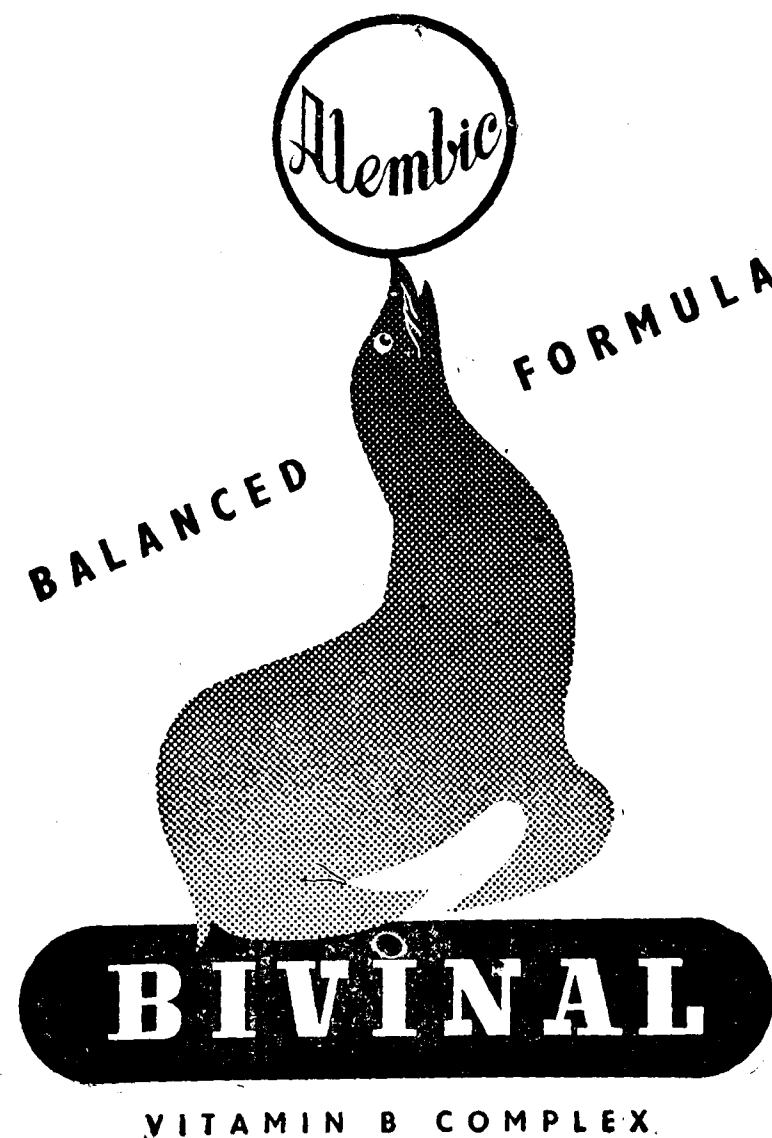
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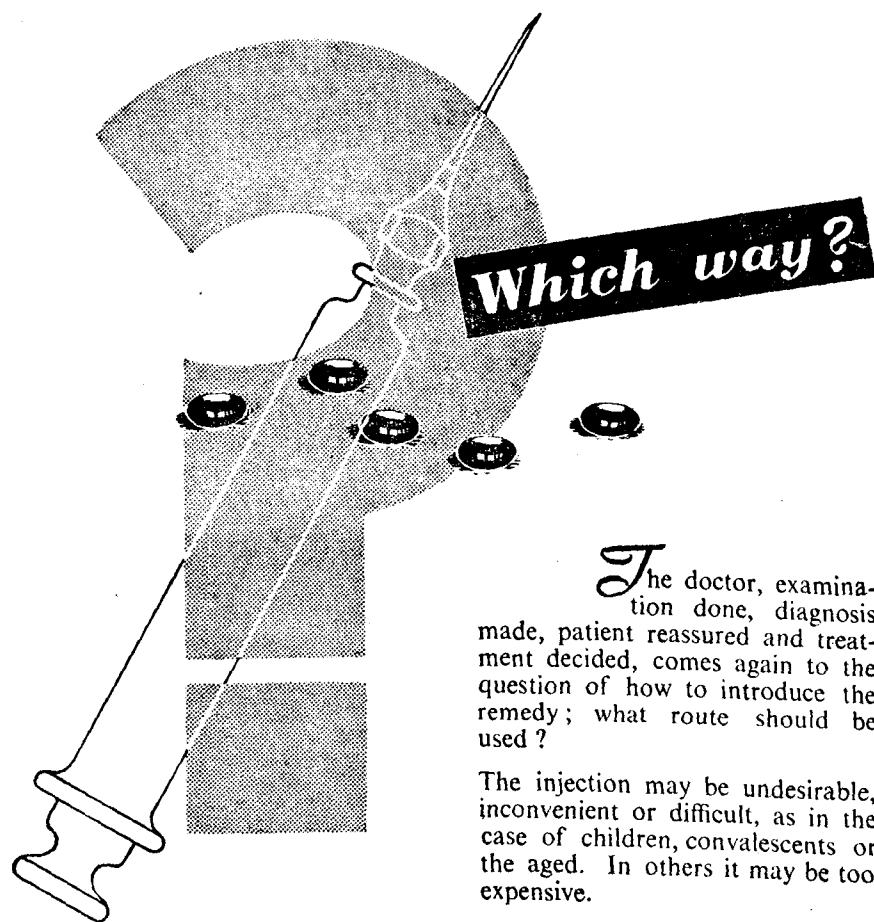
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Editorial & Publishing Office: 323-24, Thambu Chetty St., Madras-1.

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

Vol. 50

DECEMBER, 1953

Original Articles

DIAGNOSIS OF DYSURIA IN THE ELDERLY MALE*

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THOUGH etymologically the term *dysuria* is used in a comprehensive sense to include subjective disturbance of the normal act of micturition, several clinicians confine its use to indicate difficulty in micturition. I intend to use the word *dysuria* in this latter sense, here.

Causation.—The causes of difficult micturition may be divided primarily into two main groups:—

I. Organic obstructive causes *i.e.*, those due to some form of organic obstruction in the lower urinary tract and ;

II. Neurogenic causes *i.e.*, those due to some upsetting of the nervous influences responsible for normal contraction of the bladder musculature and relaxation of the vesical sphincters that take place during the act of micturition.

Group I—Organic obstructive causes.—In an overwhelming majority of cases of dysuria, the cause of difficult micturition lies in the existence of some obstructing condition in the lower urinary tract.

These may be:—**A.** Preputial causes. **B.** Urethral causes. **C.** Prostatic causes. **D.** Vesical and other causes.

* A paper presented before the Trichinopoly District Medical Association, 1952 and published with the kind permission of the Hon. Secretary.

A. PREPUTIAL CAUSES:—Phimosis, congenital or acquired is the main preputial cause.

Congenital phimosis:—I presume that it is part of normal psychology, not to associate congenital phimosis with old age. Though the congenital phimosis should have been present from birth, I am surprised at the number of elderly people who come up for urological consultation and whose symptoms are to a large extent due to a bad phimosis. These people have passed urine normally, have led a normal sex life and have begotten several children. Later in life, probably due to chronic irritation produced by the passage of mildly infected urine, the narrow preputial outlet becomes narrowed still further. This, perhaps in association with diminished contractile power of the musculature of the aged urinary bladder, leads to difficulty in micturition and in a few cases has gone on to acute retention of urine.

Acquired phimosis:—But there is another set of persons who suffer from what may be called acquired phimosis. In these cases, they have been able to retract the foreskin properly. A few, later in their life, get recurring multiple fissuring of the preputial orifice; these fissures heal and break down again, thus giving rise to progressive fibrosis and narrowing of the preputial orifice. In a few others, purulent discharge from inside the sac accompanies difficulty in retraction of the foreskin. The recurrent fissuring is due to diabetes mellitus and glycosuria and the purulent preputial discharge may be due to the same disease or may be due to a carcinomatous ulcer inside the preputial sac.

In either of these conditions, a diagnosis of venereal infection is made by the patient and the consequent feeling of guilt or false prestige or prudence, prevent him from resorting to professional advice. The disease progresses, till the narrowing of the preputial orifice or the obstruction of the external urinary meatus becomes so marked that urination becomes very difficult.

B. URETHRAL CAUSES:—A pin-hole external urinary meatus and a post-gonorrhoeal stricture of the urethra, are the two common causes.

Pin-hole meatus is never missed, as the patient himself volunteers a very long history of difficulty in micturition; but regarding post-gonorrhoeal strictures of the urethra, there is an erroneous clinical impression that they are not responsible for dysuria in the elderly male. Though this is true to a large extent, I must warn against failing to diagnose stricture in the elderly male, simply because he happens to be elderly. Post-gonorrhoeal strictures can occur several years after the original Neisserian infection, and age and grey hairs are certainly no disqualification for acquiring gonorrhoea.

C. PROSTATIC CAUSES:—This group overshadows all the others as the commonest cause of dysuria in the elderly. Besides benign enlargements of the lateral lobes of the prostate, besides

carcinoma of the prostate, there are *two other* prostatic conditions

regarding which sufficient emphasis needs to be laid again and again.

One of these conditions is where the *middle or median lobe of the prostate* alone is enlarged and projects almost entirely into the lumen of the bladder, causing obstruction to micturition. (Fig. 1).

In the other prostatic condition, there is a fibrous bar or band along the posterior margin of the internal vesical orifice; popularly called *median prostatic bar* (Fig. 2) this prevents easy and adequate emptying of the bladder. Both these conditions are missed because *rectal examination reveals very little enlargement of the prostate*, unlike in the other conditions like benign lateral

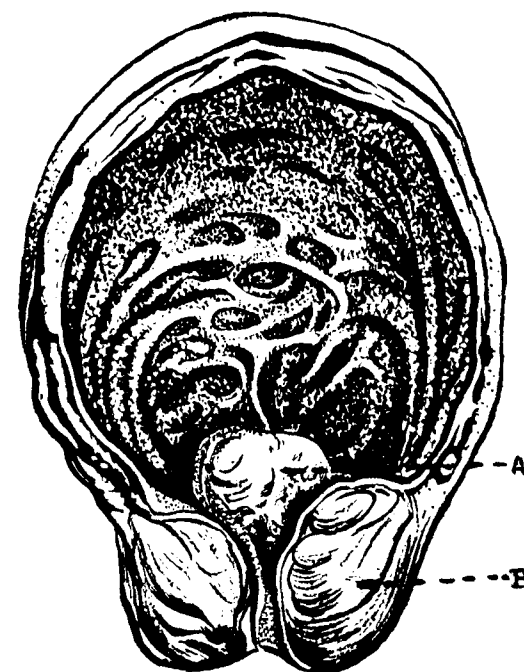


FIG. 1. Shows the urinary bladder and an enlargement of all the three lobes of the prostate. The lateral lobes are easily felt *per rectum*; the median lobe, with a purely intravesical projection, cannot be felt during a rectal examination.

A—Median lobe.
B—One of the lateral lobes.

lobe enlargements or in carcinoma of the prostate.

D. VESICAL AND OTHER CAUSES are very many. A high incidence in my experience has been stones in the urinary bladder or benign or malignant growths of the bladder. A few rare cases of diverticulum of the urinary bladder, or pressure from conditions outside the bladder for example, advanced

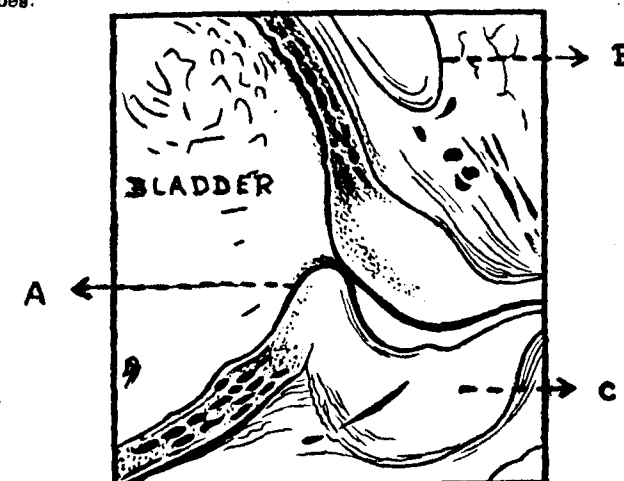


FIG. 2. Diagrammatic representation of the "median prostatic bar". Note that there is no prostatic enlargement and hence a rectal examination cannot diagnose this condition.

A—Median prostatic bar.
B—Symphysis pubis.
C—Prostate.

rectal carcinoma or pelvic growths have also been responsible for dysuria.

Group II—Neurogenic causes.—These are of 2 main types:

A. Those due to some organic neurological disorder where the actual innervations of the bladder and its sphincters have been interrupted as for example, in injuries to and tumours of the spinal cord.

B. Those of a reflex or hysterical nature, for example, inability to pass urine as when lying in bed in the post-operative period, or for example, difficulty in passing urine when there is an acute fissure-in-ano or when there is an acute inflammation in the perianal or ischio-rectal regions. This last condition is sometimes deceptive in the initial stages. The deep-seated inflammation gives rise to reflex, acute retention of urine. *The patient's main complaint will be about his tensely distended bladder.* Hence the perianal or perirectal suppuration is missed or its diagnosis and relief delayed unless these regions are specially examined and a rectal examination for any submucous bulge of an abscess is done.

These neurogenic causes are outside the scope of this paper. I shall briefly dismiss them by saying that in every case of dysuria, a careful neurological assessment combined with a thorough examination of the ano-rectal regions will be necessary for their satisfactory diagnosis and treatment.

Diagnosis of dysuria due to organic obstructive causes.—

A. HISTORY, PAST AND PRESENT:—Apart from giving a rough clue or pointer, history is not of very great importance, because of similarity of symptoms in various widely differing lesions.

History of an old and inadequately treated gonococcal urethritis or of a narrowed urinary stream from birth, or of a recently acquired phimosis are all self-indicative of the disease.

A history of dysuria along with frequency of micturition may indicate an enlargement of the prostate.

A history of dysuria along with a sudden cessation of the flow of urine during the act of micturition—sudden cessation associated also with severe pain along the urethra, suggests vesical calculus.

Recently, I had an elderly patient who had had six or seven attacks of left sided renal colic during the last two years. The last attack, he made me understand, was followed by severe pain and dysuria during micturition. He volunteered the information that the dysuria and pain and a co-existing frequency were worse during the day when he was walking about, than when he was recumbent at night. Diagnosis of a vesical calculus that must have recently reached the bladder from the left ureter, was easily made and later confirmed by an X-ray.

Dysuria with hæmaturia may be due to a prostatic enlargement or due to a growth in the bladder.

Dysuria and precipitancy may mean enlarged prostate.

B. GENERAL EXAMINATION OF THE PATIENT.—Though of very great importance in deciding the prognosis and the lines of treatment, this has not been very useful diagnostically. In the early stages there is no change in the general health of the patient. In the later stages all the above causes of dysuria have given rise to anæmia and evidences of frank or sub-clinical uræmia such as sleeplessness, thirst, loss of appetite and even emaciation.

C. LOCAL EXAMINATION OF THE ABDOMEN:—Besides a thorough examination of the entire abdomen, special attention to the suprapubic region is necessary to detect the presence of a distended urinary bladder. Apart from inspection, *palpation* for a tense mass in the hypogastric region and *percussion* for a dull area having the shape of the distended bladder are very necessary. *Even then in some very fat, obese individuals the distended bladder is likely to be missed.* In these a *bimanual palpation* with the fingers of one hand in the supra-pubic region pushing backwards and a gloved finger of the other hand in the rectum pushing forwards, will easily reveal a distended bladder.

At this juncture I would like to point out a not very rare occurrence namely, that a distended bladder can be just to one side of the middle line, placed obliquely, and not exactly in the middle line.

Examination carried out as above may reveal either:

- (1) A distended but almost painless bladder,
- (2) A distended and very painful bladder, or
- (3) No distension of the bladder at all.

1. *A distended but almost painless bladder* has generally been due to a chronic obstruction in the prostatic region. It is surprising how great can be the distension in these cases and how very little the pain. I recollect a case of an elderly lawyer who reported for dysuria last year. He had, as later investigations revealed, a median prostatic bar and 116 ozs. of urine stagnant in his bladder. The progressive protrusion of his abdomen which he had attributed to middle aged prosperity was due to a chronically distended and painless bladder!

2. *A distended and painful bladder* is usually due to an acute retention of urine or due to an acute attack superadded on top of a chronic retention; this may happen due to all the causes of dysuria mentioned hitherto and by itself does not help in diagnosing the cause of dysuria. The acute retention demands urgent relief.

3. *The absence of a distended bladder* is not of great diagnostic significance.

examination of his urine revealed a few R.B.C's and pus cells also, the patient was given some hormonal therapy and was advised a course of antibiotics.

When his symptoms did not improve even after six months, he was referred for a surgical opinion. Systemic and local examination did not reveal any cause for his dysuria; there was no enlargement of the prostate per rectum. Hence an X-ray of the bladder was taken (*Fig. 3*) and this revealed the cause for his symptoms—a vesical calculus. Removal of the calculus by lithotripsy completely relieved him of his two year old symptoms.

CASE 2:—Mr. S. A., an elderly advocate, started having dysuria and frequency. During the course of the next three months the dysuria progressively increased and went on to acute retention. An emergency suprapubic cystostomy was done to relieve the acute retention. Physical examination carried out at this stage revealed a very firm nodule in the left lobe of his prostate. As the diagnosis was not quite certain an X-ray (*Fig. 4*) of the vesical and prostatic regions was taken. This revealed no abnormality in the bladder or prostate but showed extensive bony secondary malignant deposits. The nodule in the prostate was obviously malignant and though small, this had given rise to extensive metastases.

CASE 3:—Mr. S. H., aged 74 years who had had frequency of micturition for nearly 28 months recently developed dysuria and also precipitancy of micturition. During the course of a routine examination a hard uniformly enlarged prostate could be felt per rectum; though the borders of this prostate and the median groove were intact the hardness was very suspicious of malignancy. An X-ray revealed a prostate with multiple calcifications in it. (*Fig. 5*) He had only a benign enlargement with calculi in the prostate, the calculi being responsible for the hardness that was felt in his prostate.

Thus an X-ray of the vesical and prostatic regions may reveal a vesical calculus responsible for dysuria or may help to diagnose the nature of a hard nodule in the prostate.

II. Intravenous pyelogram series.—With these, not only do we get an idea of the anatomy and physiology of the kidneys, but if an X-ray is taken after about 30-40 minutes we can see the dye accumulated in the urinary bladder and casting a shadow of the bladder—what is known as a *cystogram* (*Fig. 6*).

This cystogram will reveal the shape, size and regularity of the contours of the bladder. The residual urine, intravesical prostatic enlargements and/or the irregularities caused by bladder tumours can be made out.

A normal cystogram will show the smooth outline of the bladder wall, with no intravesical "filling defects". If an X-ray is taken after the patient has emptied his bladder completely by a normal

Diagnosis of Dysuria in the Elderly Male

U. Mohan Rau



FIG. 3. Vesical calculus.



FIG. 4 Shows extensive secondaries in the bones of the pelvis from a carcinoma of the prostate. Note: (i) The loss of the normal architecture (trabeculae etc.) of the pelvic bones especially the pubic bones, the left ilium and the left half of the sacrum; (ii) the dense osteosclerosis, seen so often in secondaries from a carcinoma of the prostate. (Compare with the bones in Fig. 5 below).

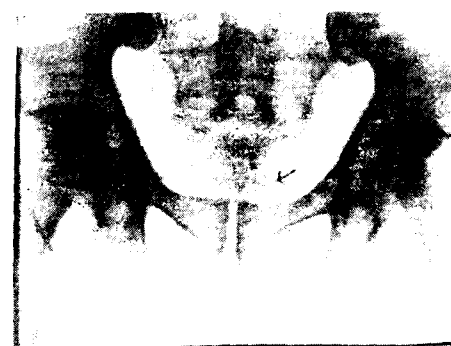


FIG. 5. Prostatic calculi. The arrow points to the region of the small multiple calculi.

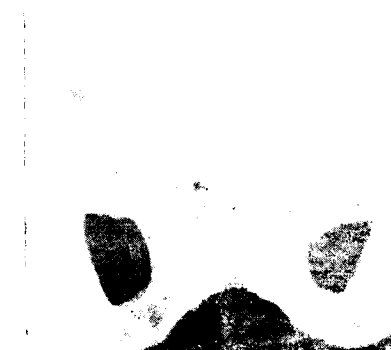


FIG. 6. Normal cystogram. The contours of the bladder are smooth; there are no "filling defects." [Vide page 848.]

Besides distension of the bladder, abdominal examination may reveal suprapubic tenderness in long standing cases of vesical calculi with cystitis, or in strictures of urethra with cystitis or in advanced cases of carcinoma of the bladder; this last condition gives rise to a suprapubic mass in the very late stages.

D. EXAMINATION OF THE GENITALIA may reveal any obvious phimosis due to recurrent recent fissuring; or it may reveal induration—an area of hardness—suggestive of carcinoma. Very rarely an anteriorly placed urethral stricture may be felt as an induration along the urethra on the under-aspect of the penile shaft.

E. URINARY STREAM AND THE ACT OF MICTURITION:—I make it a rule to persuade these patients with dysuria to pass urine in my presence. The obvious bulge of the preputial sac in a phimotic individual with dysuria is helpful. The patient may adopt a forwardly leaning attitude to pass urine; this is seen in some patients with prostatic causes of dysuria. If the last few drops of urine are blood stained and/or cause severe pain, it may mean a growth or a calculus in the bladder.

At this stage, after the patient has apparently emptied his bladder, I re-examine the hypo-gastric region and if this reveals a distended bladder, then it confirms the suspicion that the patient has a chronically distended bladder—a bladder that he has been able to empty only partially at each act of micturition.

F. RECTAL EXAMINATION:—This is done mainly for judging the size of the prostate and its nature. It is not safe to pronounce a final opinion on the clinical state of the prostate, unless the rectal examination is repeated after the patient has emptied his bladder completely. If, when the rectal examination is done, the bladder is distended, then I give only a provisional opinion, to be confirmed, modified or rejected later on, after a re-examination has been done when the bladder has been emptied. Neglect of this fundamental precaution has misled many a young clinician into diagnosing the existence of an enlarged prostate, when all the time he was feeling a distended bladder pushing the anterior anal and rectal wall before it.

It may not be out of place here to recapitulate the difference between a clinically benign and a clinically malignant prostate as felt per rectum. In a *benign enlargement* usually both the lobes are more or less symmetrically enlarged; the lobes are uniformly firm or soft in consistency; the median prostatic groove and also the borders on either side and above the prostate are all easily made out. On the other hand, a *carcinoma of the prostate* produces an asymmetrical enlargement of one lobe or of a portion of one lobe; this enlargement will be very firm, almost hard in consistency. Within a short time, one or more of the para-or median prostatic grooves get obliterated.

I would again emphasise here that median lobe projections and median prostatic bars cannot be felt per rectum.

G. URETHRAL CATHETERIZATION:—Having so far carried out a complete physical examination of the patient, the next logical step is to perform a urethral catheterization. I am now treading on very controversial grounds. There is a group of very eminent urologists who are against urethral catheterization for purposes of diagnosis and even for purposes of treating prostatic obstruction with retention. With due respect to them, I say that I am one of those who have catheterized and continue to catheterize the bladder through the urethra. The alleged dangers of traumatizing the urethral mucous membrane, the danger of introducing infection into the urinary bladder and the risk of uræmia being precipitated by a sudden decompression of the bladder are very greatly minimised if a new or a fairly new stiff rubber catheter, of a moderate size (I use No. 7 to 9 Eng.) is selected, is lubricated well (I use sterile olive oil or liquid paraffin in preference to glycerine) and is then introduced gently through the urethra, taking all possible aseptic precautions including a preliminary anterior urethral wash. *I never decompress i.e. empty the urinary bladder, completely*, if I find (i) that the patient has a distended but painless bladder and (ii) if I find that the urine as drawn out is foulsmelling and turbid. With these precautions, I have never regretted the passage of a urethral catheter for *diagnosing and treating dysuria*.

If a catheter goes in easily it rules out a narrowing of the urethra; the cause of obstruction is probably prostatic or vesical.

If the catheterization is done in this order i.e., after the patient has voluntarily emptied or says he has emptied his bladder, it also gives us an idea of the *residual urine* i.e., the amount of urine that is still left behind in the urinary bladder after the patient has voluntarily emptied it. *The commonest cause of residual urine in the bladder is a prostatic obstruction.*

Thus urethral catheterization by excluding narrowing of the urethra and by revealing the amount of residual urine helps in the diagnosis of dysuria.

ACCESSORY METHODS OF DIAGNOSIS:—I have so far dealt with methods of diagnosis that can be carried out anywhere, even in very remote corners of this great subcontinent of ours. I shall now deal with certain accessory methods of diagnosis.

I. "Plain" X-ray of the vesical and prostatic regions.—The usefulness of this is well demonstrated by the following three case reports.

CASE 1:—Mr. U., a retired jailor consulted his doctor for dysuria and frequency of nearly 18 months' duration. Because of his age and symptoms and without a rectal examination a diagnosis of benign enlargement of the prostate was made. As the

act of micturition, there will not be any residual urine (and hence any dye) in the bladder.

In intravesical prostatic enlargements there will be projections from the region of the trigone, seen as "filling defects" in the cystogram (Fig. 7). If an X-ray is taken after these patients have finished a normal (according to them a "complete" act of micturition), radiological evidence of residual urine may be seen. (Figs. 7 and 8).

Large amounts of residual urine with no obvious intravesical prostatic projection visible radiologically and no palpable enlargement of the prostate per rectum—these are generally seen in median prostatic bar formation with dysuria.

Irregular filling defects in the cystogram may suggest neoplasms as the cause of dysuria.

III. Retrograde cystograms.—Similar cystograms can also be obtained by introducing a radiopaque solution ("pyelosil" or an aqueous solution of sodium iodide 10%) into the urinary bladder by means of a per-urethral rubber catheter and then taking these pictures. The patient's urethra must permit catheterization for the procedure. Filling defects produced by prostatic enlargements (Fig. 9) or neoplasms or residual urine can be easily and economically estimated by this method. Careful precautions must be taken however to avoid the introduction of extraneous infection into the bladder.

IV. Cysto-urethroscopy.—The diagnosis of the cause of dysuria will be obvious by now in the large majority of cases. If however, there should still be any doubt, then recourse must be had to cysto-urethroscopy. A complete examination of the urethral, prostatic and vesical regions can be carried out only by this method. The craggy appearance of a vesical calculus, the fine finger-like projections of a papilloma, the rounded projections of an enlarged median or lateral prostatic lobe, the irregular ulceration of a carcinoma can all be easily recognised to enable a diagnosis to be made with certainty.

In this paper, I have not referred to other methods like (a) examination of the prostatic smear obtained by massage; (b) biopsy of a prostatic nodule; and (c) estimation of serum acid phosphatase, as these were neither easy nor economical to carry out in my limited experience.

Summary.—1. The common causes of dysuria in the elderly male are mentioned.

2. Clinical and simple radiological methods of diagnosing dysuria are discussed.

Fig. 7. Cystogram from a case of enlarged prostate after the patient has voluntarily emptied the bladder "completely." Note that (i) there is a good amount of residual urine in the bladder and (ii) the "filling defect" in the region of the neck of the bladder. This was produced by an enlarged prostate shown in Fig. 8.



Fig. 8. The enlarged prostate (all the three lobes) removed from the patient, whose cystogram is shown in Fig. 7.



Fig. 9. Retrograde cystogram—shows the intravesical projection of an enlarged prostate.



CLIMACTERIC MOODS AND THEIR MANAGEMENT*

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BITTER lessons learnt from long medical practice, when text-books of medicine offered no avenues of approach, much less solutions, of the knotty problems connected with menopausal moods, which by virtue of their long-drawn-out character, had made the woman herself forget what her normal pitch of feeling used to be, (thus putting the doctor completely off his guard) impel me to write this article, solely for the benefit of the general practitioner. Since it is the general practitioner, who alone has the opportunity to reverse while yet there is time, what I call the 'negative state balance' of the afflicted woman, it is only right that he studies this aspect more closely, thereby offering genuine help and welcome relief to the disturbed woman whose affliction has come to the surface at the climacteric, but unfortunately failed to arouse interest. Too often the diagnosis of these unfortunate women is relegated to the scrap heap of hysteria, neurosis, or functional fury. When the patient has exhausted herself by self-control, she comes to the doctor with the initial complaint of insomnia and exhaustion. The doctor, therefore, must familiarise himself with the following multiple symptoms attributable to the "negative state balance". He has also to remember that it is not necessary for the symptoms to synchronise with the menopause, because I have seen symptoms of vertigo developing even 10 years after the cessation of menses. As I have always said "to remember is not to forget."

The set symptoms resulting for hypogonadal syndrome at climacteric are common, and even then it is surprising how we all went round and round treating such cases with vitamin B₁, vitamin C, anthisan, liver injections etc. etc., without offering any immediate and permanent relief to the patient. I propose in this article to discuss this and other related conditions. I shall first deal with the set symptoms.

A. In the female.—Ovarian hypofunction reveals itself as:—

I. Primary e.g., eunuchoidism.

II. Secondary e.g., (a) Pelvic inflammations, like salpingitis, appendicitis etc. These cause degeneration in the glands; (b) constitutional disease processes like anæmias, tuberculosis, malignancies etc., (c) vitamin deficiencies in diet; and (d) anterior lobe pituitary deficiency like infantilism; pre-adult-Froehlich's syndrome etc.

III. Evolutionary:—(a) Post-operative; and (b) climacteric.

We are here concerned only with the last viz., III (b) climacteric.

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SYMPTOMATOLOGY:—This consists of certain signs and symptoms.

1. SIGNS:—These signify changes which are a reversal of those that occur at puberty:—(a) Menorrhagia and metorrhagia mark a "natural evolution menopause", but menstrual disorders, alone or together, like irregularity, scantiness, and finally amenorrhœa, occur in a younger person; (b) tendency to obesity of gonadal type viz., over the trochanters, mons veneris, and breasts; and (c) atrophy of internal and external genitals, and loss of pubic and axillary hair.

Vulval atrophy affects the labia majora with exposure of labia minora. The vestibule becomes shrunken and dry, with tendency for kraurosis vulvæ. The vagina becomes pale and may shrink at its orifice and vault. Glycogen disappears from the vaginal epithelium due to withdrawal of oestrogen from the blood; Döderlein's acid forming bacilli disappear, so the vaginal secretion becomes alkaline. There is a lowered resistance to vaginal infection and tendency to senile vaginitis. The uterine muscle gets replaced by fibrous tissue and the uterus shrinks in size. The cervix also shrinks and the canal becomes occluded. Thus the uterine secretions can get dammed back and Pyometra may follow. Under the changing and ill-balanced hormone influence, (what I call 'disturbed hormonal ratio') the endometrium becomes thin and atrophic. There may occur irregular growth patterns; also a predisposition to glandulo-cystic hyperplasia causes symptoms of metropathia hæmorrhagica and even cancer of the body of the uterus. The ovaries may become small and atrophic and their endocrine and reproductive functions cease.

Lack of oestrogen in the blood, results in the removal of inhibition of the anterior pituitary secretion, which is normally restrained by the ovarian hormone, with consequent headaches of interior pituitary overaction. Prolan A (F.S.H.) and Prolan B (L.H.) may be produced in increased quantities, but the ovaries no longer respond to their stimulation.

A.C.T.H. stimulates the adrenals to increased secretion with suppression of ovarian activity and amenorrhœa. The skin becomes dull and dry, fat is laid down in the subcutaneous tissues and B.P. may rise.

Diabetogenic hormone may depress the interstitial cells of the pancreas and cause lowered CHO tolerance.

Thyrotropic hormone may cause thyroid overactivity with palpitation, nervous instability, and vaso-motor disturbances.

2. SYMPTOMS:—These constitute the most disturbing feature and may be classified under the following heads:—

(1) *Nervous*:—(a) Tension:—Feelings inside of jumpiness, trembling, like screaming as though they might become mental;

(b) Headaches :—Dull to severe, but not neuralgic. Occipito-cervical variety radiating to the nape of the neck, even over the scapulæ, or down the spine, is pathognomic; (c) Excitability :—Any little occurrence which would not disturb a normal individual, will cause a nervous and mental flurry—an exaggerated psychic response; (d) Irritability :—Easily excited to anger, hard to please, in fact hard to get on with; (e) Sleep disturbances :—Poor sleep of various kinds e.g. sleep of short intervals; sleep of difficult onset (keeping her awake till 2 to 3 a.m.); quick sleep but long hours of morning awaking—are all complained of; (f) Bouts of psychic depression i.e. "blues". They cry for no reason, worry that something dreadful will happen to them or their loved ones, and even persecutory delusions form a feature; (g) Memory disturbances :—Slow cerebration, slow grasp, forgetfulness, and inability to concentrate—are all encountered; (h) Formications, as if insects are crawling, pricking and tingling sensations.

(2) *Circulatory* :—(a) Hot flushes with sudden redness of the face, neck, upper chest, is a very uncomfortable sensation. It may be accompanied by vertigo, scotomata, tingling or pricking; (b) Tachycardia, dyspnoea and easy fatigability due to generalised decrease in vascular and muscular tonus. Any moderate effort causes more fatigue than can be accounted for otherwise. Patients usually say that they are more tired on rising from bed in the morning than what they felt on going to bed the previous night. These symptoms also follow infectious diseases, toxæmias, but in the hypogonadal syndrome no organic disease is discovered; (c) Postural vertigo, tinnitus, and scotomata are other annoying symptoms without evident cardiovascular or other causative lesions; (d) Cold hands and feet are common accompaniments of the hypofunction of not only the ovaries but also pituitary, thyroid, and adrenal glands; (e) Like (d), the pulse is soft and low tension, while B.P. is low.

(3) *General symptoms* :—(a) Lassitude, fatigability, constipation, and gastric syndromes (distention and post-prandial eructations) should be borne in mind, but due attention should be paid to diet, proper habits and gastro-intestinal pathology; (b) Vague pains, commonly a boring ache along the spine, in the legs, præcordial and in the abdomen, should be remembered; and (c) Rheumatic pains.

Climacteric in a woman usually coincides with the cessation of menstrual flow at menopause and therefore, this is the only objective phenomenon which attracts attention. It should be borne in mind that menopausal symptomatology is not limited only to an insufficiency of the ovaries, but it is a result of a complex endocrine crisis as a whole. There occurs an imbalance in other inter-related glands with secondary disturbances of the delicate equilibrium between the two divisions of the autonomic nervous system, manifesting in the production of the above subjective symptoms. Further it should be remembered that each individual reacts

differently, depending on his or her original mental and physical make-up; and on the process of cessation of menses, allowing time for the re-adjustment of the glands, (in response to the needs of the body) i.e., quicker or more gradual onset.

It is generally argued that obesity is a result of hypothyroidism or thyroid lag as it is commonly called and explained as follows :—There is less internal secretion of the thyroid viz., thyroxin, which contains 65% of iodine. This slows the vital processes of the body because less oxidation takes place and the metabolism is decreased. The result is deposition of fat—a subdermal mucoid infiltration, giving the appearance of an oedema, which does not pit on pressure. This myxedematous infiltration may internally manifest itself in slow cerebration and mental depression, decreased muscular tonus and fatiguability, insufficient sympathetic innervation, and therefore vagotonia. The pulse is slow, extremities cold, skin dry, bowels constipated, and memory poor.

In short, there is instability of the autonomic nervous system. It is easy enough to diagnose ovarian disturbance when the same occurs round about 40 years of age or is associated with menstrual disorders or is in the castrates. But if it occurs before time, or without menstrual disorder, lest these patients be labelled neurasthenic and get buffeted about, we should remember that the whole climacteric syndrome is unpredictable and often disguised. No regular order exists. Subjective symptoms may come first and be finished before flushes and amenorrhœa appear or the order may be reversed. Most difficult cases are those whose only complaint is change in the mood i.e. depression, irritability, fatigue or exhaustion. Afraid of being condemned and under the tacit assumption that change of life signifies a suffering, these moods insinuate themselves in such a subtle manner that the woman herself can give little or no history of their first appearances. She remembers her normal state of feeling only after treatment, when she herself gets surprised. No wonder these cases are difficult to diagnose and are an impressive monument of suffering. I shall now discuss the changes of mood in greater detail.

I. Menopausal depression.—This is an important symptom the "negative state." A woman who has been well-balanced is not willing to mention her "low spirits" to her doctor. When she consults her doctor, it is for something else. The following case history illustrates the above points.

CASE 1.—A multipara, aged 45 years, known to me for her jovial nature and loud outbursts of laughter, walked into my consulting room with the complaint of bouts of burning episodes. She said, "I get sudden electric shocks—then sensations as if I am being roasted alive." These sensations last a few minutes, some times as long as half an hour, and occur with a frequency of

3 to 7 times in 24 hours." Injections of Vitamin B₁ had not relieved her, Vitamin C 500 mg. with anthisan had given some relief, while syntovex (dumax) oestrogenic hormone 0.5 mg. by I.M. injection had aggravated her symptoms. When I made further enquiries she mentioned about flushes and low spirits, vertigo, headaches and irregularity of menses. She was put on stilboestrophil (O.P.I. Ltd.) 0.05 mg. t.i.d. then 0.1 mg. t.i.d. with remarkable effect. She stopped treatment after a month and relapse occurred in a milder form. She herself recommenced the treatment, and obtained relief from 0.2 mg. t.i.d.

II. Menopausal irritability.—This is characteristic of a mood, which can hardly be concealed, and which indeed becomes trying for everybody at home and outside. The mistress of the house becomes intolerable, the teacher aggressive, the shop assistant cross with customers, and the nurse short-tempered. And it is for this reason that in the West, women under 35 years of age are preferred for employment. Sensitivity and inadequacy creep in; much guilt and paranoid feelings are apt to develop, if prolonged attacks of irritability are not promptly relieved by oestrogen therapy. Paranoid tendencies exist in all of us, but in allowing these habits of mind to establish themselves, by omitting to treat such cases promptly, we run 'irreversible' risks. I recall with great pain my lapse in having omitted to treat a case of this kind many years ago who was subsequently so diagnosed, and treated with oestrogens in England. But then, it was too late. These are the hard facts of medical life which I wish the general practitioner to bear in mind. 'Negative state balance' is capable of precipitating mental states, which normally bear no relationship to the normal personality of a particular individual. Hormonal swings can work havoc with the patients' personality.

III. Menopausal exhaustion.—Exhaustion—mental or physical in a middle aged woman, should always raise the possibility of oestrogen or thyroid insufficiency. Bodily fatigue appearing early in the morning as lethargy, with menorrhagia, and presence of a few of the common signs of subclinical hypothyroidism enumerated on page 852 will, in all probability yield to thyroid medication.

Nervous fatigue, loss of memory, inability to concentrate and a funny feeling in the head should receive oestrogen therapy. Liver, iron and rest may do temporary good, but oestrone therapy is specific. The following case history will illustrate the above points:—

A multipara aged 42, on whom hysterectomy was performed in a nursing home in Bombay and to whom post-operative oestrogen therapy was not given, showed signs of exhaustion. She was given 12 injections of liver and other supporting therapy with temporary benefit. These injections were repeated but she gradually developed mental depression, rheumatic pains and vertigo.

She consulted me 3 years after the operation. She was put on a combination of oestrogens and progesterone with great relief. It may be mentioned here that most predictable climacteric events occur after hysterectomy in a case, in which menopause has not commenced. The obvious reason for this is because even if the ovaries are left, some disturbances of blood supply take place and the activity of the ovaries regresses. The younger the patient, the worse are the symptoms and the more rapid and critical are the events, if the ovaries are simultaneously removed. The surgeon must bear this in mind. If he has the welfare of his patient at heart he should not forget to prescribe post-operative oestrogen therapy.

The ovarian principles.—*Natural oestrogens*:—The oestrogen actually produced by the ovary, was isolated from follicular fluid by Doisy *et al* (1936). It was called oestradiol. It was also prepared chemically from oestrone. These two naturally-occurring oestrogens *viz.*, oestrone and oestradiol, being chemically pure compounds, are expressed in terms of weight, rather than as units. Since both these substances are destroyed rapidly in the body (Zondek 1934), injections had to be given at frequent intervals. Their oestrification was, however, successfully attempted, which not only markedly delayed the absorption, but also made oral administration possible. Thus then did Ethynol oestradiol come into being. (Inhoffen *et al*, 1938).

Then dawned a new era of synthetic oestrogens, which were as active by mouth as by injections and in January 1939 we welcomed with thrill, stilboestrol, (Bishop *et al* 1939), which is said to have 20 times the strength of oestrone. Its cheapness and oral efficacy brought it at once into wide-spread use. Hexoestrol, a hydrogenated form of stilboestrol with equivalent activity but less toxicity (Bishop *et al* 1940), and Dienestrol, a strong lactation-suppressing form of stilboestrol (Barnes 1942), were two other synthetic oestrogens pressed into the service of humanity.

Dosage:—Since the symptoms which trouble the patient usually last for some months or even up to two years, the treatment of the menopausal syndrome consists in the administration of decreasing amounts of oestrogens over a period of one year (depending upon the individual). Doses vary from 0.25 mg. to 1 mg. of the oester (oestradiol benzoate) injected once a week, or 0.1 to 5 mg. stilboestrol given daily by mouth. These dosages are the higher limits and it is better to start with lower doses and increase gradually till the symptoms are suppressed, because synthetic oestrogens produce nausea and vomiting when given in too high a dose. With increased experience, I have come to use smaller doses, seldom more than 1 mg. of oestrone daily. After menstruation has stopped, anything between 0.2 to 0.6 mg. would suffice. In the case quoted above, 0.15 mg. made a great difference. Stilboestrol is toxic to about 20%

of women and particularly so to the elderly ones. Excessive doses, as advertised by the makers, have already biased many general practitioners against using oestrogen therapy at all, because irregular uterine bleeding in the middle-aged women has resulted. Oestrogens may be combined with small doses of thyroid, in suitable and properly selected cases and when the dose of oestrogen is gradually decreased and finally stopped, thyroid may be continued. Glucose in cases of 'exhaustion', valerian and phenobarbitone in 'anxiety' cases, are time-honoured remedies. Hormone therapy should not be continued in any case, for longer than 3 months without supervision. Thus, the dose is gradually decreased and when finally discontinued, symptoms do not recur. Before closing the discussion of this part, it will be worthwhile clearing some points of doubt which are often raised, which is best done in the form of questions and answers.

1. Q. Does the administration of oestrogens prolong the duration of menopause?

A. The whole process of natural climacteric may last for several years and it is difficult to state whether the duration is affected by oestrogen treatment. However, the symptoms which trouble the patient, last for some months, up to two years, and the administration of oestrogens certainly help in this direction.

2. Q. If oestrogens are given in too large doses, is the endocrine imbalance between the anterior pituitary and ovary affected and the symptomatic phase prolonged?

A. Larger doses render the patient insensitive, making it necessary to administer still larger doses. It is, for this reason, that a low dosage is recommended and given intermittently, so that a prolongation of instability does not occur. It may however, be mentioned that sometimes flushes reappear, showing that the anterior pituitary activity is still present; or again it may be an exaggerated psychological response of the patient, which is overcome by reassurance and by the use of phenobarbitone.

3. Q. Has any harm resulted from long continued administration?

A. The sensitivity of the uterus varies considerably and oestrogens may produce post-partum bleeding, which raises a fear of cancer and the necessity for curettage. Therefore, patients with hyperplasia of the endometrium and with endometriosis, should not be given oestrogens, because the activity of both these conditions depends upon oestrogens. The combinations are helpful in such cases, *vide infra* page 858.

4. Q. Do oestrogens induce carcinoma in human beings?

A. There is no positive evidence, but (a) if the liver fails to inactivate oestrogens, carcinoma of cervix is more likely to occur; (b) it has been found that carcinoma of the body of the uterus is

higher in patients who had a preceding endometrial hyperplasia; (c) larger doses of oestrogens can cause inhibition of pituitary activity; and (d) irregular bleeding (sometimes profuse) and water-retention, on a prolonged course of high doses of oestrogens have occurred. It may therefore, be emphasised that *with a low dosage, as recommended above, there should be no fear whatsoever of any adverse effects.*

B. In the male.—Many men, if not all, pass through a climacteric period, somewhat similar to that in women, though less severe but more prolonged. Whereas this endocrine dysfunction *plus* autonomic nervous imbalance in women carry demonstrable evidence of menstrual decline, in man this decline in sex-function coincides with the beginning of a decline in potency and libido. It occurs later in men, round about 50 years of age.

SYMPTOMS:—The climacteric symptoms in men may be classified as in women:—nervous, circulatory and general in distribution. Symptoms which are mental and psychic *i.e.*, irritability, changes in mood, decrease of memory and power of concentration, loss of interest, restlessness and depression are usually more constant than neuro-circulatory symptoms like hot flushes, suddenly increased perspiration, chilly sensations, vertigo, scotomatas, palpitations, numbness and tingling. They occur at irregular intervals with periods of freedom. It is possible that some cases of involutional psychosis and unexplained suicides may well have occurred in such patients.

PHYSICAL SIGNS:—These are chiefly evidenced in the urogenital system. There may be hypertrophic changes in the prostate and seminal vesicles, with accumulation of residual urine in advanced cases. There is also weakness of the bladder muscles leading to frequency and urgency of micturition, especially at nights. These are the symptoms and signs which rapidly disappear on the institution of correct androgen *cum* oestrogen therapy.

DIAGNOSIS:—In 1944, Heller and Myers, showed that gonadotrophic hormone secreted in the urine of male climacterics was ten times higher than in normal individuals. They also showed that decrease in these levels occurred with successful therapy. This laboratory test is of significant value in the diagnosis of doubtful cases and is of considerable practical significance in the cured cases.

TREATMENT:—*Testicular principles—androgens*:—Androsterone (present in the urine of normal males), and more active testosterone (isolated from the bull's testis) are the two more common ones used. Testosterone is also produced synthetically. As with oestrogens, so with testosterone, the esters are more slowly absorbed and testosterone propionate is the most common ester used in clinical practice. Another point to note is that testosterone propionate is as effective when given orally, as when given intramuscularly. Perlingual application and implantation are other routes of administration.

Dose:—The dosage varies from case to case, but I give 25 to 100 mg. every alternate day by intramuscular injections. When the symptoms are suppressed, oral therapy is resorted to. It may be mentioned that as a side-effect (during androgen treatment) there is an increase in the body-weight and muscular development, because retention of nitrogen occurs. While I was a Civil Surgeon in the Madras State, I practised implantation, details of which are given below:—

Before implantation, a course of 10 or 12 injections of 1500 units of gonadotropic hormone (Pregnyl) two to three times a week was given to prevent the inhibiting effect of testosterone on spermatogenesis and interstitial cells of the testes. At the end of this course, implantation was made with a special trocar and canula under local anæsthesia and strict aseptic conditions, deep into the fat of the abdominal wall.

The implant consisted of six fused pellets of 200 mg. each of testosterone and one pellet of 10 mg. œstradiol, so spaced, that each pellet was about half an inch away from the adjoining one. Treatment with mixed hormones was based on the findings of Korenchevsky (1935) and others who had stressed that a balanced mixture of both the sex-hormones was responsible for the normal development and functioning of both males and females. This procedure has now been rationalised by the findings of Maddock and Nelson (1952) who have shown that Leydig cells produce large amounts of œstrogen.

The results of implantation used to establish themselves after about a fortnight and would last for about six months. The pellets did not cause any inflammation, while the general improvement, tantamount to a cure, was quite significant.

It is worthwhile mentioning here a word about its use in women. Because it prevents progestational changes in the endometrium, its use in menopausal menorrhagia is rationally sound. However, androgens in women should be used with caution because (i) œstrogens are quite effective; and (ii) with androgens there is a chance that masculinising effects may develop, which regress only rather slowly after the cessation of androgen therapy.

Before concluding, I would like to emphasise certain points:—The climacteric moods have their origin in an endocrine imbalance. These disorders do not seem to have the same hormonal pattern. Some ratio seems to operate between certain hormones, which appears to depend on the balance of œstrogen with progesterone and joint balance with adrenal cortex hormones and gonadotropic hormones of the pituitary (Karamchandani, 1952).

Progesterone in the form of ethisterone and androgens as methyl-testosterone, both sublingually, meet the requirements when indicated.

The negative behaviour of menopausal women is *pathognomic* of their condition, and furnishes an important clue to treatment.

œstrone is the sheet anchor of treatment for menopausal disorders. But occasionally, when a patient responds badly, ethisterone or androgen sets right the symptoms by restoring the proper hormonal ratio. The use of androgens is harmless, provided the limitations as to dosage are taken well into account. A total of 250 mg. per month, should be the ceiling dose and the treatment should be intermittent. Androgens prove invaluable in disturbances complicated by fibroids or functional menorrhagia. The moods abate, the hæmorrhage is controlled and fibroids regress.

In affective mental disturbances with menorrhagia, a balanced combination of ethinyl œstradiol and methyl-testosterone alternating with œstrone, prevent full development of psychotic states other than schizoid.

If the disturbing moods are not treated promptly, *i.e.* when the case is still reversible, a stage is reached when the patient feels differently about herself and her environments and the people around her have likewise changed their attitude towards her, and the case becomes 'irreversible'. Then a prolonged, perhaps, incurable illness sets in, which could have been prevented by hormonal treatment instituted in good time.

Summary.—1. The female and male climacteric is a well defined condition affecting women and men, round about the ages of 40 and 50 years respectively.

2. The disturbances depend on a changed ratio between hormones. The hypothetical change in the ratio is termed "negative-state-balance".

3. Treatment should start with œstrogens in the female in small doses, and in some cases with very small doses of œstrogens, androgens or progesterone after the menopausal moods *i.e.* a combination which tilts the balance in a new direction.

Androgens should be given to the male in larger doses. Improvement in these conditions is spectacular, provided the case has not reached the "irreversible stage".

4. Disturbances of mood may lead to involutional melancholia, and hence the importance of early treatment of such cases is stressed.

5. Where possible, implantation therapy with androgens should be given because, it rids the patient of his trouble at one stroke.

It would be the method of choice, where suitable facilities exist. Extrusion of crystals caused by infection or intolerance is rare with testosterone.

6. The *pros and cons* of androgen *plus* oestrogen therapy are discussed.

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An Endocrine Factor in Certain Affective Disorders

Dr. Joan Malleson of the University College Hospital, London, writing in the *Lancet* for July 25, 1953, offers the thesis that several affective disorders of women have a common factor, that of a physiological disturbance of hormonal balance which acts only just outside the range of normal endocrine fluctuation. She suggests that premenstrual tension, menopausal discomfort, and sometimes pregnancy sickness and puerperal depression, are related, and that some cases of involutional and puerperal melancholia are really extensions of these earlier affective disorders. Although these more severe disorders are no longer accessible to direct endocrine therapy, there may be an endocrine "trigger" factor involved. The mood changes contingent upon hormonal changes are essentially negative and readjustment of the hormonal balance will almost always bring relief. It is postulated that the disorders are induced not necessarily by the same hormonal pattern, but by the incidence of some special ratio between certain hormones. This ratio appears to depend upon the balance of oestrogen with progesterone and probably upon their joint balance with the hormones of the adrenal cortex and with the gonadotropic hormones of the pituitary. It is probable that this imbalance is just outside the range of normal, since comfort can be restored with very small endocrine doses.

This hypothetical change of ratio is described as a "negative state balance" and its different aspects as seen in premenstrual tension, menopausal discomfort, including depression, exhaustion, irritability masochism, involutional melancholia, and disorders of childbearing, have been discussed and in treating these disorders, Dr. Joan Malleson has found very small doses of oestrogens, androgens, or progesterone to be effective in any combination, which tilts the balance in a new direction. She also stresses the importance of giving only small doses.

The study of this problem by endocrinologists will be valuable, but it is rare for either an endocrinologist or a psychiatrist to be consulted for the minor symptoms discussed here. By the time these problems reach a psychiatric department, it is often too late to consider them from an endocrine aspect; the long duration of the disturbing moods has distorted the patient's feelings about herself and her environment. These changes may mean a "point of no return" and a long illness sets in which might have been avoided with earlier endocrine treatment. Involutional and puerperal melancholia do not respond to endocrine treatment, but their full development might sometimes be prevented by hormonal treatment in the very early stages.—(Abst. by S.C.T. from *Lancet*, 25.7.1953 in *Dig. Neurol. Psychiat.*, Sept. 1953).

THE TREATMENT OF TYPHOID FEVER WITH SOME OF THE ANTIBIOTICS*

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THE treatment of typhoid fever has undergone a radical change with the introduction of the new antibiotics.

We present here an account of the results obtained by us in treating 115 cases which were all clinically diagnosed and subsequently confirmed as typhoid, by suitable bacteriological and serological tests.

Specific antibiotic treatment with chloramphenicol and aureomycin was administered to 75 cases, while the other 40 cases received expectant treatment.

The specific treatment was on the following lines:—

Chloramphenicol.—The routine recommended dose of this antibiotic was *not* given because in some cases within 6 to 12 hours of administration, the patients exhibited symptoms and manifestations of shock.

We therefore gave, an initial dose of 0.25 g. capsules (two such stratum) and one 0.25 g. capsules every two hours for the first twentyfour hours. Next day one 0.25 g. capsule was given every four hours till the temperature came down to normal; after this we gave one 0.25 g. capsule every six hours for the next 48 hours and then one 0.25 g. capsule every eight hours for another 6 days.

The temperature came down to normal on the third day of the treatment, after the administration on an average of 12 g. of chloramphenicol or 48 capsules of 0.25 g. each. In one case 20 g. of chloramphenicol was required, to complete the course.

It had been observed in a fair number of cases, that relapses did occur after the administration of chloramphenicol, even in the full doses recommended.

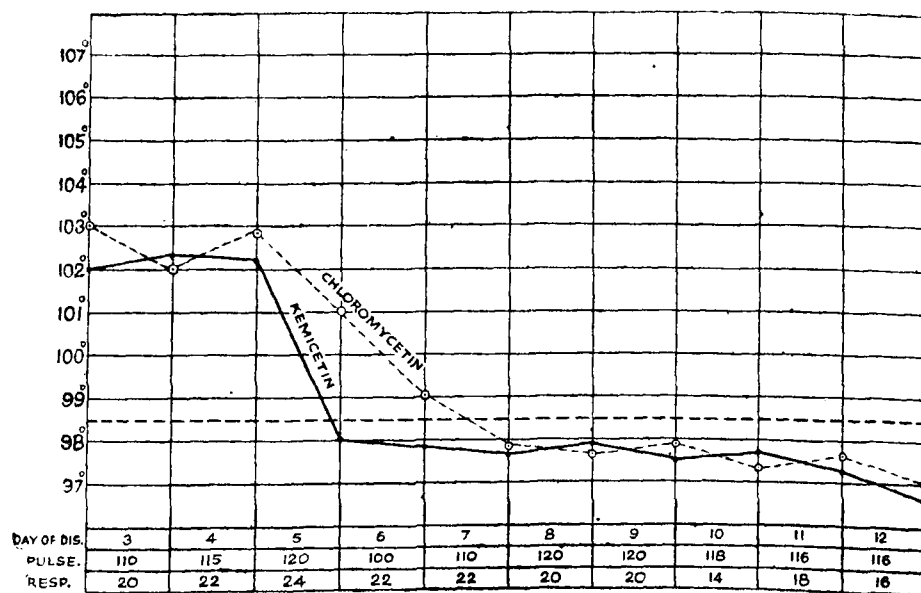
These relapses were probably due to insufficient dosage in many cases; and might be prevented in a certain proportion of cases if the drug was continued for some longer time during convalescence.

Relapses usually occurred in the majority of cases after an average apyrexial period of 10 to 15 days. Except for the relapse no hæmopoietic disturbance was observed.

* Specially contributed to THE ANTISEPTIC.

The relapsed cases were treated as follows:—In some cases where chloramphenicol was started again as early as possible, small doses arrested the progress of the relapse.

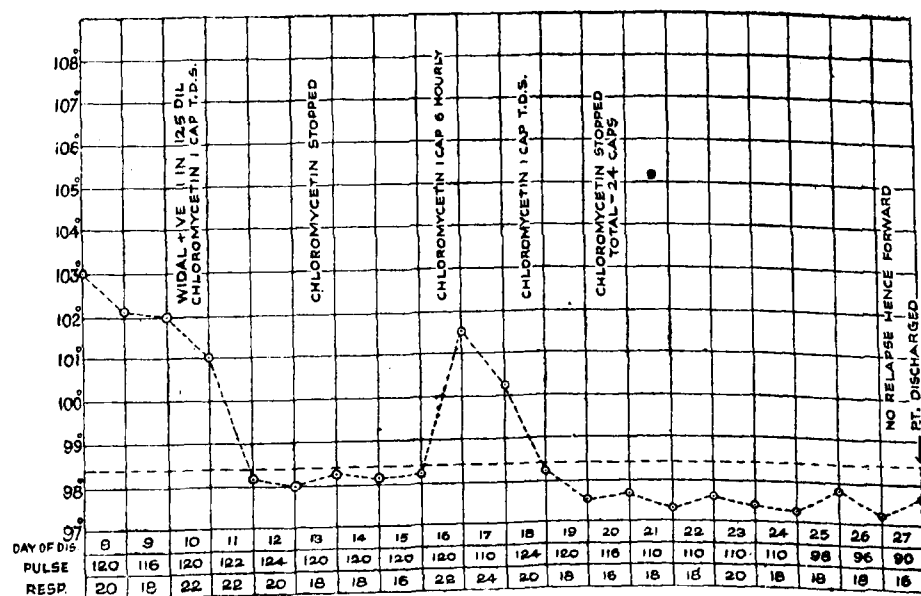
TEMPERATURE CHART I



Early clinical response obtained in kemicetin.

TEMPERATURE CHART II

Name: Mohd. K. Age: 34 Yrs. Ward: A. V. H. Bed No: 2.

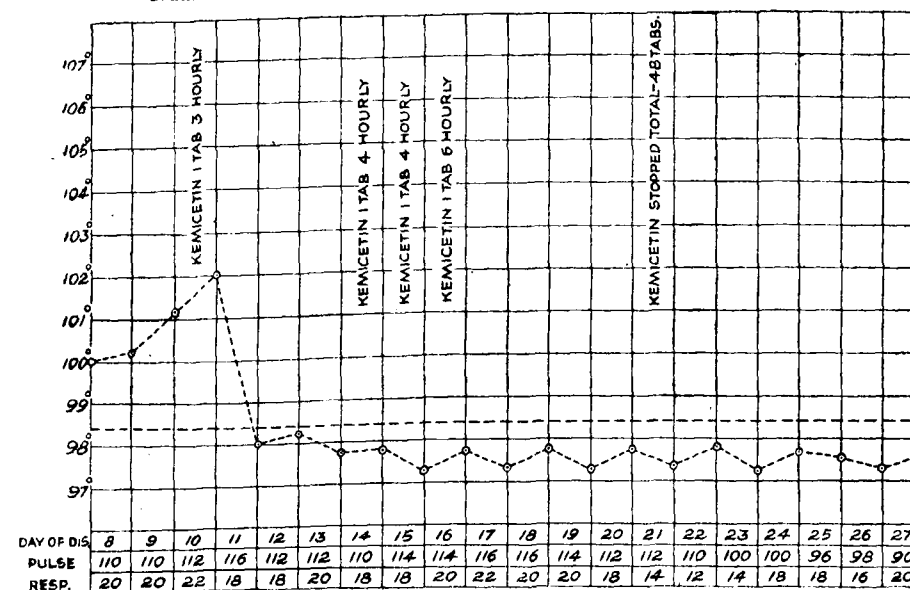


Chloromycetin—administered in inadequate dose—clinical response same as administration of chloromycetin in average dose but relapse followed after 7 days of afebrile period.

Some relapsed cases were treated with immune typhoid vaccine—one ampoule every alternate day in gradually increasing doses was given subcutaneously.

TEMPERATURE CHART III

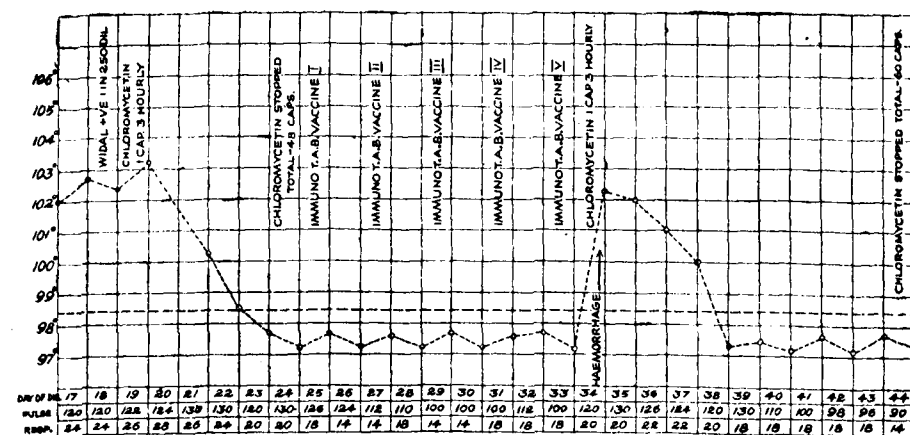
Name: N. M. Age: 37 Yrs. M.H. Ward: A.V.H. Bed No: 22.



Treated with kemicetin alone—with its clinical response.

TEMPERATURE CHART IV

Name: G. O. G. Age: 14 Yrs. Ward: A.V.H. Bed No: 3.

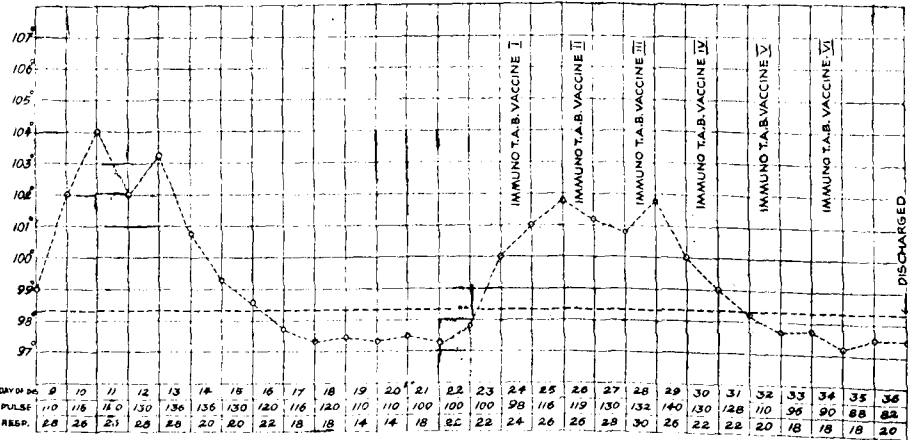


Typhoid relapse with intestinal hæmorrhage treated with chloromycetin.

Aureomycin, terramycin and streptomycin also were tried in some relapsed cases, each independently. The results are given in Table 1 (*vide page 865*). Terramycin and aureomycin were given in doses of 0.25 g. every 4 hours for 6 days. Streptomycin 0.5 g was given twice a day for 6 days.

In cases of typhoid complicated by hæmorrhage and in two cases by perforation, we tried chloramphenicol liberally. In two cases of hæmorrhage, spectacular results were obtained. But it will be premature to draw conclusions of value regarding the efficacy of chloramphenicol in the treatment of typhoid hæmorrhage from these two cases. The cases of intestinal perforation died, before any observations as to clinical progress could be made.

TEMPERATURE CHART V
Name: A. S. Age: 30. Ward: Isolation. Bed No: 55.



Chloromycetin relapse—treated with Typhoid vaccine

The brand of chloramphenicol largely used was Chloromycetin. Synthomycetin and Kemecitin were also used. With Kemecitin the therapeutic response appeared to occur somewhat earlier *i.e.*, after 24 to 36 hours of administration.

A young subject was treated first with chloromycetin palmitate (dose of 1 teaspoonful every four hours) but no response was obtained even after the administration of 0.2 g. of the drug. Then we tried chloromycetin capsule (0.25 g.) rectally and obtained favourable results.

Aureomycin.—Aureomycin was used in the following dosage in only 3 cases which were diagnosed very early,—16 divided into four 0.25 g dose daily, until the temperature came down to normal. The therapy was continued for 7 days beyond the time, when characteristic symptoms and temperature subsided. With further experience and sufficient clinical acumen, the value of aureomycin in the treatment of typhoid fever may be assessed in the time to come. Antityphoid serum 25 cc. was given daily intramuscularly for six consecutive days to 6 cases and expectant treatment to 40 cases, ten of which did not respond.

Conclusion.—Of the drugs used in this study, chloramphenicol was the safest and gave the most satisfactory results in the treatment of typhoid fever. If the cases are diagnosed early and

chloramphenicol is given in adequate dosage, the high mortality due to typhoid fever (such as was happening in pre-chloramphenicol days) will be greatly reduced.

TABLE I
Results in 115 cases of Typhoid fever treated with Antibiotics and by other conservative methods

Drugs used	No. of cases	Bacteriological and immunological findings	Toxæmia.	No. of cases where treatment effective	No. of cases where treatment not effective	Relapse occurred	Treatment of non-effective cases	Result	Treatment of relapse cases	Result
Chloramphenicol.	66	Widal reaction was positive—Ty. H-1/250 O-1/250 in average. In a few cases urine culture was positive.	Severely toxic-16 Moderately toxic-40 Less toxic or no toxæmia-10.	43	7	16	Chloramphenicol and terramycin-2 Streptomycin alone-2 Typhoid vaccine-2 Expectant-1	Cured Do. Do. Other-wise	Chloramphenicol-8 Typhoid vaccine-2 Terramycin-2 Aureomycin-1 Streptomycin-1 Expectant-2	Cured Do. Do. Do. Do.
Aureomycin.	8	Do. Widal reaction urine culture positive.	Moderately toxic.	3	x	x	x	x	x	
Anti-typhoid serum.	6	Do.	Do.	2	4	x	Chloramphenicol.	Cured	x	
Expectant treatment.	40	Widal reaction positive—Ty. O-1/125 H-1/125	Non-toxic.	30	10	x	Expectant	Death due to secondary infection.	x	

Chloramphenicol should be continued for a longer period during convalescence in order to prevent relapses. Many of the common complications associated with typhoid fever in pre-chloromycetin days have considerably decreased in frequency as a result of the antibiotic therapy. The side-effects observed with this therapy are not serious and consist mainly of glossitis, stomatitis and anorexia in a small number of cases.

In relapsed cases where chloramphenicol could not be continued in adequate doses—the use of typhoid vaccine resulted in effecting a cure and this procedure was obviously less expensive.

Relapse cases.—A combination of chloromycetin and terramycin appeared to benefit some of the cases in relapse,

LARYNGEAL TUBERCULOSIS*

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LARYNGEAL tuberculosis is the commonest disease of the larynx; it is always secondary to pulmonary tuberculosis but never primary. It is a common and important complication of pulmonary tuberculosis. The laryngeal involvement may occur at any stage of the lung lesion and occasionally it may be the very first presenting sign, but most commonly it occurs in moderate and well advanced cases. The incidence varies from 3 to 20% of all cases of pulmonary tuberculosis. It is more common in males than in females; and is more prevalent between the ages of 20 and 40. It is rare in children, as they very often develop an acute type of tuberculosis and die before the larynx becomes involved; also their larynx is not predisposed to infection like that of adults by abuse of alcohol, tobacco or working in dust-laden atmospheres.

Though the origin of tuberculous laryngitis is commonly attributed to constant contact with infected sputum in a region where there is considerable movement, the main route of infection seems to be lymphogenous for the following reasons:—(1) The first lesion in the larynx is always subepithelial; (2) even when there are no tubercle bacilli in the sputum, one may still find tuberculosis of the larynx; and (3) tubercle bacilli may be present in the sputum, without any laryngeal involvement.

Occasionally the route of infection may be haematogenous. The site of infection is very often the inter-arytenoid region and the posterior part of the vocal cords.

The pathological manifestations are infiltrations, ulceration, perichondritis and suppuration. These represent the progressive phases of the disease.

Tuberculous laryngitis is one of the most silent among diseases. About 60% of cases have no symptoms at all. Only 40% of cases of tuberculous laryngitis complain of symptoms. Hence laryngeal examination is important in all cases of pulmonary tuberculosis. The most important and the commonest symptom is hoarseness. It may be of a transient nature, being present only in the first few hours in the morning, disappearing as the day advances, or it may be constantly present. The second symptom is soreness on coughing. Later on, when there is ulceration there may be pain or difficulty in swallowing.

On laryngeal examination, one usually finds nodular infiltrations or a kind of mouse-nibbled ulceration in an area of pale colour, the common sites in order of frequency being the inter-arytenoid sulcus, the posterior part of the vocal cords, arytenoids and aryepiglottic folds.

DIAGNOSIS:—Whenever a person comes with a hoarseness of voice, a thorough examination must be done including laryngoscopy, X-ray of the chest and a sputum examination. Tuberculosis must be excluded before excluding other diseases. The common diseases to be considered in differential diagnosis are syphilis, malignancy and chronic laryngitis.

PROGNOSIS:—Involvement of the larynx in a case of pulmonary tuberculosis, definitely makes the prognosis worse. It was formerly believed that involvement of the larynx was a death-warrant; it is not however so bad now, with the modern advances in treatment. Prognosis actually depends on the extent of the lung lesion, the extent of the laryngeal lesion and efficiency of the treatment. However bad it may be, if the lung lesion is arrested, the laryngeal lesion also heals.

TREATMENT:—It should be remembered that one has to deal with pulmonary tuberculosis complicated by laryngeal. The laryngeal lesion will heal to a large extent if the lung lesion is satisfactorily controlled. All possible steps including collapse-therapy where indicated should be taken to arrest the pulmonary lesion. Chemotherapy with streptomycin and PAS is most efficacious in this condition. Rapid healing of the laryngeal lesion occurs as a result of chemotherapy.

So far as the laryngeal lesion is concerned, the treatment is to give rest to the voice. Even whispering should not be allowed. The patient must use paper and pencil liberally. Most cases get well with vocal rest. Local applications have no effect. Voice rest is imperative if the prognosis of the patient is fairly good. In far-advanced cases of pulmonary tuberculosis, there is no point in asking the patient to keep quiet as he is not going to improve at all. If there is pain on swallowing or if there is irritating cough, nupercaine lozenges may do him good.

As regards diet, if there is pain or difficulty in swallowing, a soft diet or milk, cream, butter and eggs may be given. Otherwise, the diet should be normal as far as possible. The patient is the best judge of the suitable food he can take. Very hot dishes and spices must be avoided. Alcohol and tobacco must be prohibited.

The following observations were recorded in a series of 550 cases of pulmonary tuberculosis treated by me at my clinic during recent years:—

- (1) Out of 550 cases of pulmonary tuberculosis, laryngeal involvement with symptoms was observed in 42 cases (7.6 per cent).
- (2) Of these 42 cases of laryngeal tuberculosis, 35 were males and 7 females.
- (3) The age incidence among these 42 cases was:—three between 10 and 20 years, fourteen between 20 and 30, eighteen between 30 and 40, and seven cases above 40 years of age.
- (4) Out of the 42 cases with laryngeal involvement, 17 were diabetics.
- (5) In 2 patients the only symptom was hoarseness. The

* Specially contributed to THE ANTISEPTIC.

lung lesion was discovered when they were X-rayed. The X-ray findings were more or less similar. There was fine mottling confined to the upper zones of both the lung-fields without any cavitation. It may be a particular type of lung lesion with laryngeal involvement where the presenting symptom may be hoarseness to start with. In these two cases the route of infection may be hæmatogenous and it may be a manifestation of generalised miliary tuberculosis. In these two cases, the response to chemotherapy was poor. (6) Most of the cases responded very rapidly to streptomycin together with PAS. In fact the laryngeal lesions healed up earlier than the underlying lung lesions.

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Laryngeal Swabs for Culture of *Mycobacterium Tuberculosis*

Two laryngeal swabs were taken concomitantly with an aspiration of gastric contents in 1,418 patients in the chest clinics operated by the Bureau of Tuberculosis of the New York City Department of Health. Cultures for *Mycobacterium tuberculosis* were prepared 24 hours later. Chaves and his coworkers found that of the 1418 patients 207 or nearly 15 per cent had cultures positive for *M. tuberculosis*, from the gastric contents, from the laryngeal swabs, or from both sources. Of these, 187 or 90 per cent, showed growth from the gastric contents and 135 or 65 per cent from the swabs. Thus, two laryngeal swabs taken at the same time proved to be approximately 72 per cent as effective as a single gastric aspiration for the detection of *M. tuberculosis*. In spite of the conveniences of the swab technique in the clinic, gastric aspiration remains the method of choice for the detection of *Myco-tuberculosis*, in patients unable to produce an adequate sputum specimen. The laryngeal swab technique is worthy of adoption as an additional diagnostic tool for the bacteriological diagnosis of tuberculosis in ambulatory patients to be used when gastric aspiration cannot be easily performed.—(*J.A.M.A.*, 22-8-1953 from *Am. Rev. Tuberc.*, N.Y., May 1953).

Tuberculous Lesions of the Trachea and Bronchi

Though healing of tracheo-bronchial lesions can occasionally occur with ordinary local treatment, or even with bed-rest alone and in selected cases by a plasty operation, the response has not till now been rapid or satisfactory. Brewer and Rogen (*Am. Rev. Tub.*, 56, 408) claimed that quick and complete healing took place in 2 months in all their cases treated with parenteral streptomycin in 2 g. doses daily. Similar good results were also reported by the Veterans' Administration in a series of cases with tracheo-bronchial or laryngeal tuberculosis.—(*Philip Ellman in Med. Ann.*, 1952).

PROTEIN AND VITAMIN DEFICIENCIES IN SURGICAL PATIENTS*

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General.—The knowledge of the importance of proteins and vitamins in surgery is of recent growth. Surgery involves the infliction of a wound and we rely on nature for the healing of that wound. The wound heals by fibroblastic proliferation, for the formation of which protein and vitamins are essential. Adment Clark has shown that the rate of fibroblastic proliferation in wound varies with the body-store and supply of protien, so that in hypoproteinæmia, wound healing may be delayed due to the parent substance being deficient. Another effect of hypoproteinæmia is the alteration in the osmotic tension of the blood and intercellular tissue fluid, resulting in oedema. Oedema of the wound has got a very adverse effect on healing, by retarding fibroplasia. Thus hypoproteinæmia may lead to a dehiscence of wound or more commonly cause delay in wound healing. Dehiscence of an abdominal wound is now rather uncommon due to a proper understanding of this factor and adopting necessary pre-operative correction. Recently we had three cases of disruption of abdominal wound, 2 in cases of acute perforation of chronic duodenal ulcers and the other in a case of pyloric stenosis, following duodenal ulcer. The total protein in all these cases were rather low, about 4 per cent. Apart from the effect hypoproteinæmia on wound-healing, this condition exerts an adverse effect on gastric and intestinal motility, due to the oedema of the gut wall. This is of paramount importance in abdominal surgery, particularly in emergency cases, for the prevention of paralytic ileus.

A deficiency of protein may similarly cause oedema of the cardiac muscles and seriously impair the functions of the cardio-respiratory system resulting in pulmonary oedema.

Vitamins are essentially the chemical catalysers of cellular metabolism. Though all the vitamins are essential for the growth and development of the body, particular mention must be made of vitamins B₁, C and K, deficiencies of which are of considerable importance in surgery. The role of vitamin C in the healing of wounds is well-known. It helps in the formation of the intercellular cement substance and maturation of mesodermal cells. If deficient, the resulting scar becomes weak and of much less tensile strength. Vitamin K is essential for the proper coagulation of blood, the absence of which may cause great difficulty during the operation and the post-operative period.

A deficiency of B₁ decreases the motility of the gastro-intestinal tract, causes loss of tone in the plain muscles and induces serious changes in the heart.

* Paper read at a symposium organized in 1951 in Calcutta by the members of the WHO.

DIAGNOSIS :—The primary effect of nutritional deficiency is a resulting change in the function of the tissues, rather than a change of structure. Once structural changes have occurred, they may become irreversible. It is essential therefore, that the nutritional deficiency is diagnosed at the early stages, so that it may be corrected by proper diet and treatment.

The diagnosis of hypoproteinæmia, and avitaminosis may be made by a careful consideration of the (1) history, (2) physical examination, (3) laboratory help and (4) likely diseases.

1. A detailed study of the diet of the patient should be made (though it is not always possible) with particular reference to his intake of meat, fish and fresh vegetables. Inadequate amounts of these foods over a prolonged period point clearly to a diagnosis of deficiency.

Gradual deterioration in the general health, with loss of weight, fatigue, and lassitude are some of the important symptoms.

2. The physical examination may reveal the well-known gross changes in advanced cases of avitaminosis and protein-deficiency. In subclinical stages however, a careful examination alone will show the presence of deficiency, as manifested by skin changes such as hyperperatosi, papules round hair follicles or erythematous areas over the elbows etc. Petechial hæmorrhage may be seen in Vit. C and K deficiency. The conjunctivæ, corners of the mouth, the lips and tongue are the sites which show early changes in Vit. B deficiency. Protein deficiency may not be quite evident in physical examination. Oedema of the feet may be present but heart disease and epidemic dropsy should be eliminated.

It must be borne in mind that in the majority of surgical cases, evidence of deficiency of one particular food-constituent may be quite apparent but along with it, there may be deficiency also of other food elements. In exceptional circumstances, there is deficiency of one particular vitamin, e.g. scurvy.

3. *Laboratory studies* undoubtedly help in the diagnosis and treatment of malnutrition but the laboratory results should be properly correlated with the clinical findings.

The following examinations are usually made to assess the nutritional state of the patient. Hb%; Red cell count, total protein, albumin and globulin, urea, N.P.N. and an estimation of the vitamins.

The nutrition department of the All India Institute of Hygiene and Public Health furnished the following figures for a normal urban population. Red cells 5·36 million; Hb 95% (Sahli's).

In our analysis of 100 cases of surgical patients, we found the corresponding figures to be Hb 60% on an average, and red cells 3·5 millions; the normal figure for serum-protein being

6 to 6·8% we found it to be 6·4% on an average in a series of 150 cases. The lowest figure was 3·8% and the highest 9%.

Some of the cases with low serum-protein showed high blood-urea. Persistent low serum-protein with marked and substantial rise of blood-urea and N.P.N. indicates a grave prognosis.

Too much stress should not however, be laid on a single estimation of plasma-protein as the true picture of protein insufficiency may be masked by dehydration and protein reserves may be greatly depleted before this is reflected by a change in the level of protein in blood-plasma; the clinician should depend more on the history and physical finding.

4. *Likely conditions :—*(a) *Inadequate digestion :—*Unbalanced diet; gastric ulcer; chronic sepsis; hyperthyroidism; diseases like diabetes, achlorhydria, pyloric stenosis, carcinoma of the stomach, vomiting and diarrhoea. (b) *Defective utilisation :—*liver diseases.

*Ameliorative measures :—*Proteins are synthesised from amino-acids by the liver.

It is important that any deficiency in protein and vitamins should be corrected before major surgical operations. The following measures will help to raise the protein level :—

*Food :—*The diet should consist of high-quality protein e.g., liver, skimmed milk or fish meal. As weight is a useful guide, the patient should be weighed three or four times during the week. Post-operative feeding should be started as soon as possible. Patients do not usually have an appetite for food after an operation but they should be persuaded to eat solid food as early as possible. Protein hydrolysates may be added, if they do not mind the taste.

*Tube feeding :—*If the patient is reluctant to take sufficient food by mouth, feeding by a nasal tube will have to be undertaken and I found the continuous intra-gastric drip of skimmed milk, to be a valuable means of raising the protein level.

Parenteral administration is indicated when the above measures cannot be undertaken when the patient is vomiting, has diarrhoea, or is having a paralytic ileus. It may then be administered by the following routes :—

*Intravenous :—*The most effective and rapid method of dealing with protein-deficiency is to restore the plasma-protein by blood and plasma transfusion. A litre of plasma contains 60 to 80 g. of protein, but the cost is prohibitive.

The intra-sternal route is good for the administration of casein hydrolysates or other amino-acid protein. By this method 200 to 250 g. of amino-acids can be administered.

The pre-operative treatment of patients should concentrate on the diet factor.

Vitamin C is abundant in fresh fruits like the orange and tomato. If however, for any valid reason, fruit juice cannot be taken, parenteral administration of 100-200 mg. of ascorbic acid will suffice. This dose may have to be increased to 1000 mg. a day, in bad peptic ulcer cases.

Vitamin B.—Yeast concentrates are a good source of this vitamin. Vitamin B complex may also be given orally or administered parenterally.

Vitamin A and D are not of much consequence in the surgery of adults.

Vitamin K is a recent acquisition to our knowledge of the use of vitamins in surgery. A deficiency of this vitamin may be expected in patients suffering from diseases of the liver, and biliary passages and from intestinal disorders, particularly those associated with hæmorrhage.

When surgical interference is contemplated in such cases, the prothrombin content and time should be estimated and vitamin K should be administered for a few days. The prothrombin should be estimated again a few hours before the operation. The administration of vitamin K is no guarantee that a lowered blood prothrombin concentration will be restored to a safe level; this has been observed in patients with gross liver damage and consequent inability on the part of the liver to manufacture prothrombin from the vitamin K supplied. The only treatment of any avail in these cases, is repeated transfusion of fresh blood and plasma: serum is useless. The effect of hypo-prothrombinæmia in controlling hæmorrhage may be aggravated by associated infection of the biliary passage, particularly when it involves the liver cells.

Mode of administration.—*Oral*:—2 to 3 mg. tablets with one to 2 g. of desiccated bile-salt for 3 or 4 days usually suffice to restore the prothrombin level to normal in the majority of cases.

Parenteral:—If oral route cannot be undertaken, due to vomiting, the intramuscular route can be utilised. A recently introduced water-soluble synthetic compound which is 3 times as potent as the natural vitamin K, may be preferred. A dose of 10 mg. on alternate days for 3 or 4 injections usually brings the level to normal. In the post-operative phase, this should be continued till the stools are well coloured with bile. In very urgent cases, the intravenous route may be used to tide over the post-operative phase.

It is well to remember that all unwarranted hæmorrhages in surgery are not due to hypoprothrombinæmia. It may be due to other diseases—hæmophilia, scurvy, purpura, purpura hæmorrhages, thrombocytopænia etc.

TUBERCULOUS INFECTION AMONG CHILDREN CONTACTS AS REVEALED BY TUBERCULIN SENSITIVITY*

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THE inauguration of the BCG Campaign in India in the year 1948 has focused attention to tuberculosis which is one of the major public health problems of our country, and which accounts for the death of over five lakhs of persons yearly, the majority of whom belong to the age group of 15 to 35, the period when they should be of maximum value and service to the country. One of the greatest disadvantages of any campaign against tuberculosis has been the lack of reliable statistics regarding the infection, morbidity and mortality in the country; and by the introduction of the BCG campaign, information of considerable value in the epidemiology of tuberculosis has been made available, particularly as regards the incidence among the public, of tuberculous infection, as revealed by the tuberculin tests.

The aim of this study is to point out the salient features of tuberculous infection among contacts of tuberculous cases, as observed in Madras, during last year, as compared with tuberculous infections in other groups particularly among persons with no positive evidence of home-contact with open tuberculous cases, and generally to discuss the reasons for the high percentage of infection among the contacts and bring home the value of BCG vaccination to the contact non-reactors.

The material for this study, was obtained from the notified sputum-positive cases, attending the five tuberculosis clinics in the city; viz., the Government Tuberculosis Institute at Egmore, and the four Corporation Tuberculosis Clinics at the Government General Hospital, the Government Stanley Hospital, the Government Kasturba Gandhi Hospital and the Government Royapettah Hospital. All the contacts of the tuberculosis cases attending these institutions were tuberculin-tested and the results noted. The non-reactors were BCG vaccinated with the consent of the parents or guardians.

The total number of all contacts, tuberculin tested and the number that reported for the reading of these reactions are given in the table below (*vide Table I*):—

The high percentage of absentees is not peculiar to this group only, as it has been observed in the BCG campaign in the City as a whole that the percentage of failures to return for the reading of the results varied from 12% to 15% in any group; the reason for such absentees was either the lack of interest in the parents or their

* Specially contributed to THE ANTISEPTIC.

guardians or the social and economic backwardness of the parents, most of their children being away to earn their livelihood.

TABLE I

	No. Tuberculin treated	No. reported	Percentage of absentees that failed to report for the reading of results
Males	2,418	2,097	13%
Females	2,500	2,139	14%

Methods.—Tuberculin testing was done on the volar aspect of the left forearm, about its middle, sufficient quantity of 5 T.U. being injected intra-

dermally to raise a wheal of about 8 m.m., this quantity being equal to 1 c.c.

Tuberculin used is P.P.D. of the strength of 5 T.U. supplied by the Director of the BCG Vaccine Laboratory at the King Institute, Guindy.

The reaction is read off at the end of 72 hours and the induration measured in millimeters, erythema not being taken into account for the reading of this reaction.

Observations.—The results of these tuberculin testings among the contacts and the percentage of reactors have been set out according to sexes in Table IV for males and in Table V for females according to the age groups.

TABLE II

Age groups	Males—Contacts		Males—Non-contacts	
	Number tested	Reactor per cent.	Number tested	Reactor per cent.
0—4 years	321	50.7 p.c.	562	39.1 p.c.
5—9 "	380	60.0 "	589	52.4 "
10—14 "	391	75.8 "	715	74.1 "
15—19 "	232	90.9 "	1767	90.0 "

TABLE III

Age groups.	Males—Contacts		Males—Non-contacts	
	Number tested.	Reactor per cent.	Number tested.	Reactor per cent.
0—4 years	310	46.2 p.c.	551	35.9 p.c.
5—9 "	408	63.0 "	632	54.7 "
10—14 "	336	75.9 "	518	71.2 "
15—19 "	241	84.6 "	390	83.0 "

TABLE IV

Males—Contacts			Males—Contacts—Contd.		
Age groups	Number tested	Reactor per cent	Age groups	Number tested	Reactor per cent
1 year	37	32.3 p.c.	9 years	53	61.0 p.c.
2 years	87	40.0 "	10 "	113	75.0 "
3 "	119	59.0 "	11 "	49	74.5 "
4 "	78	56.0 "	12 "	112	77.3 "
5 "	110	47.0 "	13 "	56	66.0 "
6 "	87	57.2 "	14 "	61	74.6 "
7 "	56	52.0 "	15 "	50	91.0 "
8 "	74	64.6 "			

TABLE V

Contacts—Females			Contacts—Females—Contd.		
Age groups	Number tested	Reactor per cent.	Age groups	Number tested	Reactor per cent.
1 years	26	32.0 p.c.	8 years	91	58.6 p.c.
2 years	70	48.0 "	9 "	71	73.0 "
3 "	128	53.0 "	10 "	110	77.6 "
4 "	86	37.5 "	11 "	45	66.7 "
5 "	98	55.0 "	12 "	85	75.0 "
6 "	65	61.0 "	13 "	45	76.0 "
7 "	83	70.0 "	14 "	51	83.3 "

In Tables VI and VII the reactor rates among school children, as well as contacts, both for males and females have been shown, so as to bring out the infectivity rates in both the sexes for a comparative appreciation of the high incidence of tuberculous infection among the contacts.

TABLE VI

Male Children

	Age group 0—4 years		Age group 5—9 years		Age group 10—14 years	
	Number tested	Reactor per cent.	Number tested	Reactor per cent.	Number tested	Reactor per cent.
Contacts	321	50.7	380	60.0	391	75.8
School children...	40	30.0	11,173	44.6	16669	60.8

TABLE VII
Female Children

	Age group 0—4 years		Age group 5—9 years		Age group 10—14 years	
	Number tested	Reactor per cent.	Number tested	Reactor per cent.	Number tested	Reactor per cent.
Contacts ...	310	46.2	408	63.0	336	75.9
School children...	43	24.0	7260	40.9	7136	57.7

Discussion.—It will be observed from the above tables that the rates of infection vary widely in the contacts as compared with the infectivity rates among the non-contacts. This difference is at least 35% more among the contacts than among the non-contacts. It may further be observed that the reactor-rates among children-contacts are at least 50% more than the reactor rates among the school-going children with no evidence of contact-history. A further observation that was noted is that the difference of infectivity rates between contacts and non-contacts is much greater in early childhood than in the later life, where the rates of infection observed in the adolescent age-group were almost equal.

Our observation that many more children are found infected among those exposed to this very potent source of infection *viz.*, contact with open-sources of infection at home, than among those not so endangered, is almost on a par with that of various other workers in this field, some of whose findings are given below.

Drolet in a study of 6646 cases of children attending tuberculosis clinics, found that among children under five years of age, 41% of those with a history of contact with open cases, reacted while among those with no such history only 28% reacted, and that in the adolescent group, the reactor rates were almost equal in both the contact and the non-contact groups. Such observations, have been made, among others, by Whitney and McCaffrey in the United States of America, and by Dow and Lloyd in London. Special mention in this connection must be made of the work of Dr. Dargeon of St. Luke's Hospital, New York where the following observations were recorded.

Age group	Reactor—Rates in	
	Contacts	Non-contacts
Under 5 years	48 p.c.	6 p.c.
between 5 and 10 years	27 „	13 „

Overwhelming evidence is now available that the rates of infection and active disease are many times higher in the family contacts, than in the general population. The importance of this

infection in the family contacts and the resultant value to any epidemiological investigation has been stressed by Chadwick and Pope. The concept of Downes, who emphasises the importance of this family-infection as a factor in the perpetuation of tuberculosis, strengthens the importance of the family as an epidemiological unit in tuberculosis.

Conclusion.—Tuberculin-testing plays an important part particularly among the child and adolescent contacts. That casual-infection is much less serious than the dangerous contact-infection should always be remembered. Tuberculosis families constitute a stock more susceptible than the non-tuberculosis stock—a concept of recent origin. Hence contact examination is of particular importance in the children of tuberculous households. Kayne concludes that the younger the infant, the more likely is he to get infected and the younger when infected, the graver is the prognosis. The British Medical Research Council advocates radiographic examination of young adults at three-monthly intervals and keeping under observation for at least two years after breaking the contact. The danger of heavy exposure always persists among these contacts and hence a search for finding out as many contacts as possible before infection occurs, should be the aim, in this preliminary step in prevention of the disease among the susceptibles.

It is to this large group of persons whom one usually refers as 'specially-exposed' to the ravages of frequent and repeated infections, that protection should be given and that protection given to these normal contacts may be even more important than the medical supervision of the small fraction who have developed the disease. However mild and small the quantum of infection may be the isolation of the tuberculous is of primary importance in protecting the home contacts, by removing the known source of infection, and thereby allowing a healthy home-condition.

Overcrowding and housing conditions are two other environmental factors of importance, next only to the source of infection, together with the poor socio-economic condition and malnutrition, which go to form the vicious circle, that contributes to the great increase in the incidence of infection, morbidity and mortality among any group.

In countries with excessively high tuberculosis morbidity and mortality rates, and with very limited facilities for the segregation of the infective, and where there is a large demand for medical campaign against tuberculosis and for man power, material and money and where there exists a low standard of living, it is generally accepted that the Mantoux-negative contacts of all ages, should have the protection, that is afforded by the BCG vaccination. However much opinions may differ on the use of BCG vaccination in other groups, it has been universally accepted even by such critics as Myers of Minnesota and Wilson of Great Britain, that the

especially exposed groups of persons, viz., contacts, infants and young adults, who have escaped natural primary infection, should have protection by BCG vaccination.

I cannot better conclude this paper than by quoting Gaylord W. Anderson, who while addressing the 48th Annual meeting of the National Tuberculosis Association, at Boston, said :

"We must recognise the fact, that surveys do not take the place of careful epidemiologic investigation of contacts in the discovery of sources and new infection. If there is one thing we have learnt from epidemiological investigations during the past quarter of a century, it is the importance of repeated household-contact with adults, in the spread of infection. It would be unfortunate if we were to lose sight of this fundamental epidemiological factor and so alter our case-finding programme that we fail to place chief emphasis upon the family-contacts among whom the risk is at a maximum".

Acknowledgements.—I am grateful to Dr. (Mrs.) Philip, Director, Government Tuberculosis Institute, Egmore for her guidance and valuable suggestions and for kindly permitting me to utilise for publication, the scientific material collected during our BCG campaign in Madras City.

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Typhoid Treated with Cortisone and Chloromycetin

Dana *et al* found that the most striking effect produced by combined treatment with chloromycetin and cortisone in uncomplicated cases of typhoid was the rapid decline in the temperature which came down from 104° F. to less than 98.4° F. in from 12 to 24 hours. The pulse rate diminishes and the stupor disappears. Splenomegaly regresses. The complications noted in this series of 13 cases, comprised 3 cases of encephalitis and one of severe intestinal hæmorrhage. Penicillin and streptomycin together with blood transfusion controlled these conditions. Relapses of varying severity occurred in 5 patient usually after 3 to 5 days but ultimate recovery was complete in all cases. Cortisone offers real advantages when used as a supplement to chloramphenicol in the treatment of typhoid.—*Tunis Medica*, Tunis, March 1953, and *J.A.M.A.*, 15-8-53).

THE NEED FOR COMPREHENSIVE HEALTH SERVICES IN INDUSTRY*

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WE live in a world where problems of war and peace must be solved through industry. The prosperity of our nation depends very much upon industries, big and small and on adequate food-production. The industrial health programme affords the best opportunity to set preventive medicine in motion for the well-being of a large section of an urban community. Medicine has advanced from being merely a curative art, to a more comprehensive one, to include sanitation, protection of water and food supplies, control of communicable diseases and protection of individuals against epidemic diseases; and today it is increasingly associated with the sciences of sociology and psychology.

Industry cannot afford to neglect the care of the healthy, until they get sick. An industrial health service aims at discovering the root causes of illness while the worker is seemingly well. Health services, organised by employers ensure good health which permits the worker to retain his earning capacity, and the employer to secure more efficient service and have greater production. Health services reduce the worker's suffering, and his expenses, benefits his family and helps the community at large to progress. An industry, large or small, which provides a comprehensive health service to its employees and their families is making a great and valuable contribution to the well-being of the community.

The worker acquires a certain degree of security under such conditions. The Hindu joint-family system gave social security to Hindu society. The impact of the Western systems, the large exodus of workers from the village to the towns and the consequent change from rural to urban life, the increasing value attached to money and wealth, all these have tended to shift the importance of the joint-family as a unit to the individual and his material achievements. In his village he looked to his neighbour and to his own relatives for assistance in an emergency. In the city, he has to look up to the pawn-broker for help. And when he gets ill or disabled, he is in want, feels worried and fearful about his future.

A worker, who lacks the means to obtain suitable treatment, and is in constant fear of losing his job cannot bear to be told that he has early tuberculosis. This attitude is no doubt wrong and short-sighted, but how could one with no savings, be interested in long term health policies? If industry is to thrive and have contented work from workers who are free from fear and want, the worker and his family must be adequately covered by protective insurance

* Specially contributed to THE ANTISEPTIC.

schemes, to meet the cost of sickness, and accident and to maintain himself and his family above want during illness and old age.

To establish harmony in industrial concerns, the worker, as a full human individual, must be considered, not merely the eight-hour 'work-hand'. A worker's feelings and fears, his needs, his hopes and his potentialities all form part of his health problems. A study of these factors, and the offer of help to the worker when he cannot help himself form the basis of industrial health; in other words, the building up of sympathetic human relations improves efficiency and raises the dignity of labour. Industrial health programmes should therefore envisage the man's work and home environment, his physical and mental fitness and his family happiness.

In our country 'man-power' is still very cheap and plentiful, as evidenced by the daily sights we see of heavily-laden hand-carts drawn by two male and one female 'man-power'. Industry realises that adequate safety measures are productive as they reduce accidents and absenteeism, while a first aid-post is but a palliative calculated to shorten absenteeism. In an analysis of absenteeism, the greatest loss in man-hours is caused by sickness. The employer by providing free curative treatment helps the worker to return quickly to work. The cost of free treatment thus met by industry, is really 'payment in kind', and certainly not charity. The efficiency of such a service depends upon the diagnostic equipment provided and the availability of potent drugs irrespective of cost. The results of modern medical and scientific research must be made available to the worker.

Factory Acts and Workmen's Compensation Acts have been responsible for bringing medical men into industry. These 'company-doctors' mostly render part-time service; the tendency of the worker is to use them for obtaining sick-leave or to have their minor ailments treated; the management depends upon them for physical fitness examination. The Industrial physicians' job is a medical speciality. He must know the nature of the individual's work, the processes of manufacture a worker is engaged in, and he must be able to evaluate temporary and permanent disability and relate the symptoms to the worker's trade. He must have the patience to listen to the worker's tales of woe, be pleasant, and courteous to him and bestow adequate care on his ailments.

It will pay the smaller industries to combine together, in each locality and provide diagnostic and consultant service, even after the Government's scheme of Employee Insurance takes over the treatment of the sick workers. A large amount of medical service in a factory could be undertaken and records maintained by nurses with public health training. In our State where there is a shortage of doctors and the panel system is not in vogue, industries could

secure maximum benefits for its workers and maintain happy relations by taking care of the worker and his family. The workers in our city do not always live around the work-spot; the Health Centre has however to be located near it, in order to save time and money. It is best to have all available services in one place so as to avoid the expense, time, inconvenience and irritation in having to send workers from one end of the city to another for expert consultations and/or X-ray examinations.

The cost of the health service depends upon the scope of the programmes. Here in our city, industry needs:—

I. Case finding through multiphased screening centres. —(a) to test sight and hearing; (b) to measure height, weight and metabolic rate; (c) to make a dental survey and throat examinations; (d) a clinical laboratory for testing blood, urine, faeces, sputum, blood sugar and fractional test meal Wassermann and Kahn tests; and (e) chest X-ray and electro-cardiograms.

II. Physical fitness examination.—Pre-employment examination for the selection of those physically and emotionally suited for the job; periodic examination of all employees once every year to assure continued physical fitness and compatibility with the job, to follow up convalescent cases and discover early signs of physical changes that may deter his earning capacity.

III. Job-placement and health-education.—A department devoted to Health education; nutritional study as malnutrition is the basic problem of health; counselling; guidance; and job-placement.

IV. Maintenance of healthful working environment.—Research, sanitation and hygiene, and the prevention of accidents and of diseases caused by toxic materials, fatigue etc.

V. Curative medicine.—Co-ordination with Government institutions and the maintenance of an emergency ward for the acutely ill and those in need of bed-rest; home-care also in certain cases.

Industrial Health Programme

Rear Admiral H. E. Haven of the United States Navy, Washington writing in the September 1953, number of Industrial Medicine and Surgery says: "An industrial health programme should offer a comprehensive approach to the total occupational health needs of the employee population. A well-administered and complete programme should result in benefits both tangible and intangible, i.e., dividends should accrue in cold, hard dollars and cents as well as in improved morale. Specifically some of the expected results are savings in avoidable expense to management and employee, increased production quality and quantity, reduced production costs, decreased labour turnover, lowered accident rates, reduced sickness absenteeism, improved worker morale, and job satisfaction, improved employee interactivity relationship, and better community relationships.

The physical demands of job classifications in co-operation with the production department would result in better utilization and better placement of physically handicapped individuals.

VI. Surgical treatment.—Injuries during work, or outside, needs the attention of a specialist in traumatic surgery since injuries to hands and fingers are most common. Rehabilitation of the disabled; occupational and physiotherapy.

VII. Care of families.—To relieve housing shortage and congestion in one-room tenements, a maternity home will be helpful in many ways.

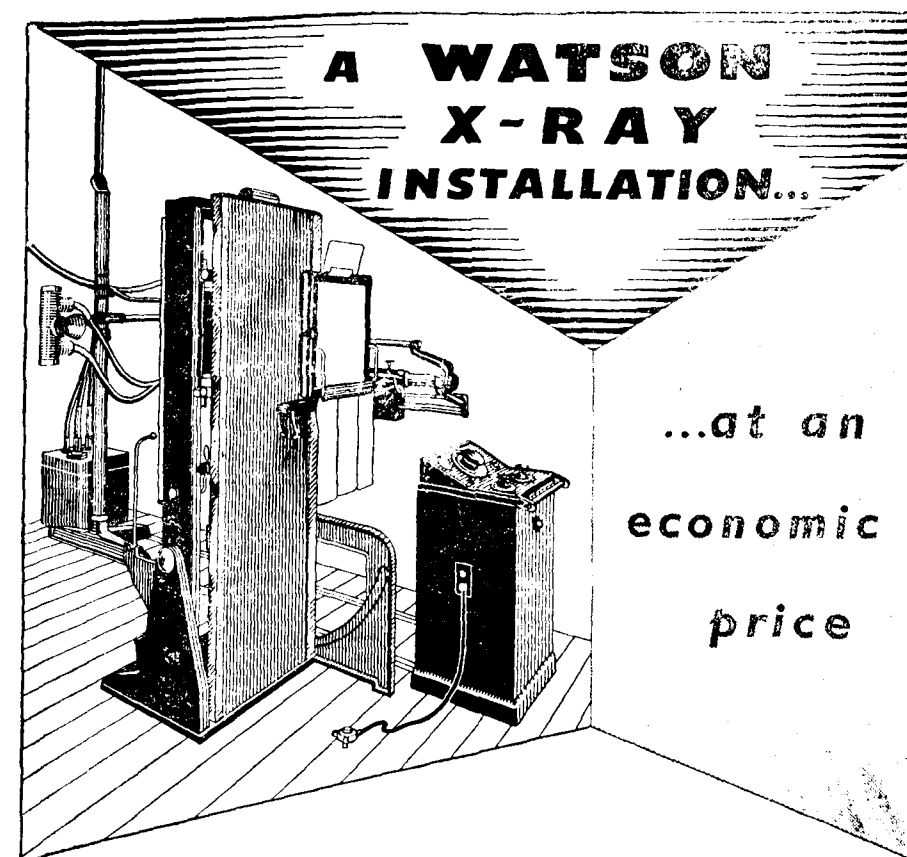
Such health centres if maintained by insurance companies will help people to become health-conscious and reduce company liability. The Governments Employee Insurance Scheme will not be a substitute for an efficient Industrial Health Service, unless it takes the "Whole Man" in its compass.

Medical Programmes of Industrial Health Services

The Commander of the Puget Sound Naval Shipyard, an employer of a very large labour population, states:—"The present laws, rules and directives, allow for the setting up of a complete occupational health programme and are applicable to all industrial establishments. It does not follow that all programmes are equally good. Personal observation has shown that there is a great disparity in the effectiveness of the programme in different establishments. There are a number of reasons for this. Chiefly, they are influenced by the philosophy of management, budgetary allowance and the imagination, training, interest and knowledge of the medical officer. Obviously the medical officer is the most important of these. He must first of all have an interest in this type of work and not only should he have training in the arts and mechanics of his profession and specific professional knowledge of occupational health, but also he should have a thorough knowledge of all the laws, rules and directives pertaining to his work, as promulgated by the various departments of Government and by the Bureau of Employee's Compensation. This should include a comprehensive knowledge of the industrial processes of the establishment and a knowledge of industrial management, industrial and personal relations, policies and problems, so that he can co-ordinate the functions of the Medical Department into an harmonious and integral part of the general organization with a programme that is materially acceptable to the management, to supervision and to the individual worker.—(*Indust. Med. Surg.*, Sept. 1953).

How? Where? When?

Most of the difficulty in deciding about compensations is due to the fact that the examining physician does not enquire sufficiently into the details of the alleged injury. He may not take the trouble to corroborate the story given by the patient, from independent witnesses to the accident. Likewise in the examination procedure it is not wise to rely on the absence of symptoms or a lack of outward signs to reassure one that some occult injury has not taken place. If there is a reasonable chance that injury could have occurred, because of the "how," "where" and "when" of the alleged injury, diagnostic procedures must be employed to insure that the results are negative.—(*Dr. Carlston in Jour. Iowa Med. Soc.*, Aug. 1953).



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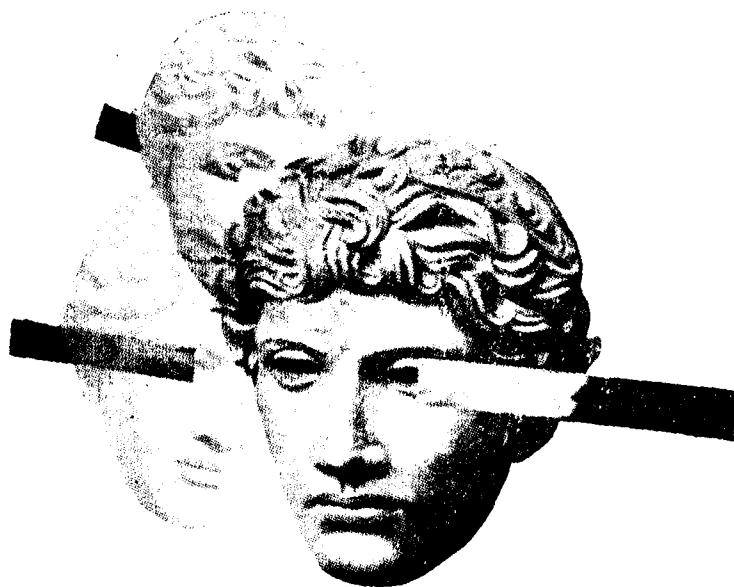
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cure of trachoma was uncertain and the treatment had to be continued for 1 to 6 years or longer. Aureomycin, on the other hand, has resulted in a very marked clinical improvement and striking symptomatic relief, no matter how severe the case; a fact which has prompted an eminent authority to state that all previous methods pale into insignificance before aureomycin.

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Cases and Comments

HAZARDS OF BCG VACCINATION

Two Cases of Severe Unusual Aberrant Tuberculin Allergy

GURSARAN SINGH, M.B., B.S., D.O.M.S.,
Circular Road, Solan, Himachal Pradesh.

A CHILD, S. S., aged 6 years was tuberculin-tested on the 13th April '52. It is said that the needle got bent during the first application. A second attempt was also equally unsuccessful. The third attempt was successful. But it was noticed that traces of blood were oozing from the injection wound. Much attention was not paid to this and the child left the centre without any apparent complaint. The child got fever up to 102°F in the evening. Next morning prickly-heat-like discrete eruption was noticed on the hands, arms, feet and legs. The parents thinking it to be some sort of exanthematous eruption tried homoeopathic medicines without any effect. The child was taken on the 16th April '52 to the hospital-centre where the original tuberculin test was done. The Medical Officer in charge advised the parents to administer antistine to the child. The fever and the eruption subsided by the 18th April '52. During this time the local reaction was negative. The child was complaining of pain in the abdomen for which the parents consulted the hospital doctor once again. Nothing wrong was detected and no special treatment was given. This was the only symptom that the patient was complaining of until the 24th April '52 when the child began to pass frequent stools containing pure mucus, followed by considerable tenesmus. The child was brought to me for the first time on the 25th April '52. For the next 6 days the child continued to pass mucus in the stools and the temperature was ranging between 102°F. and 106°F. There was no blood in any of the stool specimens. The treatment given was as follows: On the first two days sulphaguanidine and enterovioform along with antistine and vitamin C were tried without any benefit. On the third and fourth days streptomycin injections were given with no better result. On the fifth and sixth days aureomycin was tried and this drug seemed to do good, although the favourable results might have been due to the lessening of the severity of the original illness and the increasing resistance of the body. The child suffered also from burning of the eyes and occasional epistaxis.

It appears that this unusual type of reaction was due both to allergy and to the introduction of a bigger dose of tuberculin than the intended one. It is suggested that in case of mishaps (broken needle) the second attempt at tuberculin-testing should be delayed for a few days. We should be more than ever cautious, as such mishaps are likely to escape notice in the immensity of the nation-wide mass-vaccination programme.

CASE 2.—A child aged about 9 years was given tuberculin test along with other members of the family including four brothers and sisters living in the same environment. Excepting the child in question the other members of the family proved positive to tuberculin. This particular child got fever ranging between 100°F. and 102°F. after 3 or 4 days of the test, with pain in the neck-glands that were very small and just palpable. The fever subsided after 8 days. The child was in a very weak state of health and was rickety. He showed no local tuberculin reaction. If he had not developed the fever he would have got BCG vaccination which, in my opinion, was not needed for this baby. Only children with fairly good health should be tuberculin-tested and if other children in the same family show positive reaction, any child showing a negative result should be retested for tuberculin before BCG vaccination is ultimately advised or adopted.

Tuberculosis and Leprosy—Immunological Studies in Healthy Persons

Dr. John Lowe, Leprologist of the Nigeria Leprosy Service, reports the results of the lepromin and tuberculin tests in healthy subjects. Several workers have reported that BCG vaccination of healthy persons converts not only a negative response to tuberculin into a positive one but also a negative response to lepromin into a positive one in the same person. Most leprosy workers consider that a positive lepromin test indicates a degree of immunity to leprosy. They have therefore, advocated BCG vaccination in persons, particularly young children of leprosy parents, who are intimately exposed to leprosy infection and good results from this measure are already being reported.

Dr. Lowe examines this hypothesis, that between tuberculosis and leprosy, there exists a cross-immunity which may have an important bearing on the immunology, spread, prophylaxis and epidemiology of leprosy. In an analysis of the results of simultaneous lepromin and tuberculin tests in 359 healthy persons in Nigeria, the degree of agreement between the results of the two tests was found to be quite significant; the reason for this high degree of agreement is considered to be that tuberculous infection, as shown by the tuberculin test, makes people sensitive to lepromin as shown in the lepromin test. The reports of similar studies in other countries by other workers have been found to give similar results. In this study by Dr. Lowe, the findings are also presented on the effect of BCG vaccination on the lepromin and tuberculin tests in healthy persons. In 65 persons previously tuberculin-negative, 64 were made tuberculin-positive. Of 58 of the same persons previously lepromin-negative, 40 were made lepromin-positive and 14 were recorded as "doubtful". Lepromin conversions were seen only in persons who showed tuberculin conversions. The available evidence is suggestive though not conclusive yet, that a positive lepromin test indicates immunity to leprosy. Dr. Lowe endorses the view of Chaussinand that "BCG vaccination deserves to be widely used in areas where leprosy is common and is difficult to control and where the future extension of tuberculosis constitutes such a terrible menace", with the proviso that the work be so planned and carried out that it affords adequate evidence of the value of BCG vaccination in the control of leprosy and tuberculosis and that the use of BCG shall not be regarded as rendering unnecessary the isolation of open cases from other persons, particularly children.—(*Br. Med. Jour.*, 12-9-1953).

CHRONIC ASTHMA AND CORTISONE

T. T. V. SUBRAMANYESWARA RAO, M.B., B.S.,
Physician, Surgeon and Eye Specialist, Masulipatam.

A 38 YEAR old woman had been suffering from asthma for three years, and the asthma was controlled till recently by the conventional methods. She developed asthma in June '53 and had hæmoptysis almost every day. She was put on the usual asthma-mixture along with adrenaline parenterally whenever necessary and theophenel tablets which proved to have some little effect. But gradually the number of tablets had to be increased to obtain the little relief which she was deriving.

On 2-7-'53 a skiagram of the antero-posterior view of the chest was taken. But for the increased vascular markings, no evidence of infiltration was seen.

Results of other tests :—Sputum : negative for acid-fast bacilli, Blood :—differential count : polymorphs : 70% ; lymphocytes : 25% ; eosinophils : 5% ; hæmoglobin : 60 per cent ; urine : no albumin and no sugar.

Further treatment with antihistaminic drugs, carbarsone orally and antispasmodic drugs like khellin were continued for nearly another month, without any effect. Having failed to secure relief from the accredited drugs, I tried cortisone in the following dosage and with the results noted alongside.

Day of treatment	Quantity given	Route of administration	Progress noted
First day	150 mg.	Intamuscular injection	{ Dyspnœa disappeared { Hæmoptysis continued { No hæmoptysis { No dyspnœa { Severe glossitis { General outlook improved
Second day	150 mg.	do	
Third day	75 mg.	do	
Fourth day	75 mg.	do	
Fifth day	One tablet of } 25 mg. 4 hourly }	Orally	Anæmia slightly improved
Sixth day	25 mg. } 25 mg. 4 hourly }	Intramuscularly Orally	

Oral administration was continued at the rate of one tablet every 4 hours for four days. It was reduced to three per day for the next four days. The drug had to be discontinued after this period owing to severe nausea, vomiting and salivation.

She was symptom-free for three weeks after the drug was withheld, when she had a recurrence. She was immediately put on Cortone at three tablets per day and she improved considerably within twenty four hours.

Conclusions.—1. Cases of intractable asthma, appear to benefit by cortisone. 2. A comparatively small dose appears to be

adequate for securing improvement in a short time. 3. Cortisone does not seem to possess any permanent curative property in asthma. 4. Elimination of other causative agents is imperative. 5. The prohibitive price of the drug considerably restricts the scope of its usefulness and only the very intractable cases may be treated *after* all the possible conventional methods of treatment have been tried and found wanting.

Don't do this for Asthma

The following is an excerpt from an article by Dr. Oscar Swineford, Jr. M.D., of the University Hospital, Charlottesville Virginia, setting forth the recommendations for the correction of some of the more commonly observed errors in the management of asthma; this formed the basis of the Annual Report of the Allergy Clinic of the Virginia University:—

"Don't use ACTH or cortisone except:—(1) To relieve status asthmaticus. (2) When prolonged treatment, based on comprehensive and repeated analyses of the patients' asthma problems, has failed. (3) To supplement unsuccessfully treated seasonal pollen asthma.

Status asthmaticus means asthma which has not been relieved by adrenalin, aminophylline, potassium iodide, sedatives and antibiotics in pharmacological doses. Twentyfive mg. ACTH intramuscularly every 4 hours usually improves status asthmaticus within 4 to 20 hours. An initial slow I.V. drip of 10 to 15mg. in 1000 c.c. of 5% glucose seems to bring quicker relief at times. Reduce the dose and lengthen the interval between doses, rapidly, as soon as the attack subsides, then stop ACTH.

Cortisone usually takes several hours longer than ACTH to relieve severe asthma. Otherwise it seems as effective. It works faster by mouth than injection, a real advantage. An initial oral dose of 100 mg., then 75 to 50 mg. every 4 to 6 hours, brings relief in 12 to 30 hours in all but the most severe attacks. The dose should be lowered and the interval lengthened, as with ACTH, as soon as the attack subsides.

Oral cortisone is preferred as maintenance therapy in chronic asthma, resistant to other therapy. After relief is obtained, use the smallest ration which will keep the patient comfortable.

Don't allow an asthmatic to get sick enough to threaten life without putting him where he can be bronchoscoped, if necessary. Aspiration of inspissated sputum is a life-saving procedure occasionally, less often since the advent of ACTH and cortisone. The indications for bronchial aspiration are simple. First, a severe attack of asthma resistant to conventional remedies. Second, one or more areas of the lungs which have markedly diminished breath sounds persisting for several hours.—(Virginia Medical Monthly, March 1953 and Cur. Med. Dig., June 1953).

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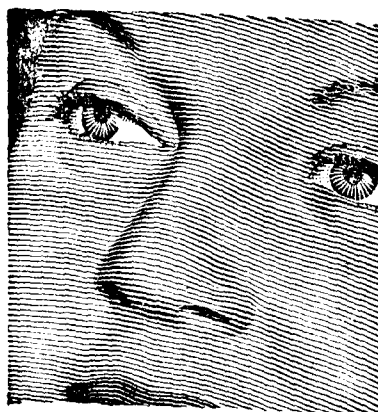
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Editor: U. VASUDEVA RAU, M.B., B.S.,

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

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

Vol. 50

DECEMBER, 1953

No. 12

TREATMENT AND REHABILITATION OF LEPROSY PATIENTS

Rise in Incidence of Leprosy—Pilot Projects for Mass Treatment

OF the five million persons who suffer from leprosy in the world, nearly two million are estimated to be in India and this shows the magnitude of the task of attempting to eradicate it from the country.

The eight-day International Conference on Leprosy sponsored by two Christian missionary organizations viz., the Mission to Lepers and the American Leprosy Missions, which was held at Lucknow during the second week of November 1953, under the presidentship of Shri K. M. MUNSHI, Governor of U. P., was indeed a momentous one. Shri MUNSHI referred to the two-fold nature of the problem (treatment and rehabilitation) and said the Uttar Pradesh Government was considering the question of setting up two leper colonies at Lucknow and Deoria where in addition to the treatment on modern lines, the patients could be provided with occupational therapy in the shape of co-operative farming and small cottage industries. As part of the antileprosy campaign, the U. P. Government had established a model leprosy unit with its headquarters at Gorakhpur. "Leprosy" said he "was a socio-medical problem and those who have worked to relieve the world of this ugly disease, have worked with surpassing heroism". Shri C. B. GUPTA, the U. P. Health Minister, referred to the persistent efforts of MAHATMAJI when he was alive, to focus the attention of the people towards the service of those who were suffering from this fell disease. Shri DEVADAS GANDHI in his presidential address at the Puri Conference on Leprosy early this year, stressed that "the

successful solution of the leprosy problem demanded the closest collaboration between official and non-official agencies. He paid a glowing tribute to pioneer work of foreign Christian Missions in the field and pleaded for the urgent intensification of national efforts in this cause, especially in view of the changed conditions. "Leprosy relief should be placed high up in the priorities of our national programme, as it calls for the same crusading zeal with which we tackle such basic problems as poverty, illiteracy, and diseases in general". Around the nucleus of missionary-inspired organisations, equally devoted public bodies have sprung up in recent years among which may be mentioned the Hind Kusht Nivaran Sangh, and the Gandhi Memorial Leprosy Foundation and similar bodies. The Central and the State Governments as well as local authorities have also started taking an active interest in the problem.

Dr. RAJKUMARI AMRIT KAUR, our Union Health Minister who addressed the plenary session of the Conference, urged that it was of the utmost importance that leprosy patients should not be made to suffer from a feeling of inferiority, merely because they happened to suffer from that disease. Any psychological change on the part of the patients themselves alone could not help to rectify matters. The attitude of the community at large towards these unfortunates was far more important, and the social ostracism to which they are subjected should disappear altogether. "National recognition of Leprosy as an important public health problem" said Dr. RAJKUMARI, "was given, when Gandhiji with his universal love and sympathy for the down-trodden and the afflicted, created the necessary enthusiasm among the leaders for the welfare and rehabilitation of the people suffering from leprosy".

Control measures on a nation-wide scale can be successful and efficient, *only* if investigation of leprosy as a public health problem is first carried out in local areas, and suitable preventive and curative measures are adopted in highly endemic localities; voluntary efforts should be mobilised to the maximum extent possible and coordinated with Government's efforts. Leprosy control has now been given an international level of importance, after India achieved her Independence. Dr. RAJKUMARI referred to the disconcerting reports of an increase in the incidence of leprosy in Bombay, Rajasthan and Madhya Pradesh. Certain parts of Madras, Travancore-Cochin, Orissa, West Bengal and Bihar were highly endemic areas for leprosy.

The Gandhi Memorial Trust had established a Leprosy Foundation and set apart 90 lakhs of rupees for combating this disease. Many State Governments and local authorities are now considering the provision of out-door accommodation for leprosy sufferers. The Central Government was contemplating the provision of facilities for research and for post-graduate training of leprosy-workers. The Five Year Plan provides for the establishment of a Leprosy Institute

for this purpose; already we notice that active research in several aspects of the problem is being carried out at a number of centres all over the country—a most welcome sign of national awakening to realities.

The need for research work in the Leprosy-Control programme appears to be all the more imperative in the light of an important observation made in a recent report from the British Information Services, dated the 9th November 1953, on the use of BCG as a means of giving immunisation against leprosy, which is to be the subject of intensive study and experiments in West Africa. As it has been observed that people given BCG who have negative reactions to tests for tuberculosis and leprosy have developed positive reactions to both, it is felt that BCG may therefore, give some immunity from leprosy. Hence the contemplated research in West Africa, the results of which will be awaited with interest.

We are indeed glad to be told that the Union Health Ministry is also considering the establishment of a number of pilot projects in highly endemic areas for mass-treatment of leprosy with sulphones. These projects, we are told, will function as treatment centres for patients and contacts and actively cater to the need for educating the public and also investigating the problem in its varied aspects. While the Union Health Minister was greatly impressed by the devoted services rendered by missionaries both in the past and in the New India and also desired that the people should gratefully acknowledge their great services, she felt called upon to sound a warning note in these terms: "The only thing that is desired by the Government is that the foreign missionaries should keep themselves entirely aloof from political propaganda and work".

Mr. A. DONALD MILLER, General Secretary to the Mission to Lepers who also spoke at the Conference stated "We desire to take the fullest advantage of advances in medical knowledge and treatment. Some delegates have come direct from the International Congress of Leprologists at Madrid in Spain, which studied the disease as a disease and the drugs as they affected the disease; the Mission's work for children suffering from leprosy and children placed in dangerous contact with leprous parents or relations must also come under review, because of changing social conditions and advances in medical knowledge.

We fully endorse this very essential aspect of Leprosy control, as it relates to the children, who form the most susceptible section of the population.

— — —

"In the context of all the recent advances in diagnosis and treatment of leprosy great emphasis is to be laid on the after-care of the 'cured cases'. The inescapable responsibility of the State as well as of the general public is becoming increasingly manifest".—(*Leprosy in India*, April 1953).

SICKNESS INSURANCE FOR INDUSTRIAL WORKERS

(Regional Board set up for Southern Region)

[INAUGURATING the Madras Regional Board of the Employee's State Insurance Corporation on 12th November '53 at Madras, Shri V. V. GIRI, the Union Labour Minister said "The employers who have been paying the special contribution all these months have reason to be restive and it is our duty to allay their misgivings by tangible evidence of the Government's ability to implement the Scheme and thereby give due return for their contributions. It will be one of the duties of the Regional Board to ensure that better progress is made in such implementation throughout the country, and that a better standard of service and satisfaction is rendered to the industrial workers". There no doubt exists a popular feeling and a general impression that if the Regional Boards had been set up at the same time as the Regional Office was opened in February 1952, much headway might have been made and the Board would by now have familiarised itself with the problems incidental to or necessary for a successful implementation of the scheme in many industrial centres in the region. Even in the matter of introducing it in one centre in the Madras State viz., Coimbatore, some difficulties have been met with, we are told. In Bombay and Calcutta the two principal industrial centres in the country, considerable difficulties are being experienced. The difficulty has been mainly in setting up a satisfactory agency for providing medical treatment to the twenty five lakhs of industrial workers who will be affected by the scheme. When the "Bill to provide for certain benefits to workmen employed in or in connexion with the work of factories in case of sickness, maternity and accident and to make provision for certain other matters in relation thereto," was circulated for public opinion in December 1946, neither the Central Government nor the States Governments appear to have had any pre-vision about the obligations that they were undertaking or the actual machinery that they would have to press into service for implementing this ambitious yet necessary welfare scheme. The Bill passed through the Union Parliament and put into operation in the first instance, at Kanpur and Delhi in February 1952. The Union Labour Minister who inaugurated the Regional Board at Madras on the 12th November '53 had to confess that the Corporation entrusted with the task of working the Act had no clear conception as to how they could extend it to other and more centres in India. The Act places the responsibility for providing medical treatment to the workers on the State Governments, which have naturally been fighting shy of taking it up, without having any concrete plans and an adequate idea of the financial commitments, which this as-yet undefined responsibility may entail.

The primary task before the Regional Board is therefore, to review the position so far as it concerns the Southern Region (with its centre at Madras) and ascertain how soon the scheme can be

extended to all industrial centres. There are, we are told, nearly, 3600 factories in the Southern region (which comprises Madras, Mysore, Hyderabad and Travancore-Cochin) and nearly 4,25,000 workers are employed in them. More than 50 per cent of this number are to be found in the Madras State alone and of these only 36,000 workers will benefit by the introduction of the scheme in Coimbatore. If the scheme is delayed in respect of the numerous other centres and workers, there is bound to be discontent and in all conscience it will not be fair to the numerous employers and employees in these other centres to be told to wait further.

The Madras State Minister of Industries and Labour, Shri Dr. U. KRISHNA RAU, who will be the Ex-officio Chairman of the Regional Board, stated that in the whole of the Madras State, there were 1441 employers and 2,22,283 employees and the implementation of the scheme at Coimbatore would affect only 100 employers and 36,000 workers. "The medical benefits proposed to be given at Coimbatore" said the Labour Minister "would consist of out-patient treatment in dispensaries, to be specially set up, free domiciliary visits where they are warranted, and in emergent cases, free hospitalization in recognized hospitals. All medicines would be given free of cost to the workers. In the case of maternity, ante- and post-natal care would be provided. The entire medical benefit is to be organized and provided by the State Government although a major portion of the cost thereof will be borne by the Corporation, Cash benefits would be paid by the Corporation through small local offices to be established by them in various localities where the Scheme is brought into force." As regards medical treatment whether the panel or the service system will be introduced Shri Dr. U. KRISHNA RAU was of the opinion that the service system was found to be more advantageous in Kanpur and Delhi. It would perhaps be better to associate private practitioners with this scheme, so as to ensure the full utilisation of all available medical personnel.

The Corporation and the Indian Medical Association have not come to any agreement in the matter of the fees payable to the doctor for each insured person. They have greatly differed on this point. The Indian Medical Association considers that the fee proposed by the Corporation was quite inadequate. Also there has been a difference of opinion with regard to the sickness rate and the absenteeism rate; and this will have to be settled amicably. Having for many years been President of the Indian Medical Association and sponsored at every step the claims of the profession to equitable treatment in various matters, Shri Dr. U. KRISHNA RAU naturally felt somewhat embarrassed as Labour Minister to administer this Insurance Act in a manner which, the members of the I.M.A. might feel was not to their advantage. At the same time he firmly believed that it would be possible for the Regional Board to convince the employers and workers of the *bonafides* of their intentions and to

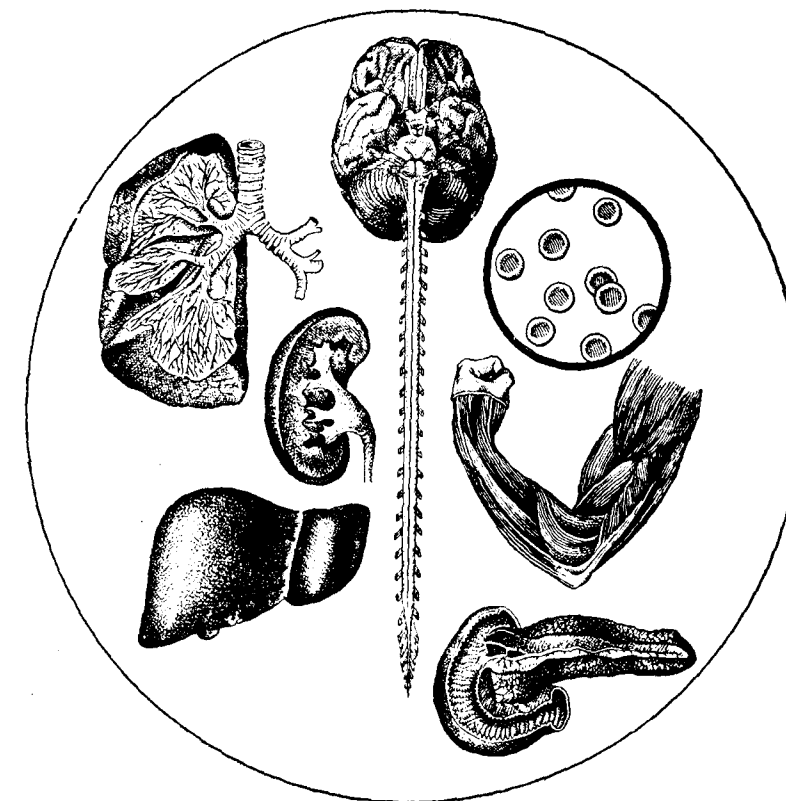
implement the scheme successfully. He was hopeful of being able to secure the help of his colleagues in the cabinet, in order to work the Act in a spirit of cooperation and harmony so essential for success. And we have no doubt, that with his long and mellowed experience of men and matters, the State Labour Minister will succeed in implementing the scheme in Coimbatore, and also extending it to other centres as soon as it is humanly possible. And we would earnestly request the medical practitioners, also to co-operate with him and the Regional Board in successfully implementing a much needed and long overdue programme of industrial welfare and social security, even if such co-operation meant some little sacrifice on their part. For, is not service to humanity the sacred aim of our noble profession?

Occupational Health Activities and Objectives of WHO

Dr. Roemer and Dr. Da Costa, Social and Occupational Section of the WHO, at Geneva stated "In advocating the active participation of health agencies in promoting industrial hygiene or occupational health, we do not mean that the task of factory inspection by labour authorities should be abandoned. Factory inspection involves much more than direct health supervision and must always be continued under the supervision of labour authorities who have general responsibility for the welfare of the worker. The prevention of accidents must be enforced through enforcement of safety measures by labour authorities. A well balanced Health Service, with preventive measures, pre-employment and periodical examinations, first aid, diagnosis and treatment of minor ailments, hospitalization for more serious ones, and health education is the goal which the professional leadership of health agencies can try to promote everywhere.

In its larger context occupational health service must be viewed as one aspect of the total question of health-care of a population, both preventive and therapeutic. The general pattern of organization of public health and medical care differs, of course, throughout the world. Among the older industrial nations of Europe, medical care has been most commonly organized under various insurance systems, which have been quite separate from the public health programmes and separate also from the systems of health service within the larger factories. In the United States of America, the same general development is now occurring some years later; Where public systems of social insurance for general medical care, are not in vogue, various programmes of comprehensive medical service for workers and their families are being organized by labour, and management in several industries. These specialised programmes are inevitable, because they are in response to definite needs. Yet problems are created by the dispersion of health programmes which, under separate auspices, affect different aspects of the same person, the same family and the same community. Eventually the hundred and one organized community approaches to preventive medicine and medical care must be coordinated into a total health service in each local area. It should be a co-operative service which considers each person as a WHOLE.

The WHO is thus interested in the total health of a person—in his physical, mental and social well-being—and makes a long term endeavour to strengthen the general health administration both national and local of all nations.—(*Indust. Hyg. and Occup. Health*, 7: 2, 1953).



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Gleanings From The Medical Press

MEDICINE AND THERAPEUTICS

Treatment of coronary disease.—
(*Proc. B.M.A. Annual Meeting, 1953*
B.M.J., 25-8-1953).

(1) *Treatment of the patient in hospital*:—Dr. Rae Gilchrist, of Edinburgh said that the three pain-producing syndromes of coronary sclerosis—namely angina pectoris, coronary insufficiency and acute myocardial infarction—overlapped and might on occasion be difficult to distinguish, yet the methods employed in their treatment could be sharply defined. The patient suffering from angina pectoris seldom requires hospitalization. In the patient with coronary insufficiency, if nitrites did not control the recurrent attacks, the other drugs such as khellin, papaverine and phenobarbitone might provide some protection. Cervical sympathectomy should be considered for the more resistant cases of angina decubitus. Acute myocardial infarction varied so greatly in its severity at the onset that its subsequent course was very difficult to predict and there was no alternative but to treat all hospital patients on the assumption that serious complications would occur. For this purpose, anticoagulants are the most effective remedy so far known. As soon as the diagnosis was established, the patient should be given morphine and from 10 to 15 thousand units of heparin, preferably intravenously. He had found 'Dindevan' given by mouth a safe and effective anticoagulant, though laboratory control would still be needed; 200 mg. a day gave a very steady prothrombin time level. Shock was more readily handled under hospital than home conditions and he had found digoxin useful in its treatment. It was generally wiser to send the patient at once to hospital than to move him, some days later when his condition might be more precarious. Ambulances should be equipped with oxygen and staffed by first-aid men trained in its administration. Complete immobility in bed should be discouraged as soon as shock and fever had abated. Chair-rest by the bedside might be

started within two or three weeks. Usually the patient with an infarction was kept in bed for six weeks and very gradually returned to duties. At the same time prolonged rest favoured thrombosis and rest might be over-emphasized.

(2) *Treatment in general practice*:—Dr. J. H. Hunt of London, dealt with the contribution which the family doctor could make to the treatment of coronary disease. In an emergency such as an attack of coronary thrombosis, the very sight of the doctor helped, and the sooner the doctor could see the patient the more confidence the doctor was able to impart. Emergency calls of this sort were really emergencies in nearly every case. The doctor would probably find on arrival, that the relatives had already given the patient brandy; sweet tea was perhaps better, but alcohol did give confidence. It was of the greatest importance to relieve the patient's anxiety and the assumption that he was going to get better must be conveyed to him as soon as possible.

Should the patient with coronary thrombosis be treated at home or at hospital? Much depended upon the doctor's personal assessment of matters administrative rather than medical. The speaker had seen many an old person made anxious, confused, or depressed by being moved away from his customary surroundings. One question commonly asked was about smoking. Not long ago he had a patient, a sea captain, who smoked 50 cigarettes on the bridge on ordinary days and 80 when there was a fog, but he was a strong-minded man and after an attack of the coronary thrombosis, he gave up smoking entirely. With many patients, however, this was more difficult and sometimes enforced abstinence from tobacco led to an undesirable increase in appetite and the consumption of large quantities of sweets. It was hard to believe that smoking even in great moderation always made coronary disease worse.

As for anticoagulant therapy, it was impossible more often than not to give this as a routine in the patient's home because of the difficulty in having control-tests performed, but he desired to see short-term anticoagulant therapy more used by the general practitioner. By no means are all cardiologists agreed on the necessity for anticoagulant therapy, and when experts disagreed, it was for the general practitioner to judge for himself.

Twenty years ago a diagnosis of coronary thrombosis was regarded as a death-sentence. Nowadays it was by no means so sinister, especially when it occurred in middle age. He had one patient who had had mild attacks of cardiac infarction at 55, 62 and 75 years of age and died at 82 from something quite different, 27 years after the first attack! The family doctor must be ready to assume some responsibility whatever the future held for this patient, and in coronary disease, no one could foretell the future. But the taking of responsibility was the fascination of general practice and the pride of the practitioner.

Value of primidone (Mysoline) in epilepsy.—(Whitty, C.W.M., *Br. Med. Jour.*, 5-9-'53).

Since the introduction of primidone (mysoline) as an anticonvulsant drug, two years ago, a report of its initial trial at the David Lewis Epileptic colony by Handley and Stewart (1952) showed that 12 out of 40 patients treated for a long time with other drugs, had complete abolition of all types of attack over the six month period of trial and a further 11 cases showed a reduction of two thirds or more. In another hospital for epileptics, 58 patients who had received extensive previous treatment were treated by Butter (1953) with comparatively poor results. During 15 months only 3 per cent had their fits abolished while 50 per cent derived some benefit. Whitty in the present paper records his experience of treating both symptomatic and idiopathic epileptics from the routine out-patient practice of a neurological clinic. 70 patients, 43 males and 27 females, whose ages ranged

from 4½ to 60 years were treated. Their response to other anticonvulsants had been unsatisfactory. 48 were idiopathic, 12 were traumatic and 10 were symptomatic. Thirty-one had grand mal, eight had mixed grand and petit mal, 10 petit mal only. 49 cases showed improvement and this occurred in all types of attack. In view of the usually poor response of psychomotor attacks to anticonvulsants, some improvement in eight out of 13 patients who continued the treatment is of special interest. Toxic effects are usually mild and transient. In five cases, they caused early cessation of treatment, in two probably unnecessarily. Dr. Whitty considers that mysoline is of some value in all types of epilepsy. However, the impression was gained that it is less useful in petit mal than in grand mal while the proportion of psychomotor cases which are improved is especially gratifying, since this type is usually resistant to other anticonvulsants. It may be that mysoline will find special application here; though more prolonged experience is required, because temporary improvement from any change of drug has so often been misleading in the past.

Apart from its anticonvulsant action, it seems to benefit the milder behaviour disorders, those angularities of conduct from which some epileptics seem to suffer. The relatively high incidence of these in the "temporal lobe epilepsies" suggests that neuronal circuits in this region may be especially implicated and that the drug may specifically act on these. Its evident though mild soporific effect, since this is shared with other anticonvulsants, cannot wholly account for the benefit.

The results reported here are the more striking, because this series is a highly selected one, most cases having failed to respond adequately to all the usual anticonvulsants. However, the absence of any serious toxic effects suggests that primidone should be given adequate trial as the drug of first choice in the routine treatment of epileptics.

A new adrenal compound.—(Br. *Med. Jour.*, Annotation, 5-9-1953).

Twenty-nine separate crystalline steroid substances have so far been isolated

from the chemical fractions of the supra-renal glands. Nearly all of them have now been synthesized during the last year or so. Seven of the 29 compounds have shown themselves able to prolong life in adrenalectomised animals and to prevent the occurrence of one at least of the major side effects of adrenalectomy. These seven compounds have, on assays of different kinds, shown considerable differences which are divided under the headings 'mineraloid' and 'gluco-corticoid' activity. The most potent of the latter is hydrocortisone and till now deoxycortone (DCA) has been the most active of the former. Corticosterone occupies a half-way position between these two. So far the two most potent gluco-corticoids, hydrocortisone and cortisone have been widely used in rheumatoid conditions.

Examination of blood from the supra-renal vein has shown that corticosterone and hydrocortisone are released from the suprarenal gland in amounts which make it very probable that it is these 2 compounds that are responsible for the normal adrenal carbohydrate metabolism. On the other hand, similar observations have not supported the original idea that mineralo-corticoid activity is principally regulated by DCA. It now seems that the steroid fraction which is principally responsible for the mineraloid activity of the normal gland is a new compound to which the name 'Electrocortin' has been provisionally attached by Simpson and Tart of the Middlesex Hospital Medical School. Since, however, this compound is contained within the "amorphous fraction" of the glandular secretion it has not been possible previously to investigate the effect of this fraction on the human or animal body.

On August 25, 1953, Professor T. Reichstein, who in 1951, shared the Nobel Prize for Medicine with Dr. P. S. Hench and E. C. Kendall, announced at the Eighth International Congress of Rheumatic Diseases held in Geneva, that he has been able at last to produce this substance in pure crystalline form. The process of crystallization is at present long and complicated and it will take some time, no doubt, before therapeutic trials of ELECTROCORTIN can be

started. The outlook is very promising, as from now on, the three main hormones of the normal adrenal cortex will be available in pure form and clinicians will be able to administer them in controlled fashion, varying the relative dosage to suit the needs of the body. They may thus be able shortly to reproduce the normal functioning of the adrenal cortex in those diseases, including the rheumatic group in which this form of therapy can be shown to be of major therapeutic importance.

Isotopic studies of potassium metabolism in diabetes—(*Jour. Clin. Invest.*, 32: 1, Jan. 1953).

It is well recognized that deficits of cellular potassium and hypokalemia may develop in diabetic patients under treatment for acidosis and coma. No data were available however, concerning potassium metabolism in less severe stages of diabetes in the presence of complication or in diabetics with intercurrent disease. Aikawa and his colleagues determined the exchangeable potassium content (Ke) by the radioactive isotopic technique in 42 unselected diabetic subjects. The initial Ke values were significantly lower in diabetic males than in normal female subjects.

Seven of the 20 subjects in whom serial determinations were performed showed an increase in Ke of more than 20 per cent. In general the control of the diabetes was poorer in these seven subjects than in the 13 remaining individuals who did not show an increase in Ke. The results suggest that the presence or absence of a potassium deficit in diabetes can be correlated roughly with the relative adequacy of control of the disease.

Heart pain and gastro-intestinal abnormalities.—(*Am. J. Digest. Dis.*, Jan. '53).

There are so many instances in which the cardiologist and the gastroenterologist are likely to disagree on a diagnosis that one scarcely knows where to begin his description. Otherwise expressed, an internist is almost daily confronted with the problem "are these symptoms arising above or below the diaphragm or indeed in the diaphragm itself?"

There is a medically popular feeling that when a patient complains of his stomach, his real trouble is in his heart and that when he blames his heart, his stomach is the real cause. Such a popular feeling possesses only one advantage—it keeps the internist in an inquisitive mood. The pain of coronary occlusion sometimes is referred chiefly to the epigastrium but the cardiogram usually makes the differentiation. In patients who are not very ill, substernal distress may be completely relieved by belching. Unfortunately, angina pectoris may exist in the presence of a normal cardiogram and a normal chest-film, and there is too much of a tendency now-a-days to brush off the diagnosis under such circumstances. Time and time again a patient with anginal symptoms but without X-ray or cardiographic abnormalities has dropped dead a few days after the initial examination.

Perhaps every one of us has been guilty of overlooking a diseased gall-bladder, which when finally removed, caused a complete cessation of the angina. The spastic colon itself is unquestionably capable of producing substernal pain referred to the left arm apparently as a result of gaseous distention and pressure against the diaphragm. Possibly the "splenic flexure syndrome" deserves special recognition in this connection.

Finally it should be stated that diaphragmatic hernia, hiatus hernia, eventration of the abdominal viscera, into the chest are not uncommon conditions but they are, unfortunately, usually overlooked, except by the well-trained roentgenologist. They are capable of producing substernal pain referred to the left arm especially after meals. In some cases at least they appear to induce a reflex but genuine angina pectoris.

The intravenous use of a combination of PAS and PVP in the chemotherapy of tuberculosis.—(*Am. J. Med. Sci.*, 225: 5, May 1953).

Though the potency of PAS as an antituberculosis agent is relatively low, its effect in delaying the emergence of resistant strains to streptomycin when both are administered together, is well

known. The usual dosage is large being 12 g. or more per day; it has to be administered orally in the ordinary course. Gastro-intestinal upsets often occur. Oral PAS results in relatively low blood and CSF levels which persist only for a few hours. Parenteral administration is indicated when (a) high blood concentrations are desired as in critical forms of tuberculosis; (b) high cerebrospinal fluid levels are desired as in tubercular meningitis; and (c) the patient is unable to take the required dose by mouth, as in the immediate post-operative period and in severe gastro-intestinal intolerance.

Large doses of PAS have to be given by intravenous or subcutaneous drip method and syringe injection of such large doses is very inconvenient and almost impossible in every case. French investigators Durel, and Pellerat *et al.*, (*J. des. Pract.*, 62: 273, and *J. de. Med-de. Lyon.*, 28: 641.) have discovered that the intravenous dose could be made smaller when PAS is combined with PVP (Polyvinyl pyrrolidone) without sacrificing high blood levels of PAS. PVP acts to maintain higher blood levels for a more prolonged period of time than is possible with an equal quantity of PAS alone.

Weiss, Seven, and Eisenberg of the Department of Chronic Diseases of the Chest, Philadelphia General Hospital report on a detailed study on 13 patients with clinical forms of tuberculosis which confirms the reports of the French workers. PAS—PVP is provided as a sterile light amber aqueous solution in 10 c.c. ampoules containing sodium PAS and PVP in concentrations of 25% and 3.5% respectively. The dosage was 10 c.c. for adults by syringe twice a day for a week. Seven of the 13 had tuberculous meningitis of whom six were either stuporous or comatose. The remaining six were patients with pulmonary tuberculosis who could not tolerate the PAS by mouth in adequate amounts, including one child of 20 pounds whose intravenous dose was 5 cc. twice a day and another child of 17 lbs. who got 2 c.c. twice a day. Controls received 25% sodium PAS alone. "PVP does not interfere with the tuberculostatic efficacy of PAS *in vitro*. PVP acts to

maintain higher and more prolonged blood concentrations of PAS and does not prevent PAS from passing into the CSF in adequate amounts. PAS-PVP has been used therapeutically for periods up to one week without any significant

toxicity. This preparation has the advantage that it may be given by syringe injections and smaller amounts of PAS are needed to establish high concentrations of the drug in blood and CSF.

OBSTETRICS AND GYNÆCOLOGY

The modern forceps operation.—During the plenary sessions of the Annual Meeting of the British Medical Association, held at Cardiff on the 15th July 1953, Prof. Jeffcoate of Liverpool opened a discussion on the place of the forceps in present day obstetrics. Their increased use in modern obstetric practice had not only improved the maternal results but had also effected a dramatic fall in the number of still-births and neonatal deaths attributable to the process of birth.

The increased safety of forceps delivery was due chiefly to four factors: (1) The disappearance of the high-forceps operation and the replacement of most difficult of mid-forceps extractions by caesarean section; (2) insistence on an accurate cephalic grip; (3) the application of forceps earlier in the second stage of labour, often before there is any evidence of distress; and (4) the prevention of maternal risks such as post-partum hæmorrhage and anaesthetic complications.

Despite the greatest care in selection of cases, unexpected difficulty, usually due to contraction of the pelvic cavity, occasionally confronted even the expert. There must therefore, be a place in hospital practice for a considered "trial of forceps," with resort to caesarean section in cases of failure. The proper place for forceps in modern practice concluded Professor Jeffcoate, was whenever they offered less risk to mother and foetus than did further prolongation of labour. These relative risks must be assessed in the light of the circumstances of each case, and this meant that in domiciliary practice, forceps should be applied only when the vertex was below the level of the ischial spines.

Failed forceps:—Dr. William Hunter (Newcastle-upon-Tyne) reviewed the

problem of failed forceps, a complication which was being less often seen as the standard of obstetrics rose. The three main causes were premature application, disproportion, and an unrecognised posterior position of the head. Premature application of forceps was most likely to occur when a doctor urged by the patient and her relatives to expedite matters in a prolonged labour, was tempted against his better judgement to apply forceps before full dilatation of the cervix. He himself considered that any woman whose delivery was not imminent after 36 hours in labour should be transferred to hospital, where it was easier to deal with the patient both as a woman and as an obstetrical problem, unembarrassed by her relatives. Again, a doctor, considering the cervix to be fully dilated, might find under anaesthesia that a rim of cervix was still present. He must then be strong-minded enough to abandon the operation than risk injuring mother and baby.

Disproportion was more likely to be overlooked when due to a large baby than when due to pelvic contraction. Ideally, the possibility of disproportion should be suspected antenatally, and if it was not excluded by bimanual examination, aided if necessary by X-ray pelvimetry, the patient should be admitted to hospital for delivery.

The third cause of failed forceps was the unrecognised occipito-posterior position. This malposition was much easier to diagnose antenatally, when it could be corrected abdominally by a manoeuvre he had recently described. Correction was also indicated when there was failure of progress in the first stage of labour and would probably then be followed by spontaneous delivery or low-forceps extraction. When the second

stage of labour exceeded two-hours or was marked by foetal or maternal distress, then, if the head was in the pelvic cavity, manual rotation of the occiput to the front, followed by forceps extraction was the treatment of choice.

Dr. E. Parry Jones (St. Asaph) discussed the methods of rotating the head before forceps delivery. Manual rotation within the pelvic cavity was the easiest and safest method. When it failed, the operator had to decide whether to displace the head upwards and rotate it above the pelvic brim or to effect rotation with forceps. The former manoeuvre involved the risks of prolapse of the cord and, if labour had been long obstructed, of the rupture of the uterus; it was a rational procedure only if the shape of the pelvis would allow

the moulded head to re-enter the pelvic cavity in its new position.

If forceps rotation was preferred, the classical instrument could be used with advantage only if the head was low and there was no bony obstruction at the level of arrest. Kielland's forceps were much better for the purpose, first because they were easier to apply accurately so as to grip the biparietal diameter without displacing the head upwards; secondly because rotation could be effected with little force and with a minimum trauma to mother and baby, thirdly because traction in the line of the handles was in the pelvic axis at all levels; and fourthly, because rotation, traction and delivery could be accomplished with only one application of the forceps.

BOOKS RECEIVED

The following books have been received with thanks since 16-11-'53 and the courtesy of the publishers in sending them is acknowledged. Reviews will appear in due course.—ED.

1. "Pharmacology and Therapeutics"—By Dr. M. A. KAMATH, M.B. & C.M., 1953. Kodiyalbil, Mangalore 3, Price Rs. 5/-.

2. "Operative Surgery"—By Dr. GUY W. HORSLEY, B.S., M.D., F.A.C.S.,

and Dr. ISAAC A. BIGGER, M.D., F.A.C.S., 1953. The C. V. Mosby Company, St. Louis. Price \$ 30'00.

3. "Surgical Pathology"—By Dr. LAUREN V. ACKERMAN, M.D., 1953. The C. V. Mosby Co., St. Louis. Price \$ 14'50.

4. Physical Medicine Series: Vol. II—"Respiratory Function Management in Disease"—By Dr. RICHARD D. TONKIN, 1953. The Actinio Press Ltd., London. Price 3/6 nett.

"Studies in Paediatrics"

By Dr. A. V. S. Sarma the author writes that the copies of his above booklet, reviewed in the August '53

issue of 'THE ANTISEPTIC' have been exhausted and the reprinting of the same for sale is under consideration.

NEWS AND NOTES

A New Scheme for Training of Health Assistants in Madras.

The Government of Madras has accepted a scheme of the Union Health Ministry for imparting training in diagnosis and treatment of diseases to candidates who have passed the S.S.L.C. Examination so as to qualify them to practise as Health and Medical Assis-

tants in rural areas, under the supervision of Registered Medical Practitioners. The Madras Government would include the necessary expenditure for this Scheme, under Part 'B' Scheme of the Budget for 1954-1955.

Candidates will be given 2 years' training in teaching institutions and hospitals and then allowed to work in

villages as stated above. Candidates will be paid a monthly stipend of Rs. 50/- during training. The proposal is that at the end of the training they should be offered employment under the Government for 5 to 10 years. This scheme was considered and approved by a Committee of experts consisting of the Director of Health Services, Madras State and the Vice-Chancellor of the Madras University.

Wales Medical College has been transferred to the Patna University; half of the recurring expenditure of the upgraded department will be paid by the State Govt. to the University annually, over and above the statutory grant, while the other half would come from the Union Government.

Medical Studies

Medical College at Patna (Physiology Deptt. to be upgraded)

Steps are being taken by the authorities of the Patna University for upgrading the Physiology department of the Prince of Wales Medical College at Patna. The upgraded department will admit students for the courses in M.Sc. and Ph.D. degrees in Physiology. The Union Government has made a grant of Rs. 55,000 for the purchase of equipments for the upgraded department. The Chancellor has recommended to the Senate the creation of a Post of Professor of Physiology on Rs. 1500-100-2000. The State Government would meet the cost of extension of the existing buildings and the Central Government would meet the cost of the equipment to be purchased; the recurring expenditure on the staff etc., to the tune of about Rs. 40,000 per annum will be shared by the two governments on 50:50 basis. A certain number of seats will be reserved for centrally sponsored candidates for post-graduate studies, to provide for equitable distribution among the states. The selection of research scholars will be made by the Union Government, with the help of a Central Selection Board on the basis of merit. The control of the Prince of

The Union Minister of Health proposes to prepare a panel of names of suitable candidates early in 1954, for fellowships for postgraduate training in medical and allied studies that might be made available by international and foreign agencies to Indian students during 1954. A Press Note issued by the Health Ministry says, "The candidates must be Indian Nationals who are in permanent service in Medical Colleges or their associated hospitals or in other medical institutions under the control of the Union Government, State Governments, local authorities, or the Government-sponsored voluntary organizations. Eligible candidates, who desire to avail themselves of the fellowships should apply on prescribed forms, though this State Governments, to the Ministry of Health New Delhi.

Sir David Campbell to Visit India

Sir David Campbell, Regius Professor of Materia Medica and Therapeutics at the Aberdeen University, has been invited by Britain's General Medical Council of which he is President to visit India and Pakistan in December and January, to discuss medical questions with the medical councils of these two countries.

PREPARATIONS AND INVENTIONS

Ascariasis and Oxyuriasis

Santonin which promptly attacks the parasites, is the anthelmintic of choice for these infections. Westminster Laboratories Ltd. of London have now brought out Santonin in Chocolate

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OBITUARY

The Late A. Rendle Short, M.D., F.R.C.S.

It is with deep regret that we record the death at Hereford on September 14, 1953 at the age of 73, of Professor A. Rendle Short, Emeritus Professor of Surgery in the University of Bristol.

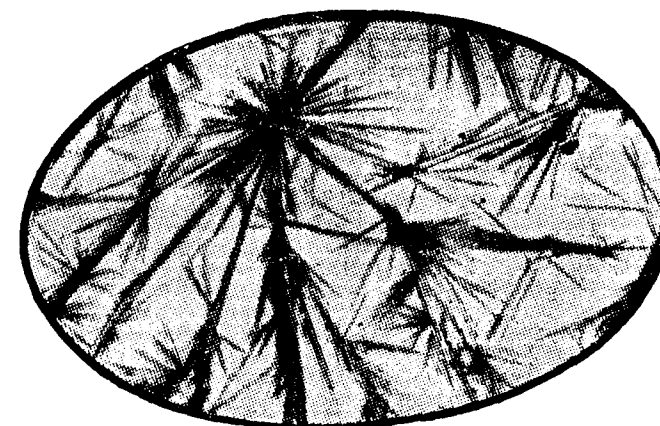
A melancholy interest attaches to the message of good wishes which the Professor sent us, just six weeks prior to his death on the 29th July 1953. He was one of our esteemed contributors and we look back with pride on his early contributions to the ANTISEPTIC, between 1910 and 1914 and also on the message of goodwill and congratulations which he sent us on the occasion of our "passing the quarter of a century landmark" in 1929.

Born in Bristol on 6th January 1880, the son of Mr. E. Rendle Short, a Director of Messrs. J. S. Fry and Sons Ltd., he had his education first in Bristol and then in the University College, London. He passed his M.B.B.S. examination in 1903, with flying colours, winning a scholarship and gold medal in Medicine and first class honours in Obstetrics. He took his M.D. in 1904 winning further academic distinctions and medals. He became a Fellow of the Royal College of Surgeons in 1908 and entered service as Surgical Reporter in the Bristol Infirmary. In about 5 years, he became a full surgeon at the Infirmary and also surgeon to Clifton College which post he held for 28 years. A Hunterian Professor of the Royal College of Surgeons of England in 1914—a rare honour attained only by a few very distinguished men in the profession—he was also an Examiner for the primary F.R.C.S. for sometime.

He took a keen interest in the affairs of the Association of Surgeons of Great Britain and Ireland, as a member of its Council. He occupied the Chair of Surgery at the Bristol University from 1933 to 1946 when he retired and was appointed Emeritus Professor. His surgical skill, backed by brilliance as a teacher and facile medical writer gave him a national and indeed world reputation. He had a *flair* for the exposition of amassed facts in a most orderly way. Medical publishers quickly realised Prof. Rendle Short's potentialities as an author and Messrs. John Wright & Sons, enlisted his services as a regular contributor to the *Medical Annual* in 1915 and as surgical co-editor in 1919—posts which he retained till his death.

To his able editorship is mainly due, the popularity and success of this valuable annual publication. He also wrote a number of useful books on medical subjects, chief among them being *The Causation of Appendicitis*, *The New Physiology in General and Surgical Practice*, *The Index of Prognosis and Results of Treatment* and his latest book *'Wonderfully Made'* (1951) which contains the reflections of his lifetime.

Professor Rendle Short died full of years and of honour and has left indelible imprints on the sands of time. He is survived by his wife, a son who is a doctor, and two daughters, one of whom is also a doctor and the other a nurse, to all of whom we extend our heartfelt sympathy in their sad bereavement. The ANTISEPTIC has lost one of its valued contributors and genuine well-wishers.



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

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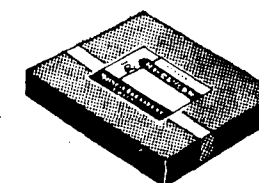
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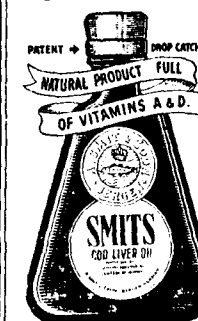
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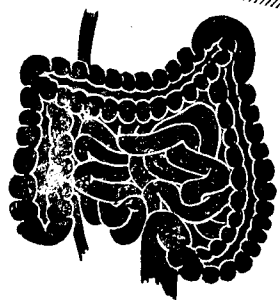
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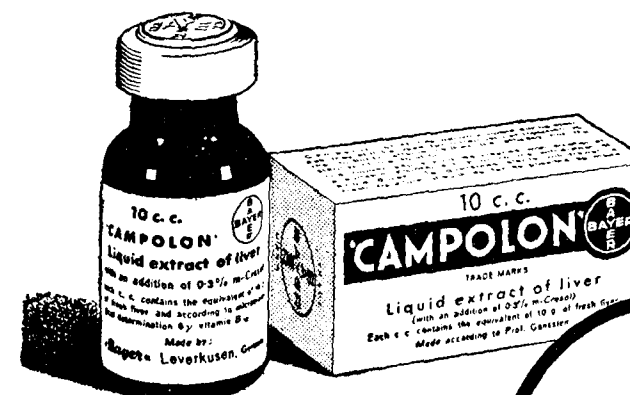
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K-SALT

. . . . will help to stay on his diet



K-SALT is a dietetic salt-substitute, having taste and flavour like salt, look like salt.

K-SALT contains :

NO LITHIUM

NO AMMONIUM

K-SALT is recommended in edemas of pregnancy, in congestive heart-failure, hypertension, arterio-sclerosis, and in obese persons under reducing diet. K-SALT is contra-indicated in severe renal disorders and oliguria.

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AMINOPLEXIN

(AMINO ACIDS WITH VITAMINS & GLYCEROPHOSPHATES)

Each fluid ounce contains :

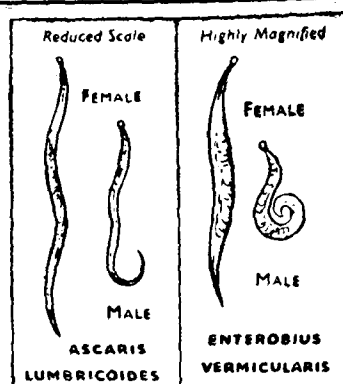
Amino Acids	.. 25%	Folic Acid	.. 4 mg.
Vitamin B ₁	.. 8 mg.	Vitamin B ₁₂	.. 10 mcg.
Vitamin B ₂	.. 2 mg.	Vitamin C	.. 50 mg.
Vitamin B ₆	.. 1 mg.	Calcium Glycerophosphate	.. 2 gr.
Niacinamide	.. 25 mg.	Sodium Glycerophosphate	.. 1 gr.
Calcium Pantothenate	.. 1.5 mg.	Potassium Glycerophosphate	.. 1/2 gr.
		Manganese Glycerophosphate	.. 1/4 gr.

Indications :

* Protein deficiency due to malnutrition and starvation * Typhoid, etc.
* Peptic Ulcers * Cirrhosis of Liver and other Liver diseases * Pre-operative and post-operative surgical management, etc. * Nutritional Oedema, etc., etc.

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Weight of each tablet: 31 gr. (2 Gm.)

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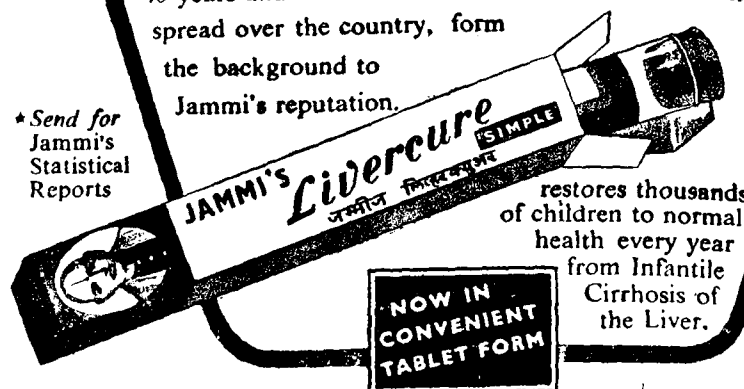
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0.8-9	0.14-3	1.6-9	Glaxo	Liver Extract Eng. 10cc	2.8	A.G. Jap Sap	0.9	0.13	1.2	2.4	3-8
0.8-6	0.13-9	1.6-0	Dumex	" with Vit B & C 10cc	30cc 5-0	" Ger "	1.0	1.6	1.14	4-0	
Procin 20lac	Dumex 2-15-6			" with Folie A 4-12 B ₁₂ 4-12		Record "	4.0	5-8	6-8	8-12	22-0
Glaxo 0-14-6; Dumex 0-13-6				" PD 2USP 3-12; 5 USP 7-12		" Boston	4-4	5-8	6-10	9-4	20-0
" Oily 30 lac x 10cc 4-13				" Bel. 2 USP. 2-12; 5 USP 3-14		LuerLock BD8-4	13-4	15-4	18-0	32-4	
" Lozenges 50 1-15	20 0-14			N.A.B. 30 0-11 45 0-13 60 0-15		Jap Sap	2-0	2-12	3-12	7-0	16-0
" tab. 12: 1/2 lac 1-14; 1/2 lac 3-10				Neosalvarsan 15 30 45 60		Re. 1-0 more for side nozzle.					
" Oint Eye 0-13	Skin 1-2			Pertussin 4-6 0-14 0-15 1-1 1-4		Metal Case Gripe Water W.W-2-3					
" and Strepto	Squibb 2-0			Nicotinamide 100x1cc B.W. 8-8		Ind. 1-4 1-12 2-8 3-4 5-12					
Streptocain 2-2 Ambistryn 1-14				Normal Saline 100 A 5 cc 3-8		Bakelite, 1-6 2-6 2-14 Lint 3-0					
Streptomycin 1 g. Pfizer 1-9				Santonine M&B 4-4 [10 cc 6-0		Eng. 3-8 Down 4-0 doz Record					
Merc 1-6-0; Gl 1-7; 1-6-0				Paludrin 2cc 5A 3-0 25A 11-4		" 4-8, All Glass					
" with P.A.S. Lepetit 3-3				Redoxon 2cc 6 4-12; 50 36-0		USA 6-0 Jap 2-8; B.D. 10-8					
Isonicotinic Acid Hydrazide				" 3x5cc 4-6; 25x5cc 27-12		Thermometers 1/2 min. Hicks 3-4					
100 1-14; 500-7-4; 1000-14-0				Vit B ₁₂ 5cc 50M Glaxo 3-12		Zeal Eng. USA Jap. Sup. Flat					
Isonex DMX 30 1-3; 100 2-10				" Bel. 10 cc. 3-14 100M 5-14		27-12 15-0 13-8 8-4 8-12 16-0					
Chloromycetin 12 kap 17-0				" B Comp. 2-4 TCF 3-4		Beacon in case with clip 3-6					
" Liquid 12 10-8				" K 100 A 21-0		Erkameter 69-0					
Chloramphenicol 12 cap 10-8				Acid Nicotinic 500 1-10		Diagnostic Set Cowland 3003 90-8					
Aureomycin 8 cap 19-0				Aspirin 100 0-14; 1000 4-4		" 3007 big 165-0 [500cc 10-8					
Terramycin 8 17-4				Atebrin Bayer 15 0-9; 300 5-10		Salin app. comp. 300cc 7-8					
P.A.S. c Cal 100 3-10; 500 15-8				Bedavit tab. 250 2-0		Abs. Gauge 20yd x 20 3-12					
" Tab 100 3-4; 500 14-12				A.P.C. 1000 12-0 [6grm 1000 10-0		Bandages 3 1/2 yd. x 1"-6" 0-8					
" 100 grm German 5-8 DMX 6-0				Camoguin 1000 119-0; 3 0-9-9		Ear or Glycerine Metal Syringe					
" Italy 100 g 3-14 Comber 7-2				Di-Methionine USA 40 5-8 100 10-4		2oz 5-0 4oz. 6-0					
P.A.O. 250 14-12; 1000 51-14				Ephedrine Hyd. 1/2 100 1-2 1000 4-15		Disp. Scale Nickel 5-4 Brass 4-0					
Quinine Japan 42-14 Java 48-12				Cibazol 20 1-10; 250 13-4		Elasto Plaster 2 1/2"x5yds 2-12					
" 3-3: Howard 4-6 oz.				Soda Mint 1000 2-0 Eng. 3-8		" 3"x6yds 3-8					
" Roche 55-12 Howards 59-12				Mepacrine 1000 I.O.I. Boots 9-8		Flaxo Plaster 1" x 3 yd. 0-8					
" Tab 2gr 3-14 5 gr 6-0 How.				Folic Acid 5 mg 100 14-14		Leukoplaster 2 1/2"x6yds 1-10 tin					
" Howards 5gr. x 1400 67-8				Hetragen Lederle 1000 130-0		" 3"x5yds 2-4					
" Bihyd. 2 gr 4-0 5 gr 6-0				Multivitamin coated 1000 18-4		F.L. ord. 1-8 Sup. 2-8 doz.					
Equinine Jap 5-0 German 6-8				Paludrin 1000 1g 20-4 3g 51-8		" Crocodyl finish 5-8 "					
[Howards 7-4; Java 7-4				Bismuth Carb 4grx500 tab 3-14		Stethoscope B.D. 20-0; Ger. 11-12					
Quin. Bihyd. 100 x 10 gr x 2cc				Laxative Vegetable Plain		Wall Thermometer Jap. 2-12					
Ind. BDH Evans B.W. P.D.				Pot. Chloras 1000 6-12 [1000 5-8		Vit. C 1000 13-4 100 3-4					
10-8 23-0 30-0 33-0 49-14				Resochin 10 1-12; 100 13-14		Vit. B Complex 1000 USA 17-4					
9-0 15-8 5grx1cc 100amp				Saridon 10 1-7; 250 25-4		" B ₁ 10mg, 1000 24-0 100 3-0					
Acetylarsan adult 6-6 Child 4-12				Sulphanilamide 1000 10-4		Artery Forcep 2-4 Scissors 2-0					
Atophanyl Germ IM or IV 5-2				" Guinadine 1000 15-14 500 8-0		Scalpel 1-12 Probe 0-6					
Atebrin 3g 25 14-12 1g 50 23-12				" Boots 500 8-0		Tongue Depressor 1-4 folding 2-4					
Bedavit 1 mg 50 amp 1-12				" Diazine 100 10-8 500 37-12		Tooth Forcep Universal 4-4					
Berin 10cc 50mg 3-2 100mg 4-5				" Mezathine 500 28-8 100 6-10		Menthol 2-6 [USA 6					
Caloil Ostelin 3-3 15cc 6x1cc 3-0				Sulphamezathine amp. 25 3-8		Ext Ergot Liqd. 4oz 3-4 Eng 8-8					
Campher-in-oil 12A 0-12 100A 5-12				" Thiazol Boots 500 19-8		Oil Chinapodium oz 4-10					
Campolan 2cc 5 5 8 100 102-0				M & B 693 25 2-2; 500 39-12		Aletis rio 9-8 Eng. 2-0					
Calcium Gluconate 10% 100 amp				" 760 25 1-12; 500 26-14		Himrod S.A. Cure 4-12 Vibex					
5cc 10-0 10 cc 12-0				" Nivaquin 10 1-12; 500 58-8		Peacock's Chionia 8-0 [4oz 4-14					
" Sandoz 5x10cc 5-4 10x5cc 8-12				" Sulphaguinadine 500 12-4		Sawmetto 8-4 Livibron 6-4					
" with Vit C 10x5cc 10-14				" Sulfadiazine 500 41-14 25 2-12		Aspirin 3-12 Sod Salicylas 3-12					
5x10cc 6-8; 50x5cc 49-14				" Sulphatriad 100 8-8 25 2-4		Evans Throat Pastilles 1-8					
Distil Water 100 amp 2cc 3-0				Sulphetrons 100 10-0; 500 43-0		Totaquina pow Eng. 1b. 24-0					
5cc 3-12; 10cc 4-12				" amp 100 140-8 6 amp 10-0		Diodo-hydroxyquinolin 25 2-2					
Emetin Hyd. 1/2 12amp Thilo 6-0				Santonine & Calomel 100 5-8		Trinitine 1/100 gr. 100 1-12					
BDH 7-8; B.W. 8-8; P.D. 6A 6-4				Yeast Tab 1000 5gr 4-4 7 1/2gr. 6-12		Mixed Gland M. or F. 100 2-0					
Emetin 1gr 12A. 11-14				Sulphaguinadine pow 1b 13-4		Voice Tab 100 3-0					
Emetine 1grx6amp P.D. 9-0 BW 7-12				Soda Salicylas tab 1000 8-12		Soda Citrate 1002gr. 1-4 5gr. 1-14					
Emetine 50A 1gr 21-8; 1gr. 39-8				S.S. Cod Liver Oil 5-2		Little Liver Pills Eng. doz. 7-8					
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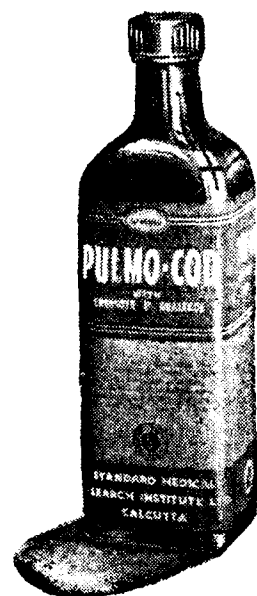
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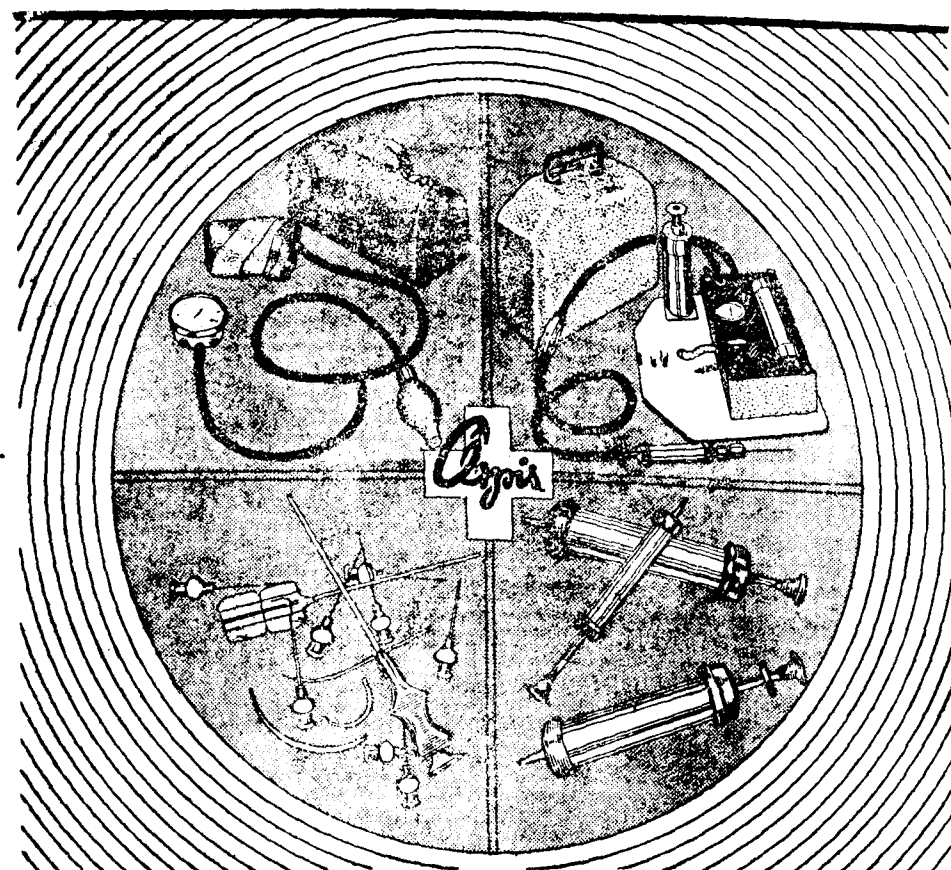
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„ 0-8-6 0-13-9 1-6-0 Dumex	Resochin tab 10 1-12; 100 13-14	„ BW „ c Atropine 1 gr x 20 4-0
Dihydro Strepto 1gr Pfizer 1-8-6	Yeast Tab. Eng. 5gr 4-8; 7gr 5-4	Ind. Morph Sulph 1gr 12 amps 5-8
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„ Dumex 3-0	„ nilamide Eng. 10-0 5-2	„ W. Liver Ext. 10 cc 3-0
„ Dumex Pf. Gl. Squibb	„ guindine 15-0 7-12	„ „ „ c O & B 10cc 4-4
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30 lacs Oily Merck 4-8 Pfizer 6-2	„ thiazole, Ind. 16-12 „ 19-4	Thermometer Germ. 1-0 Jap. 0-11
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„ 1 oz Jap. 3-4; Howds 4-6	Santonin Synthetic German	A.G. Jap. 2 5 10 20 30cc.
„ 1 oz Jap. 3-4; Howds 4-6	1 dr. 2-12; 1 oz. 17-8 [3-12	0-9 0-13 1-2 1-0 1-14
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„ Ind. B.D.H. B.W. P.D.	Potas Chloras 1lb. 3-0; tab. 1000 6-8	Germ. 1-0 1-1 1-14 2-8 6-8
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Published on the 15th of Every Month

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

Proprietary: Dr. U. KRISHNA RAU, M.B., B.S., M.L.A.

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

Editorial and Publishing Office: 323-24, Thambu Chetty Street, Madras-1.

Calcutta: 31, Beck Bagan Row. Bombay: G.P.O. Box No. 1613. New Delhi: G.P.O. Box No. 677.

London Office: 24.27, High Holborn W.C. 1.

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Editor: U. VASUDHANA RAU, M.B., B.S.

Editorial & Publishing Office: 23-A, Thambu Chetty St., Madras-1.

London: 24/27 High Holborn W.C. 1

Calcutta: 31, Bank Bagan, Bow

Telegrams: "ANTISEPTIC"

Telephone: 2163

New Delhi: G.P.O. Box No. 677

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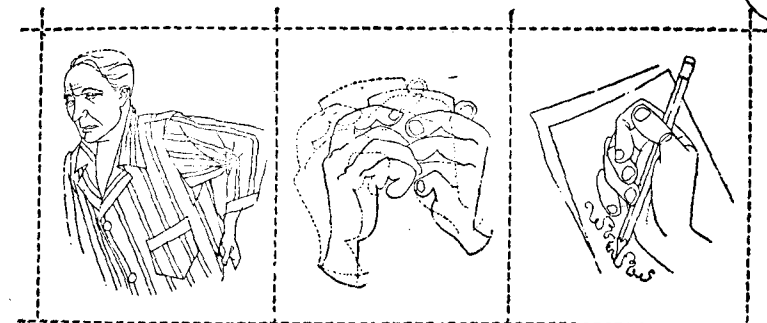
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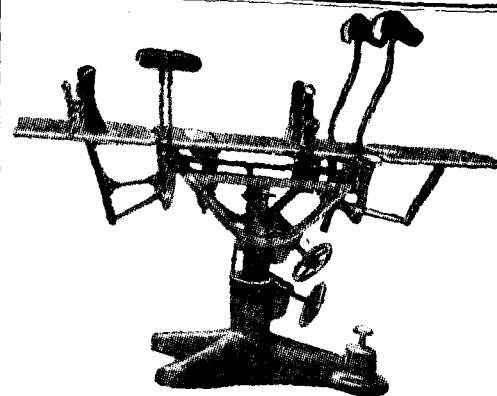
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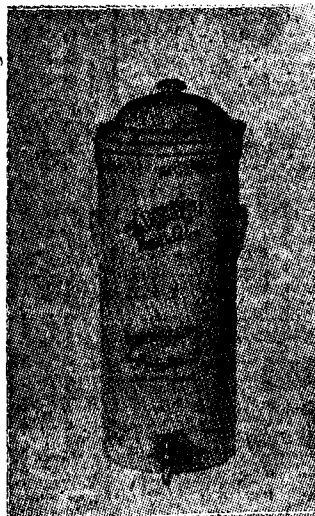
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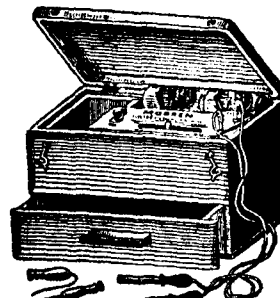
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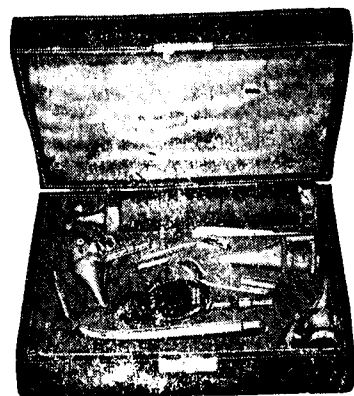
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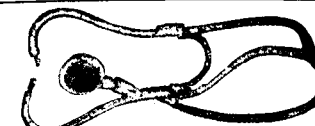


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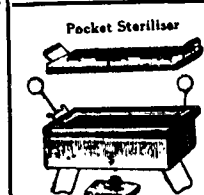
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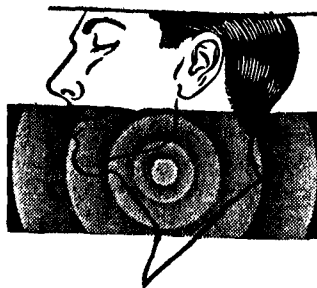
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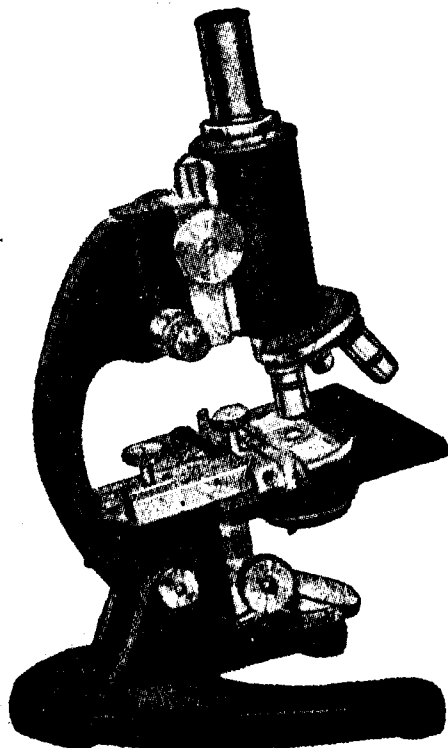
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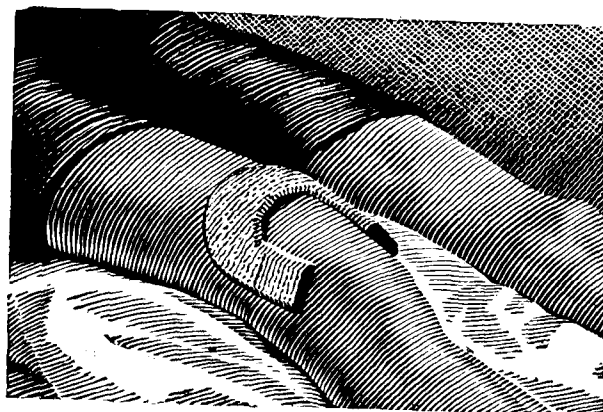
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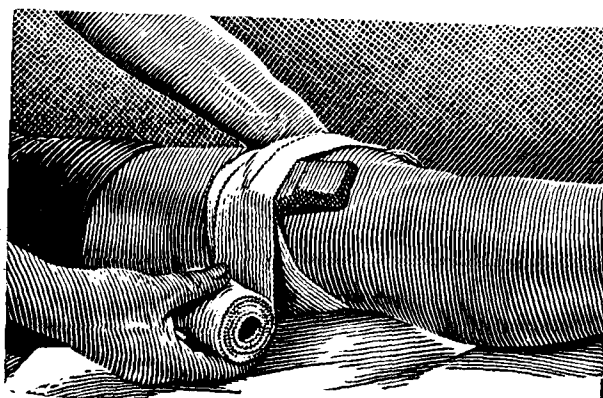


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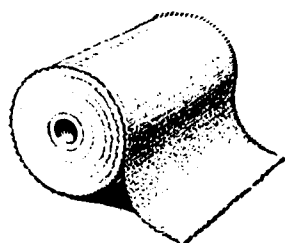
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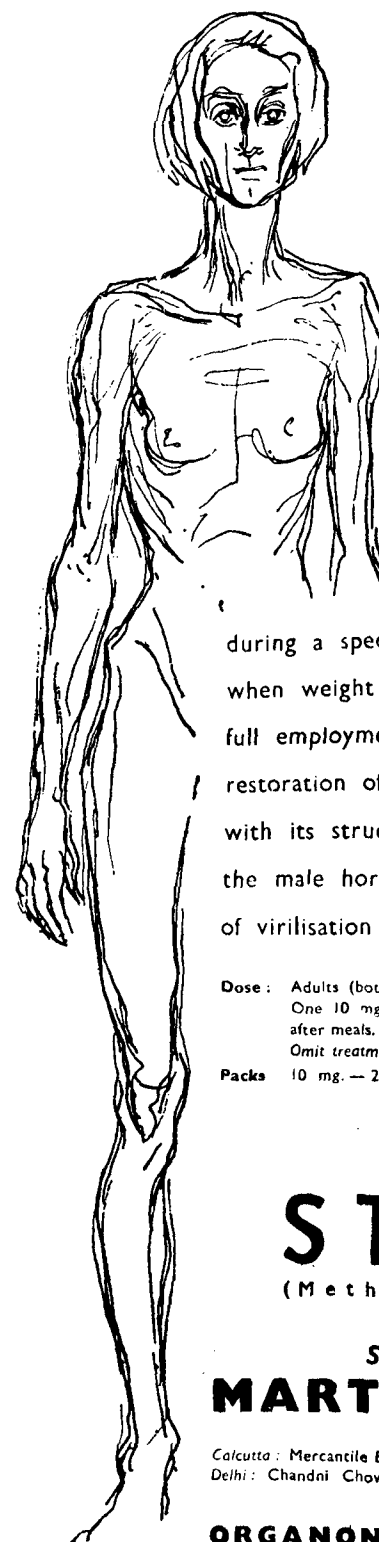
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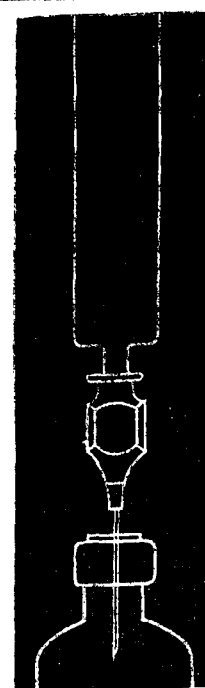
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Sole Importers: **NEO-PHARMA Limited, Kasturi Buildings, Churchgate Reclamation, Bombay 1**

Prepared for infants' special needs ...



Made by Nestlé's world wide manufacturers of milk products, with a reputation of over 80 years, Lactogen is modified especially for infant feeding.

The composition is strictly uniform, and by homogenization, the fat globules are made even smaller than those of human milk, facilitating digestion, while pasteurization has ensured the removal of pathogenic organisms.

Lactogen is also suitably fortified to provide adequate (but not excessive) intake of essential Vitamins A & D & Iron, based on standards recommended by the National Research Council, Washington.

LACTOGEN

"THE BETTER MILK FOR BABIES"



NESTLÉ'S PRODUCTS (INDIA) LTD. P.O. BOX 396 CALCUTTA. P.O. BOX 318 BOMBAY.
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In confidence...

Even in these enlightened days, guidance on methods of family planning can do much to remove anxiety and promote a patient's mental and physical well-being. Gynomin entirely fulfils the requirements of a modern contraceptive and may be accepted with confidence.



- Spermicidally efficient
- Clean in application—non-greasy
- Harmless to health
- Keeps perfectly in all climates

Formula No. C D L 1040

GYNOMIN

The scientifically balanced antiseptic and deodorant contraceptive—in tablet form

Medical Literature and samples on request

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NATURAL Ephedrine Assures Instant Relief from Asthma...

Conforming to B.P. standards, Marker Alkaloids' Ephedrine Hydrochloride is a pure natural product made from Ephedra Herb and is highly effective in the treatment of respiratory disorders marked by obstructive or difficult breathing. In containers of 100, 500 and 1,000 of $\frac{1}{2}$ grain, $\frac{1}{4}$ grain and 1 grain tablets. Pure Natural Ephedrine Hydrochloride crystals in 1 oz., 4 oz. and 1 lb. packing.

Sole Distributors in India:

J. L. MORISON, SON & JONES (India) LTD.

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MARKER ALKALOIDS

QUETTA

MANUFACTURERS OF PURE DRUGS & FINE ALKALOIDS FOR THE MEDICAL PROFESSION

diet in surgical cases

Horlicks possesses characteristics which make it especially valuable as a diet in surgical cases. Some nutritional disturbance is unavoidable in surgical operations, but this can be reduced to a minimum if due regard is paid to pre-operative diet. It has been proved that surgical patients make better progress if their glycogen reserves are adequately maintained. Horlicks helps towards this; the toxicity due to anaesthesia is lessened, the risk of post-operative vomiting is reduced.

Horlicks has a pleasant flavour which overcomes distaste for food and its balanced nourishment materially assists recovery. It has a soothing effect which promotes restful sleep.

HORLICKS

PRESCRIBED WITH CONFIDENCE FOR OVER SEVENTY YEARS

HL 377

Chronic Constipation

A FUNDAMENTAL ADVANCE IN TREATMENT

"In a recent preparation, 'Senokot', the manufacturers have succeeded in eliminating all the disadvantages of senna while preserving its well recognised advantages... It is a valuable ally in the cure of chronic constipation as well as an aperient for occasional use, and it appears to have no contraindications."

The Practitioner, March 1953

Senokot

Is not advertised to the public, has no official equivalent and may be prescribed
Senokot is patented in Great Britain and in other countries. The name is a registered trade mark.

SENOKOT Granules are available in 2 oz. tins:

(approximately 26 teaspoonsfuls)

A product of



WESTMINSTER LABORATORIES LTD., CHALCOT ROAD, LONDON, N.W.1.

Agents: **ORIENTAL MERCANTILE AGENCY, 99-A, Armenian St., Madras.**

The Body's Emergency Fuel!



WHATEVER the cause of fever, Glaxose-D conserves the patient's strength. It reinforces the effects of any specific treatment advised by the physician and thus materially helps to hasten recovery. Glaxose-D provides glucose, the substance from which body-energy is itself created and which the muscles burn in doing their work. Calcium, phosphorus and vitamin D are also combined in Glaxose-D, to steady the nerves and restore muscular tone. Pleasant to take from the spoon or mixed with food or drink, Glaxose-D has been aptly termed the body's "emergency fuel."



Available in 1-lb. and ½ lb. containers only.

GLAXO
GLAXOSE-D
(GLUCOSE-D GLAXO)

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



PREPARING FOR

Motherhood

Motherhood is an important time in a woman's life. Upon the doctor and the pre-natal care given, depend the health of the baby, the ease of delivery, and the mother's speedy recovery to normal health.

By prescribing 'Ossivite' you provide the expectant mother with adequate amounts of Calcium, Phosphorus and other essential minerals upon which there is a constant drain during pregnancy.

'Ossivite' ensures the mother against pre-natal cramps, prevents the mother's teeth from decaying and helps considerably towards the bone formation of the baby-to-come.



'OSSIVITE'
TRADE MARK

CAPSULES
NATURAL CALCIUM
WITH VITAMINS A & D

Also available in granules

JOHN WYETH & BROTHER LIMITED, LONDON

Distributors in India and Burma: GEOFFREY MANNERS & COMPANY, LIMITED



HI-NUTRON

restores nitrogen equilibrium

The negative nitrogen balance in illness leads to breakdown and excretion of body proteins like those of the muscles; the patient gets thinner every day.

HI-NUTRON restores the nitrogen equilibrium preventing waste during illness and aiding convalescence.

HI-NUTRON contains the protein 'Myosin' which provides all the essential amino acids. Ampoules of 5 and 10 cc.

HIND CHEMICALS LTD, KANPUR.

At Your Service



Indications: Infantile liver: Hepatic obstruction with dropsy: Tropical congestion of liver: Intestinal troubles during dentition: Summer diarrhoea: Post-natal anorexia with gastro-intestinal irritation. and diarrhoea: Anasarca: Jaundice.

Composition: Andrographis Paniculata (Kalmegh) Hygrophila Spinosa (Kuliakhara) Luffa Bindal (Ghosalata) Ptychotis (Jowan) and other Cholagogues and Carminatives. Retains full efficacy in both Acid and Alkaline mixtures.

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FOR LIVER AND STOMACH
THE O.R.C.L. LIMITED • SALKIA • HOWRAH

To Normalise **MENSTRUAL ABNORMALITIES**

OF VARIOUS KINDS FROM
FUNCTIONAL & GLANDULAR
DISORDERS

Re

HORMOSOKA

Contains
ASOKA

PERFECT
CYCLE

GLAND EXTRACTS
OF ANT. PITUITARY
THYROID & OVARY.

VEGETABLE LAXATIVE, DECONGESTIVE,
ANTISPASMODIC, SEDATIVE & TONIC

BIRLA LABORATORIES CALCUTTA

Ergoapiol-(Smith)

A Menstrual Regulator . . .

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

In cases of Amenorrhea, Dysmenorrhea, Menorrhagia and Metrorr-

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

DOSAGE: 1 to 2 capsules 3 or 4 times daily. Supplied only in packages of 20 capsules. Literature on request.

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

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


B₂ **B₆**
B₁ **VITAMIN** **B₁₂**
B-COMPLEX
 (INCLUDING VITAMIN B₁₂)
 ORAL — LIQUID

A standardised palatable vitamin tonic derived from natural sources, i.e. rice and wheat polish, germinated pulses and healthy sheep liver. Supplemented with synthetic vitamins.

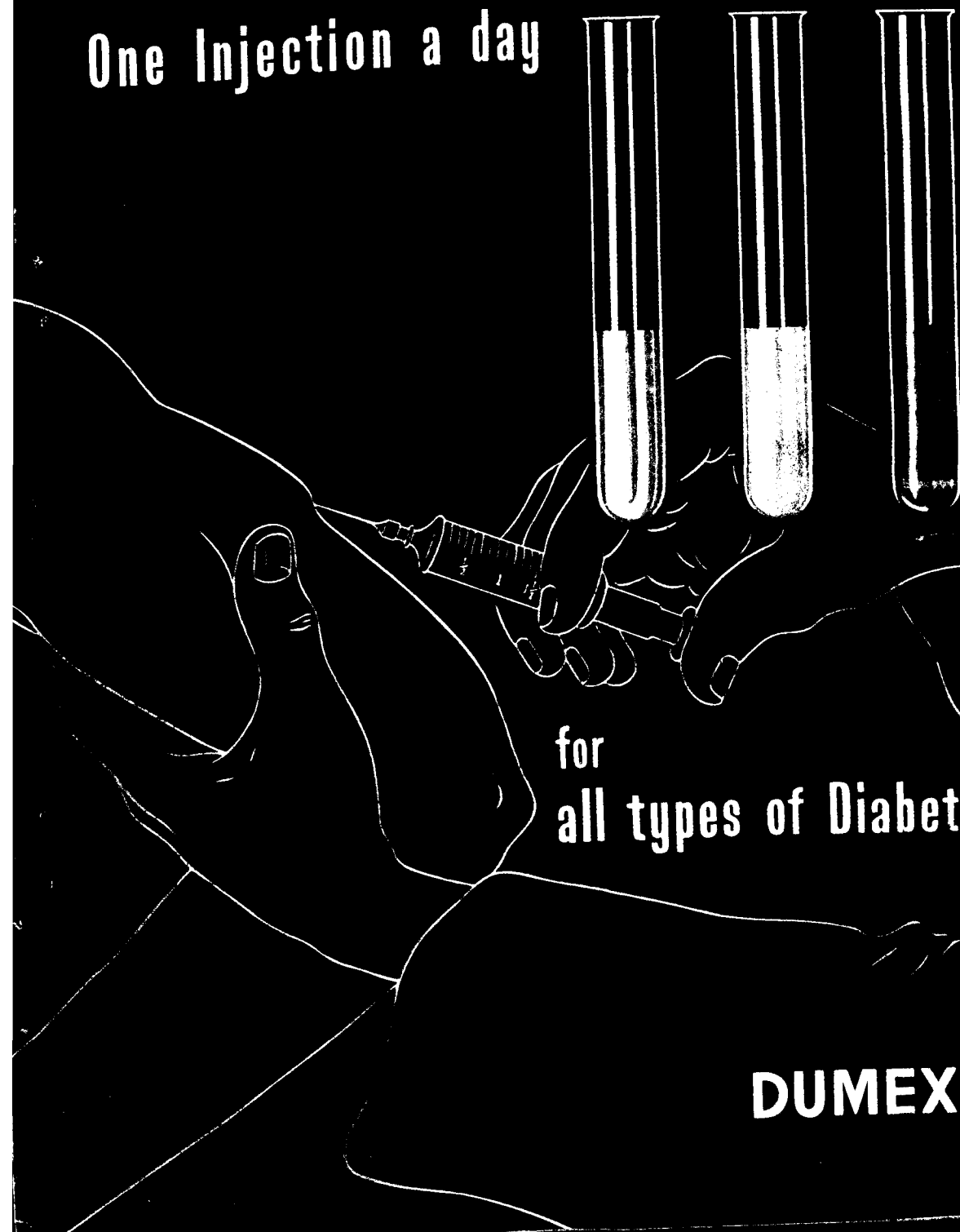
ORAL — LIQUID: In bottles of 100 c.c. and 185 c.c.

NICOTINIC ACID AMIDE
 METHIO-NINE
 CHOLINE CHLORIDE
 SOD. GLYCERO-PHOSPHATE

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Insulin-Novo-Lente

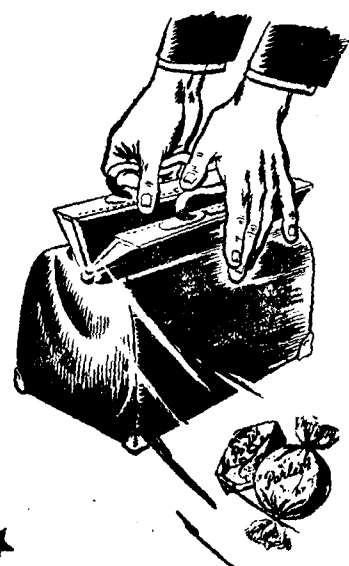
One Injection a day



for
all types of Diabete

DUMEX

The Doctor opened his bag....



**AND A COUPLE
OF *Parle's* SWEETS
DROPPED OUT !**

A doctor's time is not his own. He has often to skip a meal or have a sleepless night. He knows that Parle's sweets are rich in Glucose and have Vitamins added in good measure. Which is why he finds it necessary to enjoy a couple of Parle's sweets on his way to a visit.

★ LABORATORY REPORT

Parle's sweets were recently analysed by the Hoffmann-La Roche Laboratories in Switzerland and here is the Report dated 10-6-'52 :

Vitamin B₁ . . . 0.17 mg. per ounce
Vitamin B₂ . . . 0.32 mg. per ounce
Vitamin C . . . 6.00 mg. per ounce



Parle's
SWEETS & TOFFEES
★ ENRICHED WITH VITAMINS

Insulin Novo Lente

DUMEX

Intensive clinical investigations have proved that with the preparations, Insulin Novo Semilente, Insulin Novo Lente, and Insulin Novo Ultralente, it is possible to balance diabetes satisfactorily on one daily injection in the great majority of cases. Thus, 80 per cent of severe cases of diabetes have shown a good blood sugar adjustment on one daily injection of Insulin Novo Lente. As all mild cases of diabetes can be adjusted satisfactorily on the preparation, this means that 85 to 90 per cent of the Insulin using diabetics can be adjusted satisfactorily on one daily injection of Insulin Novo Lente. Consequently, Insulin Novo Lente is a chosen

preparation, but it is possible that in some few cases its action will be too rapid or too slow. For such patients Insulin Novo Ultralente or Insulin Novo Semilente may be mixed with the Lente preparation to prolong or shorten the latter's range of action or they may be administered alone. While the Lente preparations are mutually miscible, any one of them must not be mixed with other Insulin preparations as this can cause chemical alterations which will make the mixed preparation unstable and its effect incalculable. The new Insulin preparations will be included in the next addendum of the British Pharmacopoeia.

FRESHLY DIAGNOSED CASES

PREVIOUS THERAPY: NIL

- (1) Control with Crystalline Insulin in the usual manner
- (2) Determine total daily amount of Crystalline Insulin required for maintaining control

If 60 or less units

e.g.: 10 I.U. 8 a.m.
20 I.U. 2 p.m.
20 I.U. 8 p.m.

Insulin equivalent as Insulin Novo Lente 8 a.m. i.e. in this case 50 I.U.

If more than 60 units

e.g.: 20 I.U. 8 a.m.
40 I.U. 2 p.m.
40 I.U. 8 p.m.

1st day

Insulin Novo Lente 60 I.U. 8 a.m. Crystalline Insulin—Balance (in this case 40 I.U.) as separate injection at 10 a.m. or other suitable time.

2nd and each subsequent day

Increase amount of Insulin Novo Lente given at 8 a.m. by 4 I.U. per day (in this case 64-68-72 etc.) & decrease amount of Crystalline Insulin given by separate injection (in this case 36-32-28 etc.) until total requirements are met by Insulin Novo Lente alone (in this case 100 I.U.)

OLD CASES

Previous Therapy: Retarded Insulin in 2 daily injections
Total daily requirements

0 units or less
as Insulin Novo Lente 1 injection at 8 a.m.

More than 60 units

1st day

Insulin Novo Lente 60 I.U. 8 a.m. Balance as previous preparation by separate injection at any suitable time

2nd & each subsequent day

Increase amount of Insulin Novo Lente by 4 I.U. per day & decrease amount of separate injection by 4 I.U. per day until total requirements are met by Insulin Novo Lente alone

Previous Therapy: Retarded Insulin in 1 daily injection

Equivalent as Insulin Novo Lente 1 injection a day at 8 a.m.

FURTHER ADJUSTMENTS

After the Insulin requirements of the patient have been met by Insulin Novo Lente alone, the injections should be continued for a period of 3-4 days.

Thereafter, it should be determined by blood sugar estimations whether satisfactory control has been established, or, the following method of control, which can be generally adopted, should be followed:

24 hour urine is collected in two portions:

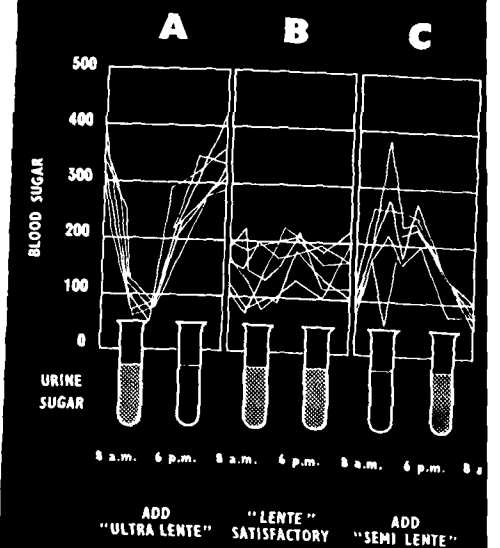
- (1) from 8 a.m.—6 p.m. "Day"
- (2) from 6 p.m.—8 a.m. "Night"

If both day & night urine are free of sugar-satisfactory control has been established and Insulin Novo Lente should be continued (see B alongside).

If day urine shows sugar, while night urine is free of sugar, a quicker effect is desirable which can be obtained by adding Insulin Novo Semi Lente in a proportion of 1:1 or 1:2 or any suitable proportion (see C alongside).

If on the contrary, night urine shows sugar, the addition of Insulin Novo Ultra Lente (slower effect) in the proportion of 1:1 or as desired, will bring about satisfactory control (see A alongside).

Patients on Insulin Novo Lente 1 daily injection

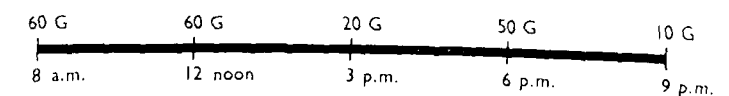


DIET

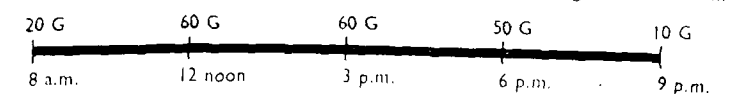
As with any "one injection a day therapy" it is necessary while using the Lente preparations to spread the carbohydrate over many meals. The following diet is suggested for general use.

Calories	2000
Proteins	70 g
Fats	100 g
Carbohydrate	200 g

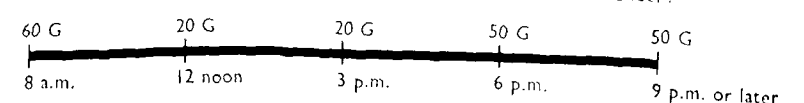
which should be distributed as under:

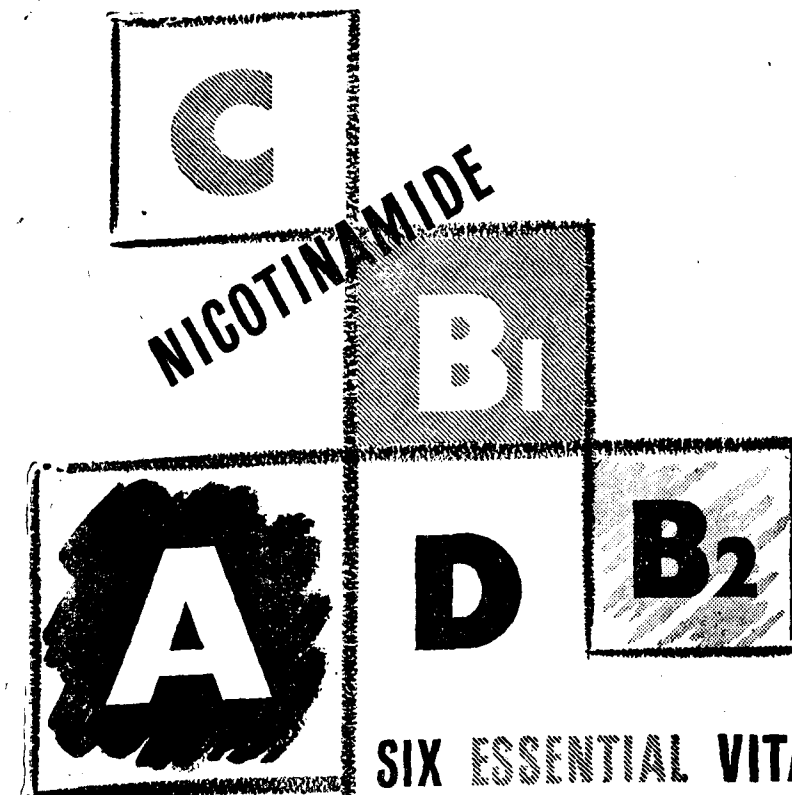


By an adjustment of the Carbohydrate distribution between the different meals, hypoglycaemic tendency may be avoided. Thus, in patients showing this tendency at 5 p.m., the following distribution will be useful:



or, if the tendency appears on waking, the distribution should be as under:





SIX ESSENTIAL VITAMINS

In primary and in secondary deficiency, more than one essential factor is usually lacking, making it imperative that vitamin therapy should treat all such deficiencies simultaneously. 'Kepler' Multi-Vitamin Capsule, providing essential vitamins in a balanced formula, is specially suitable for

Scurvy	Dental caries	Anorexia
Rickets	Nutritional oedema	Neuritis
Beriberi	Intestinal atony	Infantile tetany

'Kepler' Multi-Vitamin Capsules are prepared to the same standard of pharmaceutical care and precision that has made 'Kepler' Cod Liver Oil with Malt Extract known and respected by the medical profession throughout India.

'KEPLER'
BRAND
**MULTI-VITAMIN
CAPSULE**



Made in England by The Wellcome Foundation Ltd. for
BURROUGHS WELLCOME & CO. (INDIA) LTD., BOMBAY

ATHOMIN,

A drug of choice, producing both sympathomimetic and antibacterial action.

ATHOMIN is highly effective in CHOLERA, NON-SPECIFIC DIARRHOEA, BACILLARY DYSENTERY, CHILDREN'S DIARRHOEA, ULCERATIVE COLITIS, SEVERE FOOD POISONING etc.

ATHOMIN stops effortless vomiting almost immediately and modifies the character and the frequency of purging quickly.

ATHOMIN has its stimulating action on the bile-expelling mechanism and activates the liver by reducing the load of accumulated bile. It slightly raises the temperature in collapse condition and improves the volume of the pulse by the action on the efferent nerves.

ATHOMIN is presented both in Tablets and Injections.

For further information, write to:

AEON CHEMICAL INDUSTRIES LTD.,

55, Canning Street,

CALCUTTA-1.

ANNOUNCING

another potent O.R.C.L product

AMINOPLEXIN

Each fluid ounce contains:

Amino Acids	.. 25%	Folic Acid	.. 4 mg.
Vitamin B ₁	.. 8 mg.	Vitamin B ₁₂	.. 10 mcg.
Vitamin B ₂	.. 2 mg.	Vitamin C	.. 50 mg.
Vitamin B ₆	.. 1 mg.	Calcium Glycerophosphate	.. 2 gr.
Niacinamide	.. 25 mg.	Sodium Glycerophosphate	.. 1 gr.
Calcium Pantothenate	.. 1.5 mg.	Potassium Glycerophosphate	.. 1 gr.
Manganese Glycerophosphate		.. 1 gr.	

Indicated in Protein deficiency due to malnutrition and starvation. Peptic ulcers, Cirrhosis of Liver, run-down condition etc., etc.

THE ORIENTAL RESEARCH & CHEMICAL LABORATORY LTD.
"QUMARESH HOUSE" :: SALKIA, HOWRAH.

ALWAYS ONE STEP AHEAD

SACCHARATED IRON OXIDE, now recommended by all Medical Authorities for treatment of Iron deficiency Anemias, has been used in our well-known TONIC-INDON SINCE 1942.

TONIC-INDON

A VITAMIN-IRON-PHOSPHATE TONIC

Improved Formula with Folic Acid

TONIC-INDON is invaluable in all conditions requiring intensive iron medication. With the recommended dosage a large amount of soluble iron can be administered per day without the slightest discomfort.

VITAMINDON-SYRUP

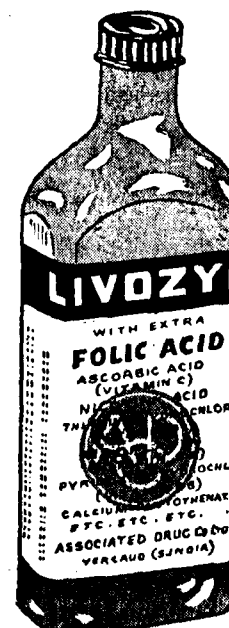
HIGH POTENCY VITAMIN B COMPLEX

Vitamins Syrup is a concentrated preparation of vitamins of B complex in a palatable liquid form pleasantly flavoured and hence easily administered even to infants and children.



Manufactured by

INDO-PHARMA
PHARMACEUTICAL WORKS
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Livozyme

WITH EXTRA

FOLIC ACID

IS A MODIFIED

Non-Ferruginous Form of the Nutritive, Nutrition-Promoting, Non-Alcoholic and Restorative Tonic, LIVOZYME, fortified with Extra Folic Acid, Riboflavin, Calcium Pantothenate Pyridoxine Hydrochloride and Ascorbic Acid (Vitamin C).

Possessing enhanced Haemopoietic action in Nutritional Macrocytic Anemias and an enhanced repairing and tonic effect on the Neuro-Muscular Mechanism of the Gastro-Intestinal Tract in Sprue Syndrome.

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

ACID BUTTERMILK DIET

OF UNVARYING COMPOSITION



The difficulty of preparing acid buttermilk is overcome by "Eledon". This dried product of unvarying composition has made it possible to prescribe a buttermilk diet whenever its use is indicated.

Under medical supervision "Eledon" will form a normal food for infants for several months in succession (its calorific value is the same as that of whole milk, while its content of milk fat is slightly less than half that of whole milk).

It is specially suitable for children who do not thrive on the breast, or when normal milk is badly tolerated, whilst it is ideal for premature infants as a substitute for, or an addition to, mother's milk.

It is invaluable for skin disorders and pylorospasm in infants, for acute gastritis, liver disorders and constipation in older children and adults, and for diarrhoea and dysentery patients of all ages.

Eledon

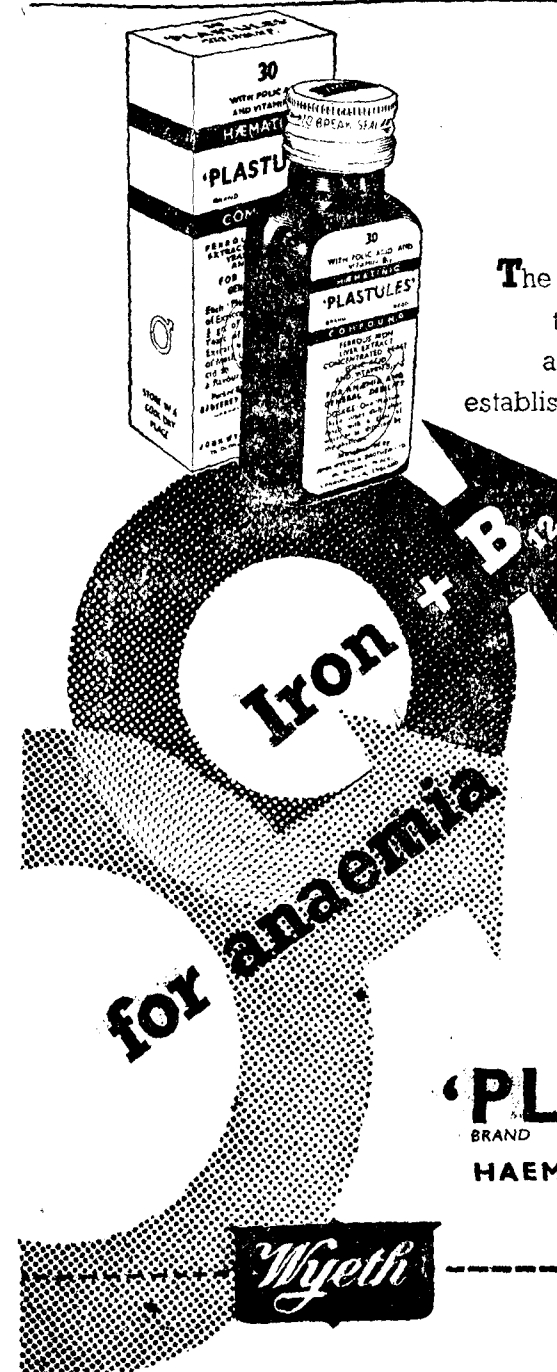
NESTLÉ'S
PRODUCT

Please write for literature to:

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G.E-2



The efficacy of 'Plastules' in the treatment of iron-deficiency anaemias has now been well established. 'Plastules' Liver and 'Plastules' Folic Acid ensure maximum haemopoiesis in cases of delayed response. Now that vitamin B₁₂ is also being used extensively for anaemias a fourth variety of 'Plastules'—'PLASTULES' with VITAMIN B₁₂—has been added to the well-known Wyeth range of haematinic preparations.

'PLASTULES'
BRAND REGD.
HAEMATINIC COMPOUND

Wyeth

JOHN WYETH & BROTHER LIMITED, LONDON

Distributors: **GEOFFREY MANNERS & CO., LTD.**
Bombay • Calcutta • Madras • Delhi

A NEW HIGH-POTENCY
HEMATINIC, FOR MICROCYTIC AND
MACROCYTIC ANAEMIAS

High
Potency

REDICYTE

HEMATINIC CAPSULES

ADVANTAGES OF REDICYTE

REDICYTE provides all the known elements essential for treatment of hypochromic microcytic anaemias and the macrocytic and megaloblastic anaemias. REDICYTE facilitates the simultaneous correction of deficiencies of more than one of the essential nutrient factors. REDICYTE is particularly valuable when diagnosis of the specific type of anaemia is difficult or in doubt. REDICYTE is furnished in easy-to-take capsule form for oral administration. Additional advantages of REDICYTE can be seen by an examination of its component factors.

Each REDICYTE capsu contains:

THIAMINE HYDROCHLORIDE (vitamin B ₁)	2 mg.
RIBOFLAVIN (vitamin B ₂)	2 mg.
PYRIDOXINE hydrochloride (vitamin B ₆)	1 mg.
Vitamin B ₁₂ crystalline	10 mcg.
Folic Acid	1 mg.
Ascorbic Acid (vitamin C)	50 mg.
Ferrous sulfate U.S.P.	0.3 Gm. (5 Gr.)
Liver fraction 2 N.F.	75 mg.
Powdered stomach (not U.S.P.)	75 mg.

Vitamin B₁₂
Folic Acid
Powdered Stomach
Liver
Iron
Vitamin C
Vitamin B complex.



IN BOTTLES OF 36 CAPSULES

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& DOHME**

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Polyvalent preparation of
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Each dragee contains

Lipase	.. 0.056 gm.
Amylase	.. 0.065 gm.
Protease	.. 0.075 gm.
Cellulase	.. 0.070 gm.
Pepsine	.. 0.080 gm.

Packings: Bottle of 30 dragees.

Dr. A. WANDER S. A., BERNE-SWITZERLAND.

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

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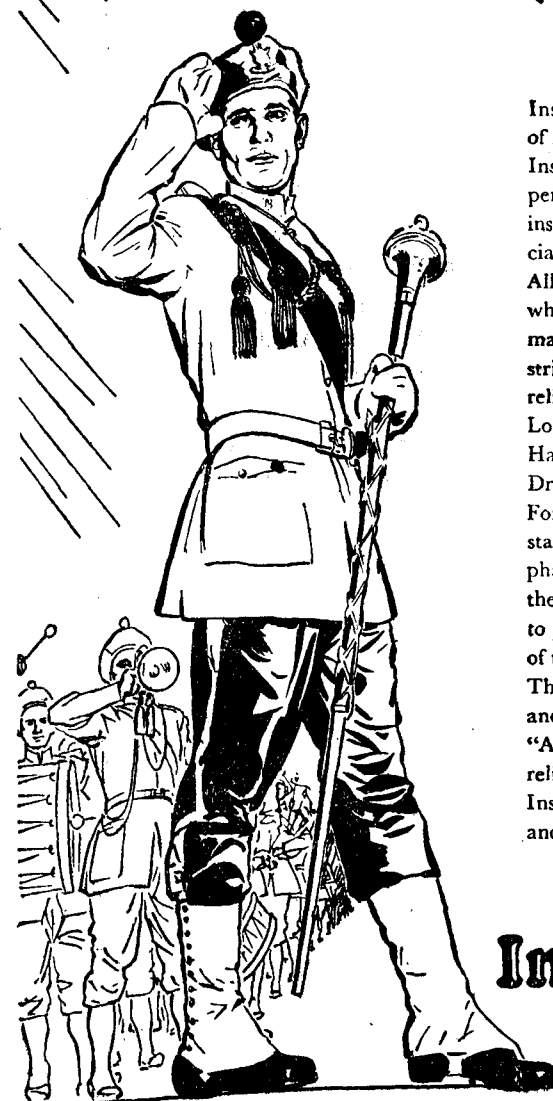
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Company for the Import and Export of Chemical
Products and Raw Materials

PANSKA 9, PRAHA II, CZECHOSLOVAKIA



**ALWAYS IN
THE LEAD...**



Insulin A.B. was the first Insulin of British manufacture and now Insulin A.B. containing 40 units per c.c. is the first injection of insulin to be processed commercially in India.

All batches of Insulin A.B., whether of British or of Indian manufacture, must pass the same stringent tests for potency, reliability, and stability in the London laboratories of Allen & Hanburys Ltd. and The British Drug Houses Ltd.

For 30 years the joint scientific staff of these two leading pharmaceutical houses have pooled their knowledge and experience to produce insulin products of the highest quality.

Throughout the world doctors and diabetics now recognise "A.B." as the hall-mark of reliability.

Insulin A.B. ensures economical and trouble-free treatment.

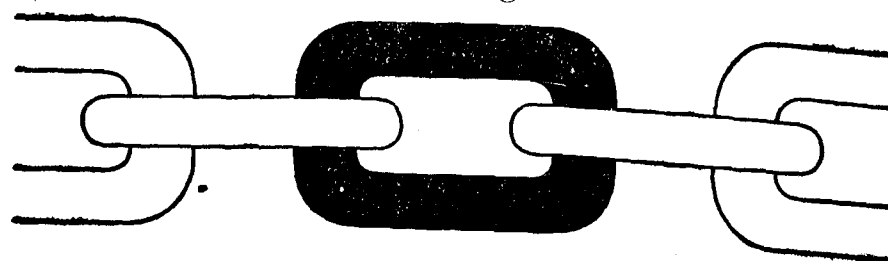
Insulin A.B.

Joint Licensees and manufacturers: —

ALLEN & HANBURYS LTD. (Incorporated in England) THE BRITISH DRUG HOUSES (India) LTD.

AHX-1

Linked Together



Vitamin B₁₂ potentiated by folic acid

'ANAFOLIN'

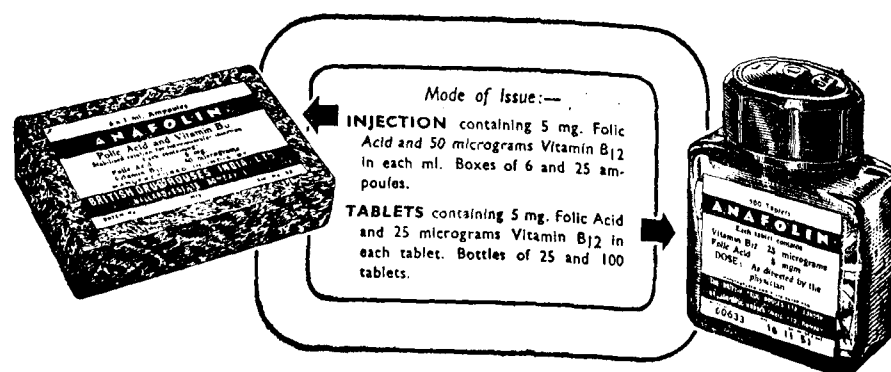
for the treatment of Megaloblastic Anaemia and Sprue

Where the marrow is megaloblastic, both folic acid and Vitamin B₁₂ are necessary to re-establish normal erythropoiesis.

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Furthermore, ANAFOLIN is the ideal tonic in malnutrition and convalescence, improving the absorption of glucose, fat and fat-soluble vitamins, and promoting a better utilization of dietary protein.

ANAFOLIN presents the essential factors folic acid and Vitamin B₁₂ in balanced proportions for parenteral and oral administration.



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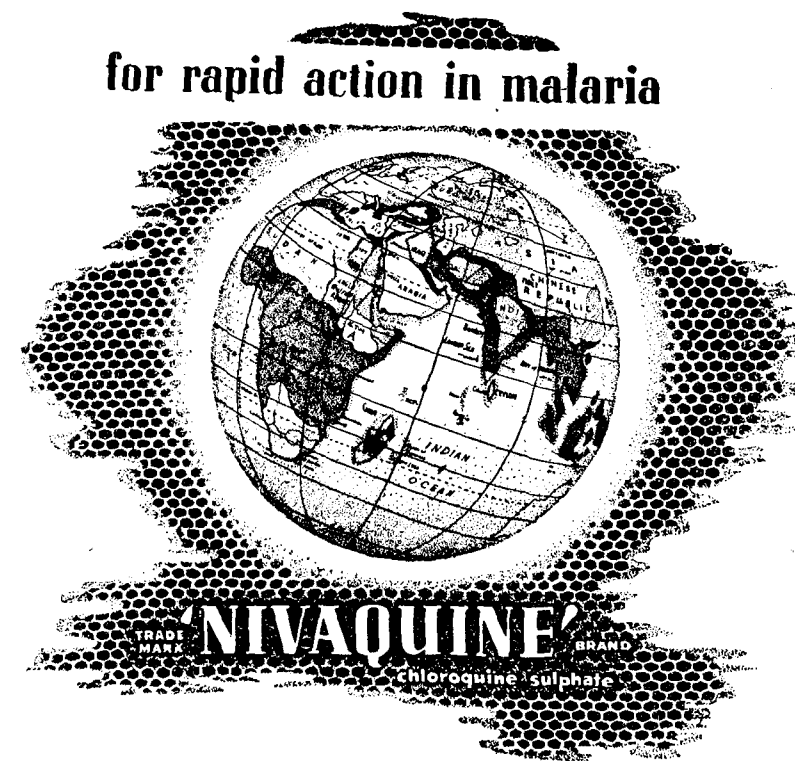
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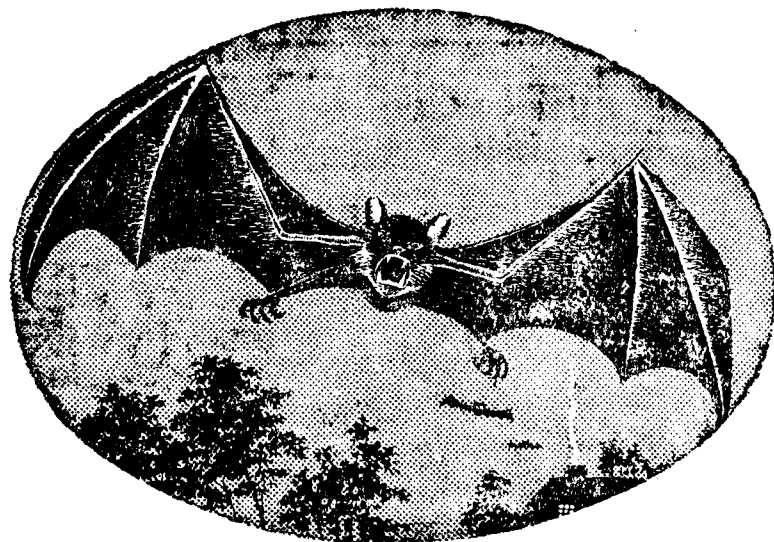


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Annual Subscription: Rs. 7-8-0. Foreign—Rs. 10—Post Paid.

Vol. 50

OCTOBER, 1953

No. 10

Original Articles

ACUTE INTERSTITIAL FIBROSIS OF THE LUNGS*

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ACUTE diffuse interstitial fibrosis of the lungs is a distinct pathological entity, clinically characterised by sudden onset of cough, hæmoptysis, dyspnoea, cyanosis and fever. It is of obscure ætiology. Hammon and Rich in 1944, reported for the first time the clinical history and necropsy findings of 4 cases. A year later Eder and his associates reported the fifth case, which they observed, was rare. In 1952 Callahan added one more to the list of 11 reported cases, based on a review of the clinical, roentgenological and necropsy findings. Miliary, nodular or mottled infiltrations involving the lungs revealed by roentgenological shadows, in cases of sudden febrile respiratory or cardiac distress may suggest the morbid state during life. In all the reported cases, except one, the diagnosis was made by a repeated study of the microscopic sections of the autopsy material.

Death from cardiac failure or emphysema has occurred in an illness of a few weeks, although the period of survival varied from a month to 3½ years. It is not possible to say with certainty the recovery rate of these cases, for an accurate diagnosis of acute interstitial fibrosis of the lungs is made only from a necropsy study.

* Specially contributed to THE ANTISEPTIC

Hammon and Rich suggested inflammatory and chemical irritants as well as sensitivity to various agents, as the possible causes of this morbid process in the lungs. Histologically, the picture is similar to influenzal pneumonia with a characteristic hyaline membrane in many cases. Allen and Spitz observed interstitial pneumonitis in scrub typhus and other rickettsial diseases.

Interstitial fibrosis of the lungs is the fundamental histological change reported by all. The progressive nature of the disease is supported by the different stages of development of fibrotic reaction found in various parts of the lungs.

Material:—In 187 necropsies conducted in the department of Forensic Medicine of the Andhra Medical College, Vishakhapatnam, on deaths resulting from violent and natural causes, 14 were attributable to morbid changes in the lungs, as detailed below:

Tuber- culosis	Lobar pneumonia	Broncho- pneumonia	Acute interstitial fibrosis	Abscess	Total.
6	4	2	1	1	14

CASE REPORT:—An unidentified male, aged about 35, died at 9-30 p.m. at the casualty department of King George's Hospital, Vishakhapatnam on 31-12-50.

Chief necropsy findings inclusive of histology.—*P. M. No. 101:*—A well-built individual; no marks of violence seen; not icteric. Minor degree of oedema of the legs observed.

Lungs:—The right lung was adherent to the parietes by dense adhesions. It was voluminous and weighed 1260 g. The cut-surface of the lung presented typical red granite appearance in the upper two lobes. These lobes were firm, and pieces taken from them sank in water. Histological study of multiple sections of these two lobes revealed a polymorphic picture. Ballooning of groups of alveoli and intra-alveolar hæmorrhages were conspicuous (Fig. 1). No heart-failure cells were seen. A large number of the alveoli were plugged with fibrin-like material, which appeared to traverse the adjacent alveoli, through the interalveolar pores of Cohn (Fig. 2). This fibrin material in some of the alveoli had transformed into fibrous tissue. (Fig. 3). The sections were negative for Prussian-blue and methyl-violet reactions. Inter-alveolar spaces could hardly be made out as they were the sites of fibrosis. Peribronchial infiltration with round cells was frequently observed in all sections examined. Necrosis and denudation of bronchial epithelium with or without hyaline-like material occluding the bronchial lumen were seen. (Figs. 4 & 5). Cuff of round cell infiltration around the pulmonary arterioles was uniformly found. Some of the vessels were the sites of subintimal proliferation. Polymorphonuclears were conspicuous by their absence.

Acute Interstitial Fibrosis of the Lungs

D. J. Reddy

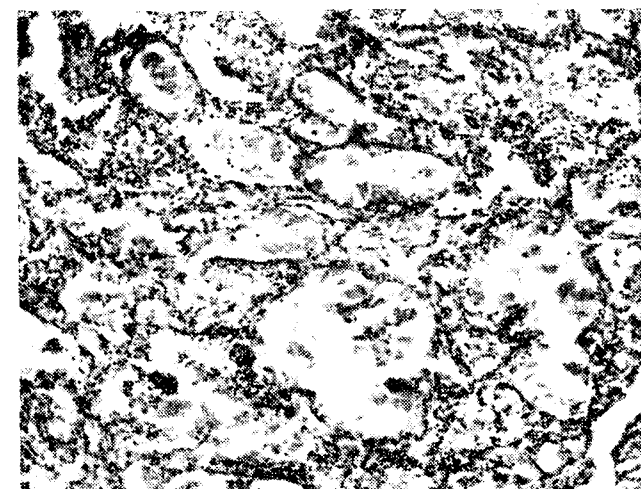


FIG. 1.—Photomicrograph illustrates ballooning of the alveoli and intra-alveolar hæmorrhages. (H & E x 60).

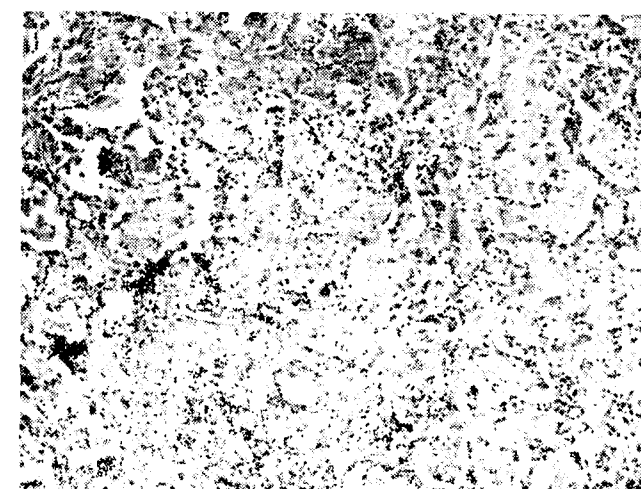


FIG. 2.—Photomicrograph illustrates alveoli filled with fibrin-like material. The fibrin material is seen stretching into adjacent alveoli through interalveolar pores of Cohn (H & E x 60).

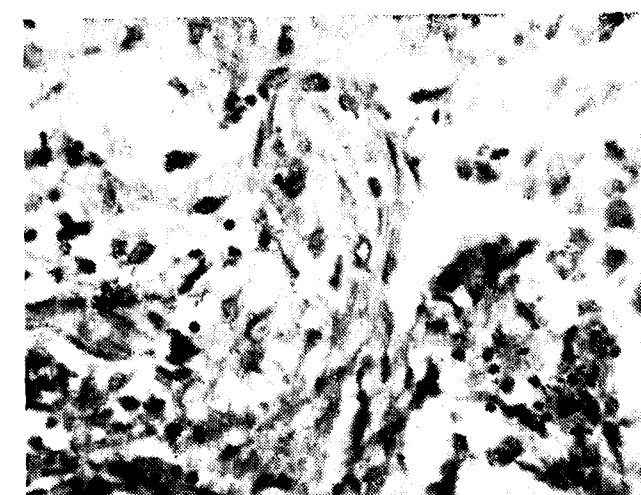


FIG. 3.—Photomicrograph illustrates organisation of the fibrin material within an alveolus. (H & E x 120).

FIG. 4.—Photomicrograph illustrates bronchial lumen filled with hyaline-like material containing denuded fragments of epithelium. Peribronchial infiltration with multiple layers of round cells and interstitial reaction are seen. (H & E x 60).



FIG. 5.—Photomicrograph illustrates necrosis and denudation of the lining epithelium of the bronchiole, peribronchial and interstitial infiltration with round cells and interstitial fibrosis. (H & E x 40).

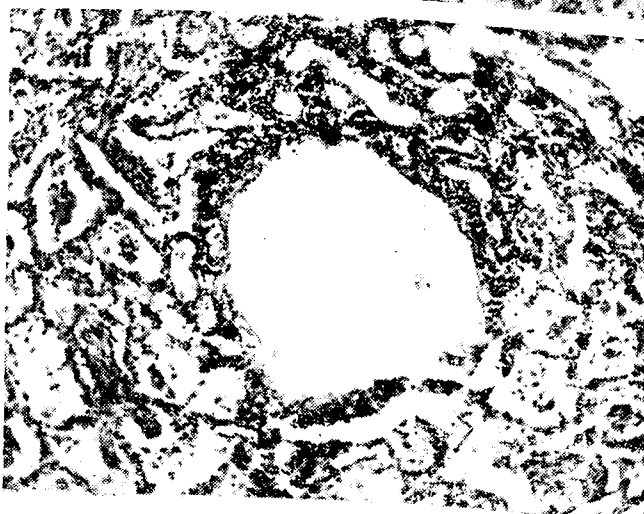


FIG. 6.—Photomicrograph shows perivascular cuff of round cells.



The right lower lobe of the lung was crepitant and microscopic study revealed a mild degree of congestion. The left lung weighed 600 g. and was less crepitant than normal. Histological study of the sections revealed a mild degree of oedema of the lung.

The heart weighed 350 g. The right half of the heart appeared to be dilated. There was no organic valvular or myocardial lesion. The liver was greatly enlarged and weighed 2320 g. Marked dilatation and acute congestion of the sinusoids were found in the sections histologically examined. The spleen and kidneys presented evidence of acute congestion.

Cause of death:—"Acute cardiac-failure complicating acute interstitial fibrosis of the lungs".

Discussion.—The gross morbid appearance of the right upper two lobes of the lungs at the time of the necropsy was suggestive of lobar pneumonia—stage of red hepatisation. But the histological picture detailed above was contrary to expectations. In the absence of clinical history, organic valvular or myocardial disease of the heart and the limitation of the morbid change to the right upper lobes of the lung, were suggestive of acute interstitial fibrosis of the lung, probably of influenzal aetiology.

In 1937, Scadding found at autopsy, a gross picture of lobar pneumonia which on histological study proved to be acute interstitial pneumonia, in a girl aged 16 years who died after a febrile illness of 72 hours, associated with respiratory embarrassment. Plum-coloured areas of pulmonary consolidation, limited to one or more lobes which presented the identical histological picture recorded above, were reported by Andrews *et al* in 1934 and Straub in 1937 in mice infected with the influenza virus.

Summary and conclusions.—1. Autopsy and histological findings in a case of death, the result of acute interstitial fibrosis of the lung are recorded.

2. The close similarity of the gross and histological picture to that observed in mice infected with influenza virus suggests an influenzal causal agent for the morbid changes noted in the lung of the deceased.

3. The dissimilarity of the morbid changes in the lungs in lobar pneumonia and influenzal pneumonia or acute interstitial fibrosis of the lungs is only disclosed by a histological study.

4. Acute interstitial fibrosis of the lungs of obscure aetiology though rare, occasionally offers thought-provoking material for the morbid anatomist.

ACKNOWLEDGEMENT:—I acknowledge with pleasure, the help rendered by the photo artists Mr. Edwin and his son.

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The Relation of Heretofore Unreported Lesions in the Pathogenesis of Herpes Zoster

The first significant observations relating to the nature and pathogenesis of herpes zoster, are credited to Baerensprung (1863) who by post-mortem observations established the association of the segmental cutaneous eruption with a lesion of the segmental root ganglion. This was substantiated by Head and Campbell (1900); Campbell reported the occurrence in 2 cases of a puerperal neuritis also. Others have likewise noted neuritis, though its presence has generally received little attention in the histological descriptions. Kundratitz and subsequent investigators (1925 to 1932) proved by inoculation experiments that the disease was an infectious one, and that the cutaneous lesions were of viral aetiology. The responsible virus was believed to travel along the peripheral nerve between the dorsal root ganglion and the skin. This was clearly demonstrated by Goodpasture and Teague (*J. Med. Res.*, 44: 139-184) in herpes simplex, which clinically, histologically and experimentally has many features in common with herpes zoster. There has however, not been a general agreement as to the direction of travel of the zoster virus along a peripheral nerve. The portal of entry and the means by which the virus gains access to the dorsal root ganglion and spreads in the body, have been studied carefully by Dr. W. J. Cheatham of the Vanderbilt University School of Medicine, in Tennessee. He presents a case of herpes zoster in a woman aged 50, with varicelliform eruption, in which intranuclear inclusion bodies were demonstrated within the oesophageal mucosa, myenteric plexus of the stomach, dorsal root ganglia and a sympathetic ganglion at the level of the affected dorsal root ganglia. In addition, similar inclusions were seen within cells in lesions of the pancreas, adrenal glands, and one ovary associated with focal necrosis. Such lesions have not been previously described in zoster. Cheatham postulates that the virus entered the body *via* the sympathetic nerves of the oesophagus and migrated by the sympathetic nerves to the dorsal root ganglia, eventually reaching the skin by the centrifugal spread along the peripheral nerves. The disseminated visceral and cutaneous lesions resembled those of varicella.

The virus of both herpes zoster and varicella are probably identical. In varicella, the lesions result from a haematogenous spread in a non-immune individual; in herpes zoster they are tentatively considered to result from neurogenous spread in a person with humoral immunity. The respiratory and gastro-intestinal tracts probably serve as portals of entry in most cases of herpes zoster.—(*Am. Jour. Pathol.*, 29: 3, June 1953).

THE MANAGEMENT OF ACCIDENT CASES IN A FACTORY

L. BARMAN, L.M.S. (Bengal),

Medical Officer, Messrs. C. Oomens & Sons Ltd. and
Messrs. Simplex Concrete Piles (India) Ltd., Calcutta.

MINOR and major accidents are very common occurrences in factories, requiring prompt and efficient attention. Injuries are the commonest among accidents and vary from simple contusions to lacerated and incised wounds.

Contusions are caused by a blow with a blunt instrument or may result from trauma by a heavy load. The skin remains intact while the underlying tissue is affected. If the large vessels get torn, the extravasated blood may collect as a hæmatoma. Such a collection of blood may remain fluid for sometime or get absorbed very slowly. If it is a large one it may need incision. An infected hæmatoma should be treated as an abscess. Contusion if seen early may be treated by rest, application of cold compresses under a pressure bandage. In later stages, absorption may be hastened by gentle movement and massage.

The crushed tissues in a lacerated wound are insensitive to pain owing to the destruction of nerve endings. So, the general constitutional upset *i.e.*, shock, is slight unless there is profuse hæmorrhage.

Incised wounds are usually larger, and should be examined carefully to see if important nerves or tendons in the deeper parts have been cut.

Punctured wounds are caused by the penetration of sharp instruments, and are very often serious (a) as a portion of the instrument may have been broken and got lodged in the depths of the wound; (b) as extensive damage to the deep structures may have been inflicted; (c) as severe bleeding may occur into the body cavity without any signs of external bleeding; and (d) as infection may occur with pent-up pus in the cavity or in the deeper structures. Small punctured wounds of fingers frequently become infected and give rise to whitlow.

Primary treatment of wounds.—The first step is to sterilise the wound-margins and adjacent skin with soap and water. The wound itself should be irrigated with warm saline, all foreign particles removed, all pockets opened and cleared up. Very often excision of the wound may be urgently required, particularly when the wound involves the muscles which are particularly prone to infection by the anaerobes of gas gangrene; the first step is to remove the traumatised skin margin. If the skin has been undermined or badly crushed a wide excision will be necessary. The

subcutaneous fat should be removed as it is avascular and sloughs rapidly. The devitalised or damaged fascia and muscles should not be spared in resection. The wound may then be closed, if the excision and cleansing have been satisfactory. The skin should be brought into apposition without tension and stitched up. When the skin loss is greater, the open method should be used.

Treatment of open wounds.—When wounds are seen too late for primary excision or when the wounds are extensive or complicated a complete excision is out of the question and they should be left open and allowed to heal by granulation. The local use of sulphanilamide in conjunction of penicillin or other antibiotic will be of great help.

The closed plaster method is now popular and particularly useful in the treatment of wounds in the limbs: (a) it ensures adequate immobilisation; (b) delays toxic absorption by reducing the lymph flow; (c) prevents air-borne secondary infection; (d) the plaster-case helps the healing process by protecting the part from repeated injuries. This method may be used *only* if a thorough excision of the wound has been made and if the blood supply to the limb is not interfered with. Its only drawback is that the discharge or pus welling up from the wound left intact with the skin for a long time may abrade the skin margin and interfere with the epithelial growth. This can be prevented by a slight modification of the original technique i.e., instead of sterile vaseline-gauze, sulphanilamide powder may be applied generously padded with several layers of absorbent gauze.

Sprain is the next common accident and results from a violent stretching or twisting which causes the joint to move beyond its physiological limits or in some other direction for which it is not structurally adapted. The ligaments which suffer violence get torn or stretched and the synovial membrane is damaged. The muscles and tendons are stretched, torn or dislocated and sometimes the superficial portions of bones are also affected at the site of the ligamentous attachments.

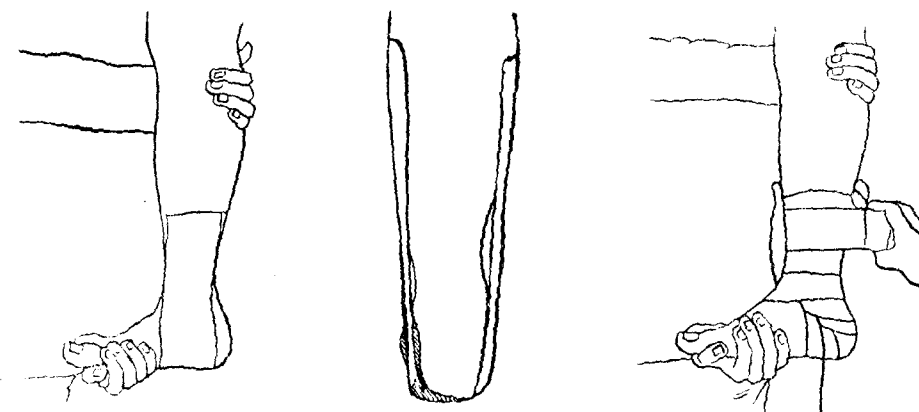
Treatment consists of:—(a) The application of cold to control local oedema and hæmorrhage and (b) rest from undue stretching to the sprained part, in a suitably relaxed position and maintained by straps.

Sprain of the wrist-joint is a very common injury resulting from a twist or the backfiring of a motor crank or a fall on the hand. There is generally considerable swelling and it may simulate Colles fracture, separation of lower radial epiphysis or a dislocation of the wrist. The normal relation of the styloid process and other bony points remains unaltered.

Sprains of the knee-joint are also fairly common accidents. In addition to the tearing or stretching of the ligament, there may be

a considerable amount of effusion into the joint. The condition may be mistaken for an injury to the lower end of the femur or the upper end of the tibia. In treating recent injuries, the patient should be confined to bed with firm pressure applied to the joint. The bandage should be removed once a day to allow massage and gentle passive movement, with hot and cold douches. In chronic cases, good results are obtained by rest and Scott's dressing.

Sprains of the ankle joint result from a sudden wrench or unbalanced movement of the legs during loading or unloading of heavy articles in the factory. Of the three bands of the lateral ligaments, the anterior and middle bands are usually affected. Application of cold compress and firm elastoplast strapping should be applied to prevent further oedema. The strapping should be applied so as to permit the affected ligaments to remain relaxed. A wedge-shaped rubber pad plugged on the outer side of the heel would help good relaxation. The patient should be ambulant throughout. *Vide* the sketch on the page illustrating the elastoplast strapping. In the case of sprains of the small joints of the foot commonly met with among athletes, strapping helps the stretching due to unnatural movements. Active movement should be permitted, as too much of rest would result in a persistent painful condition in the course of healing.



Elasto-plast strapping.

Among industrial accidents those affecting the hands and eyes are very serious requiring careful and intelligent handling. A slight mechanical imperfection may cause serious disability—even the loss of one's livelihood. Only the superficial wounds in the hand, may be treated in the out-patient department.

In serious injury, if the conservative method is to be adopted a thorough excision of the wound would be necessary; the wound surfaces and pockets are then dusted with sulphanilamide powder. The later steps in treatment will depend on the nature and type of the wounds.

A simple incised wound in the hand :—In the absence of tendon-injury, the incised wound of the fingers may be sutured. The divided nerves should be sutured if ends are recognised and the sheaths are apposed by one or two silk threads.

Lacerated wounds :—Wounds are generally caused by getting crushed by machinery. The damage may be so extensive that an immediate amputation may be necessary and so hospitalisation of the patient is urgently required. In lacerated wounds of the hands or fingers every attempt should be made to conserve the finger and to this end efficient sterilisation of the wound is essential. The primary suture of divided tendons should *never* be attempted. The skin is loosely closed if it is possible to do so without tension; otherwise it must be left open. A sterile vaseline gauze dressing should be applied.

For the treatment of cut-tendons the patient should be sent to a hospital where adequate surgical facilities can be had. The eminent surgeon Rear-Admiral Cecil P. G. Wakeley, F.R.C.S., says "If an extensor tendon is severed, a simple yet practical method is to suture the cut ends of the tendons by stainless steel wire, the same suture being made to unite the skin as well. Adequate splinting will prevent the tendon-ends from pulling apart. Catgut is an unsatisfactory suture material for tendons as it causes much tissue-reaction and infection is more likely to occur. Silk although better than cat-gut, causes considerable fibrosis around the suture line and so hampers movement. It is generally agreed that poorest results in tendon repair are obtained in flexor tendons in their firm narrow sheath. In such cases Bove's method or a modification of it gives good results and should be widely used *especially in industrial accidents*. The severed ends of tendons are found and approximated and the tendons are transfixed with stainless steel pins well away from the injury. The actual wound is closed completely. The ends of the tendons are kept in accurate apposition for three weeks when the transfixed pins are removed. Union is sound and functional anatomical results are excellent."

Treatment of infections of the hands and fingers.—A small prick or punctured wound of the finger frequently gets infected and gives rise to whitlow. A subcuticular blister at the site of the prick requires a small incision only. Should however, the cellular tissue of the pulp of the finger become infected and the distal end of the finger become hard and brawny, an early incision should be made on one or both sides of the palmar aspect of the terminal phalanx but *never in the middle line*. The incisions should not be joined with the transverse one, as this tends to produce a tender scar on the pulp of the finger. In the distal part of the pulp, a series of fibrous septa pass the skin to the periosteum. This space is converted into a number of loculi. A rapid rise of tension in the confined compact space commonly tends to cause the occlusion of blood vessels and

The Management of Accident Cases in a Factory
L. Barman



Left index finger—in flexed condition due to contusion and hæmatoma at forearm.



A splint (with hinges at wrist joint) was applied. A spring-adjuster is attached for flexion and extension (accordingly).

necrosis of the soft bone tissue results. Infection about the nail is very common and it may often be due to trauma or contusion or injury. When there is pus in the nail-fold, an incision is made from a point immediately distal to the junction of the nail-fold and the lateral sulcus on each side. The flap is reflected upwards and the vaseline gauze is insinuated from side to side. After 48 hours, a plastic case should be applied and left for a week. If the collection of pus be under the nail, the base of the nail is removed by means of fine-pointed scissors, after the flap is reflected. If the infection has spread, the flexor sheath of tendons is likely to slough, causing adhesions which may render the finger useless.

After-treatment:—When healing has taken place rehabilitation exercises should be instituted, to prevent stiffness in the finger. This rehabilitation aspect is generally neglected by many, but it is of vital importance.

CASE REPORT:—The photograph given here (*vide picture*) is that of a workman whose forearm (on its lower third of the anterior aspect) met with a serious contusion, resulting in a hæmatoma, that prevented him from extending his index finger. He was treated with infra-red therapy and injections for the hæmatoma, which got absorbed but left a little thickening of the tendon sheath. Being stiff, the finger had to be kept in a flexed position. At last a splint was applied and also remedial exercises. The splint shown in the photograph was made locally by the foreman Mr. Anania, under my direction. The patient resumed his normal duties within a fortnight.

Burns.—Also occur among factory workers and treatment is aimed at controlling the shock and the sepsis that may ensue.

Morphia is usually given. The patient is placed comfortably warm in sterile sheets and blankets. Fluid drinks are given unless there is vomiting. Plasma transfusion is very essential and from the beginning penicillin should be injected. Coramine and Percorten injections should be given in time. A.T. serum (3000) units should be given and repeated after 5 days.

LOCAL TREATMENT:—When the patient has become quiet, the burnt surface is covered over with gauze soaked in Cetavlon solution 1%; this soapy solution is detergent and at the same time antiseptic. The surface is then dried with gauze and covered with penicillin tulle and dry gauze padded with cotton; a tight bandage is then applied. The dressing is opened on the 3rd or 4th day, and the next dressing is done another 5 days later.

Burns of hands, fingers and eyes require special attention:—The fingers are kept separated and in a semi-flexed position. When healing begins, movements of fingers should be started. For the eyes—sterile liquid paraffins are good. Mercurochrome 1% drops may be instilled and penicillin eye-ointment also applied.

Chemical burns and lime burns:—The affected area is doused with ammonium chloride solution (5%) for 10 to 15 minutes, then with plain water for an hour continuously; it is then treated as for any ordinary burn.

Phosphoric acid burn:—The burnt area is painted with 1% copper sulphate so as to form a coating over the phosphorus, then the area is irrigated with normal saline.

Electric burns:—May occur in those engaged in industrial undertakings using high-power electric energy. Superficial ulcers being almost painless are slow in healing. The more severe forms are attended with a great deal of shock. There is comparatively little pain for the first 36 to 48 hours, at the end of which the part becomes extremely painful. A slow form of moist-gangrene sets in and the sloughs are extremely slow to separate. The treatment is on the same lines as for ordinary burns; dry dressing is however, to be preferred in order to avoid the onset of moist-gangrene.

Recently I treated a patient whose body was accidentally exposed to ammonia gas under pressure. As a result the exposed parts of the skin became reddened with large blisters. This was not really a burn case. The gas being cool blanches the skin and excoriates it by mere irritation. This case was treated with triple dye application which relieved the pain and arrested the oozing of fluid.

Klasson (N. Y. State J. M., 54: Oct. 1952), reported his experience with ascorbic acid in the treatment of burns. Ascorbic acid maintains vascular tone and counteracts toxic reactions. The sudden destruction of tissue by burns, decomposes the protein of the muscle into alpha-amino acids, then proceeds to form a corresponding alkylamine. Klasson experimented on sixty cases of mild to severe burns with ascorbic acid. The burned area was painted with 1% solution of ascorbic acid in normal saline. This may safely be applied to any part of the body, even to the eyes. The original dressing is not changed but kept moist. The treatment is continued for 48 to 72 hours. In addition to local treatment 300 to 200 mg. of Vitamin C is given daily parenterally or orally. In cases of severe sloughing, a solution of penicillin (1000 per c.c.) is used with ascorbic acid ointment.

Foreign bodies in the eyes:—We frequently have to deal with particles of iron, cinders or other foreign substances which get imbedded in the mucous membrane of the eyes. When the particle gets lodged in the cornea great care is necessary in removing it without driving it further deep into the tissues.

The patient should be made to keep still while the operator passes a spud back and forth over the cornea and over the foreign body, until it is finally removed. The eye is irrigated with normal

sterile saline. Sterile liquid paraffin or mercurochrome drops may be instilled into the eye and bandaged properly. If ulceration is apprehended, atropine ointment should be used. If the particles are imbedded in the eye so deeply that it cannot be removed by the above method it should be handled by a competent ophthalmic surgeon.

The routine use of A.T. serum in industrial wounds.—Anti-tetanus serum is usually given in accident cases but it is not always practicable to give A.T. serum to every case, though even a minor injury, if not prophylactically treated with serum, may get infected with tetanus. Then again there is the question of the same man getting injured 3 or 4 times or more in a year; should A.T. serum be injected every time in such cases? Is it safe to inject it every time? A.T. serum may cause serum sickness and a severe hypersensitivity reaction. During the late war, British troops were immunized with doses of tetanus toxoid; when wounded they received A.T. serum soon after injury. American wounded soldiers received a boosting dose of toxoid in place of antitoxin. There were therefore, only a few cases of tetanus in either army. In this factory, I usually inject A.T. serum to lacerated, incised and punctured wounds and particularly to foot injuries. For minor injuries and for those who had been injected previously with A.T. serum, and in the case of fresh wounds, I usually inject tetanus toxoid (A.P.T.) 2 c.c. intramuscularly.

The necessity for mobile medical units in factories:—Sometimes heavy casualties occur amongst factory workers. In such cases immediate hospitalisation is urgently required. In the emergency ward of some hospitals a single medical officer has to attend to every emergency case—poisoning, drowning, stabbing as also serious medical cases and is unable to attend to all of them promptly and well.

The emergency wards in hospitals should be well maintained with necessary equipments for X-ray, blood transfusion and laboratory tests. An experienced surgeon with nursing and other staff should be always available.

A mobile medical unit with a recuperation hospital and a staff of trained rehabilitation experts is an urgent necessity in India which is rapidly getting industrialised. The prevention of accidents and the question of health-security and accident insurance are important subjects in the field of industrial hygiene and these are receiving the attention of the Central and State governments.

I acknowledge with grateful thanks the great help and cooperation from Mr. T. I. Lake, the Managing Director of Messrs. C. Comens & Sons Ltd. and Messrs. Simplex Concrete Piles Ltd., Calcutta, in attending to the welfare of the labourers and in treating accident

cases. My thanks are also due to Dr. B. N. Lahiri, the Superintendent of Bagla M. Hospital, Calcutta, and Dr. S. K. Sen, the visiting surgeon of Sir Nil Ratan Sarkar's Hospital for valuable suggestions received by me.

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Sealed Drainage of Wounds

Chemotherapy has reduced the need for drainage of wounds, and modern surgical practice dictates the closure of wounds whenever possible. On the other hand, certain wounds must be drained. The reasons for the present aversion to drainage are: (1) the wound requires frequent attention with repeated exposure to secondary infection; (2) healing is delayed, scars are weakened, adhesions are more common and firmer; and (3) the use of bulky dressings, which are confining as well as expensive, is necessary.

Three types of rubber drains, fashioned from ordinary latex tubing, are in use. Lesions can be kept safe and clean without any of the foregoing objections. The drain is inserted into the wound and the skin edge is sealed about the exit. The tube is carefully placed and proved to be working before the wound is firmly closed beyond the most distal collecting hole. The collecting end of the drain is perforated at regular intervals and the distal portion is placed in a glass jar suspended from the bed. The tubing is milked two or three times a day, by squeezing, to free it from clots and fibrin.

This type of drainage has been used by Sheppard after radical mastectomy, cholecystectomy, and after operative procedures on the kidney, as well as after abdominal perineal resection. In large wounds, 10 ounces or more of drainage fluid may be collected daily. The procedure has been used for the past 2 years and at no time has the system had to be abandoned because of pocketing or blocking of the special tubes. Dusting potentially infected wounds with penicillin and sulphadimidine powder encourages the formation of much watery fluid which facilitates the initial flow into the collecting tube and appears to prevent clotting and obstruction. The comfort of the patient, the cleanliness of the dressings and bedclothes, and the healthy appearance of the wound have been convincing evidence that efficient drainage can be safely secured by this closed method of drainage with specially designed tubes. —(*Intern. Abst. Surg.*, Feb. 1953 from *Lancet*, 262: 52).

INJURIES OF THE KNEE*

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FRACTURES or bony injuries are not included in this article but other important injuries, which are sometimes missed are dealt with.

After trauma the knee-joint, swells and most of the cases are diagnosed as traumatic synovitis and treated accordingly; but every case should be properly examined to find out which structure of the knee-joint is injured and proper treatment should be given suitable to the structure traumatised. In all these injuries the important part of the treatment consists in (quadriceps-drill) the regular exercise of the quadriceps muscles. The following five types of injuries should be recognized:—

(1) Traumatic synovitis. (2) Traumatic hæmarthrosis. (3) Injuries to the lateral ligaments. (4) Injuries to the cruciate ligaments. (5) Injuries to the semilunar cartilages.

I. Traumatic synovitis.—This type of injury is usually a strain or a twist and clinically we find the swelling of the joint with synovial effusion with patellar tap. Immobilisation by a tight bandage is the treatment. Quadriceps-drill is begun at once. Within about two weeks the recovery is complete. In a few cases local heat in the form of infra-red rays or short wave diathermy is advisable in the later stages to hasten the absorption of effusion.

II. Traumatic hæmarthrosis.—In this case the injury is more severe than in No. 1. It causes the rupture of the synovial blood vessels causing hæmarthrosis. The clinical difference between synovitis and hæmarthrosis is that, in hæmarthrosis the joint becomes very rapidly swollen i.e. within an hour; it is hot, firm, and is very painful. There is also a febrile reaction. In simple synovitis the swelling reaches its maximum in from 6 to 8 hours. The treatment of traumatic hæmarthrosis is by aspiration, tight bandage, and immobilisation. This is one of the few conditions in which quadriceps-drill is to be prohibited from the time of injury. Because of the danger of recurrent hæmorrhage in this condition quadriceps-drill is started only after about 10 days.

III. Injuries to the lateral ligaments.—During the flexion of the knee-joint these ligaments are always loose and so never get ruptured. But during extension they are tight. So if abduction or adduction occurs now, one or the other ligament must rupture, otherwise abduction or adduction is impossible.

1. Injury to the internal lateral ligament:—This is more common than injury to the external lateral ligament. It gets

* Specially contributed to THE ANTISEPTIC.

ruptured by abduction of the extended knee. There is swelling and local tenderness. The important sign is pain on abduction of the leg when the ligament gets stretched. In severe injuries there may be lateral mobility of 20° to 30° of abduction.

TREATMENT:—(a) *Slight injury*:—Rest in splint in 10° flexion for 10 days with a tight bandage on. After 10 days the patient is allowed to get up with crooked and elongated heel (raising the inner border of the heel and sole by $\frac{1}{2}$ "). By this, the patient walks on inverted foot and so no strain on the ligament is felt. Shoe is to be retained so long as there is tenderness and until the muscle power becomes normal. Quadriceps-drill, an immediate active non-weight-bearing muscle exercise, is most important.

(b) *Severe injury*:—Rest in splint in 10° flexion is to be continued for 2 to 4 weeks or longer with a tight bandage on. Crooked and elongated heel for a very long time. Quadriceps-drill must be done. Outside supports are not of any use and may even be detrimental. The best support that can be gained is by active non-weight bearing quadriceps-drill.

(c) *Late case*:—Improperly or non-treated cases in which the ligaments have become lax may come for proper treatment. The knee will be unstable and weak on the medial side. Here also the treatment is quadriceps-drill; and most cases will get a stable joint only by this. In rare cases operation is indicated, in which the tendon of the semitendinosus muscle is sutured in place of the medial ligament in order to give strength. This is done after giving a fair trial to quadriceps-drill for some length of time.

2. *Injury to the external lateral ligament*:—This injury is rare, because varus strain which tears this ligament is less frequent than valgus-strain which injures the internal ligament. It is diagnosed by local tenderness and an abnormal adduction. The treatment is on the same lines as above. Even if laxity of ligament remains, it does not matter very much, because the strong ileo-tibial band and biceps femoris replace the action of the ligament.

IV. Injuries to cruciate ligaments.—1. *Anterior cruciate ligaments*:—It prevents the hyperextension of the joint and prevents forward sliding of the tibia on the femur. It is therefore, injured by hyperextension of the joint or a forward sliding of the tibia.

2. *Posterior cruciate ligament*:—It prevents backward sliding of the tibia on the femur. It is therefore, injured by backward sliding which happens usually when the person is travelling in a motor car or train, when the impact of the force comes to the front of the tibia while the knee is in a right-angled flexion. The important point for diagnosis is abnormal antero-posterior mobility depending upon the injury to the particular cruciate ligament.

TREATMENT is the same for injury to either cartilage. Fortunately the tear is usually partial. Keep the limb in 40° flexion for 4 to 6 months. During the period of immobilisation quadriceps-drill should be practised. The results of this conservative treatment are good.

Operation to suture the torn cruciate ligament or to replace it by a portion of fascia lata is not efficacious. In late cases, very rarely, arthrodesis of the knee-joint is required to stabilize the joint and to relieve the pain.

V. Injury to the semilunar cartilage.—This injury is due to rotational strain. During extension of the joint, rotation cannot occur and so injury to semilunar cartilages cannot also occur. Tearing of the cartilages occurs due to weight-bearing rotational strain in a flexed knee. External rotation of the tibia, or if the tibia is fixed, the internal rotation of the femur produces tearing of the internal cartilage. Internal rotation of the tibia produces injury to the lateral cartilage. Injury to the medial cartilage is more common than injury to the lateral cartilage; the ratio being about 5 to 1. This is because of (a) the anatomical arrangement of the inner and outer part of the joint, and (b) the prominence of the medial side of the knee.

1. *Injury to the medial semilunar cartilage*:—Very often a typical history is obtained, which is as follows:—While the knee was flexed, the patient got a trauma by which an external rotation of the leg or an internal rotation of the thigh occurred suddenly; there was acute pain on the inner aspect of the joint with locking of the joint i.e. inability to extend the knee fully. After flexing the joint several times something was felt to slip on the inner side; and the knee could then be straightened. Next day the joint got swollen, tender and remained so for 5 to 6 days. With rest, the swelling disappeared. On subsequent occasions a similar rotation of the joint was followed by a similar disability and a similar swelling which were less severe than on the first occasion. So the features of the case are (a) typical rotational strain on flexed knee; (b) typical pain and tenderness on the inner side of the joint; (c) history of sudden locking; (d) history of equally sudden unlocking; (e) synovitis which became less on subsequent injuries and (f) a normal X-ray appearance of the knee. Diagnosis is facilitated by a test, as follows:—

The knee is fully flexed so that the heel is touching the buttock. The leg is externally rotated and abducted at the knee. This would mean that the inner side of the joint is opened and then slowly closed while the joint is being extended. An easily palpable and often audible click is produced as the pedunculated fragment slips between the femoral condyle and tibial tuberosity.

Treatment of the first injury is conservative, and works if there is a small peripheral tear. If the tear is more central, conservative treatment will not avail. So, when there is a recurrence of the attack,

only operative treatment will avail. Conservative treatment is manipulation under anaesthesia. First open the joint by flexion, abduction and external rotation. Then close by extension, adduction and internal rotation. After this the joint is immobilised by plaster. Quadriceps-drill is most important. For recurrent attacks the only treatment is a complete removal of the medial semilunar cartilage, the result of which is excellent.

2. *Injury to the lateral semilunar cartilage*:—It is due to an adduction, internal rotational strain of the tibia on the femur in flexed knee. There is pain and tenderness on the outer side of the knee. The cartilage click is elicited when the fully flexed leg is adducted, internally rotated, and gradually extended. This click is felt and often heard. The treatment of the first attack is conservative and of recurrent attacks is operative, as in injuries to the medial semilunar cartilage.

Total Patellectomy in the Treatment of Arthrosis of the Knee

Debeyre and Levernieux stress total patellectomy as a treatment in early arthrosis of the knee. The best results are obtained if the arthrosis is limited to the patella and the anterior surface of the femoral trochlea. An essential point is that, after patellectomy, complete extension of the knee is again possible. In this way, the normal axis of the leg is re-established and a main factor for progressive, tibiofemoral arthrosis is eliminated.

In 4 out of 6 cases, the authors obtained good results, as judged from a follow-up of patients, seven to thirteen months after the operation.—(*Intern. Abst. Surg.*, p. 180, Feb. 1953).

Osteoma of the Patella and Rupture of the Patellary Ligament in the Child

Fevre and Duparc report the case of a post-traumatic osteoma of the distal tip of the patella in a boy, 12 years of age. Five months after the injury, he was unable to extend the leg actively although passive movements of flexion and extension were possible to the full extent. He walked with a limp and showed marked atrophy of the thigh.

The operation revealed a mass of osseous tissue at the distal end of the patella. The patellary ligament was reduced to a thin fibrous band. The exostosis was removed, and the ligament repaired by transplantation of a portion of the quadriceps tendon.

In discussing the pathogenesis of the osteoma, the authors leave the question open, as to whether the original lesion was a rupture of the patellary ligament or a fracture of the apex of the patella.—(*Intern. Abst. Surg.*, p. 176, Feb. 1953).

SOME PHYSIOLOGICALLY ACTIVE NATURAL ORGANIC PIGMENTS*

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PART II

Quinonoid Compounds *vis-a-vis* Their Chemistry and Characterisation

Introduction.—In the August 1953 issue of the *ANTISEPTIC* (pp. 590-593) was given a resume of the more important flavonoid pigments with special reference to their vitamin-like properties. Some of the quinonoid compounds also have been found to possess similar appreciable vitamin efficacy and are described in this article, with particular relation to their chemistry and characterisation.

Quinonoid pigments *vis-a-vis* their vitaminoid and related physiological properties.—Besides some naphthoquinone pigments well known for their vitamin K activity (see below), other types of quinones present in nature also find medicinal use. The following are such compounds described in the sequential order of their chemical structure.

I. *Benzoquinone derivatives*:—Among the number of pigments of this group reported for their biological activity, embelin (*Pharm. J.*, 1887-1888, 18; 601; 1888-1889, 19; 305; Heffter, Feurste, *Arch. Pharm.*, 1900; 238, 15) should be specially mentioned for its anthelmintic properties. Embelin is a golden yellow pigment isolated from the fruits of *Embelia ribes*. Its constitution as 3:6-dihydroxy-2-lauryl-benzoquinone was until recently accepted. But based on its properties and reactions, Asano and Yamaguti (*J. Pharm. Soc., Japan*, 1940, 60: 34) gave the formula 3:6-dihydroxy-2-undecyl benzoquinone and this satisfies the formation of lauric acid on oxidation and α -Ketomyristic acid on boiling with alkali.

II. *Naphthoquinone derivatives*:—While almost all green plant material is rich in vitamin K (K_1), alfalfa is however used as a readily available source of this vitamin. Hempseed as well as certain vegetables have been found by Dam to be a good source. A full account of the physiological activity of 'K' vitamins is contained in an earlier paper by the author (*Ind. Med. Record*, 1951, lxxi, 4: 1).

Vitamin K (K_1):—Elucidation of its chemical structure was mainly due to Dam and co-workers (*Biochem. J.*, 1936, 30: 897; *ibid.*, 1937, 31: 17; *Helv. Chim. Acta.*, 1939, 22: 310) and to Almquist (*J. Biol. Chem.*, 1936, 114: 241; 1937, 117: 517; 1937, 120: 635; *ibid.*, 1938, 125: 681; *J. Am. Chem. Soc.*, 1939, 61: 745). The yellow colour of the vitamin and the formation of a

* Part I of this article appeared in the August '53 issue of the *Antiseptic*.

diacetate on reductive acetylation immediately suggested a quinonoid structure. On catalytic hydrogenation, vitamin K₁ takes up four molecules of hydrogen, three of which are employed in reducing the (naphtho-) quinone ring while the fourth reduces an unsaturated side-chain. The nature of the side-chain and the location of the ethylenic linkage are indicated by ozonolysis, whereby a ketone is obtained which is probably identical with 2:6:10-trimethyl pentadecan-14-one. The postulated naphthoquinone nucleus is supported by drastic degradation with chromic acid when phthalic acid and a second product, 2-methyl-1:4-naphthoquinone-3-acetic acid are obtained. The same nucleus is also suggested for vitamin K₁ as well, and its constitution is given as 2-methyl-3-phytyl-1:4-naphthoquinone. Its synthesis was simultaneously achieved in three laboratories (Almquist and Klose, *J. Am. Chem. Soc.*, 1939, 61: 2557; Binkley *et al.*, *ibid*, 1939, 61: 2558; Fieser, *ibid.*, 1939, 61: 2559).

Vitamin K₂:—This is the anti-hæmorrhagic factor presenting in decaying fish meal (McKee *et al.*, *J. Amer. Chem. Soc.*, 1939, 61: 1295; *J. Biol. Chem.*, 1939, 131: 327). Ozonolysis of dihydro-vitamin K₂ diacetate gave 1:4-diacetoxy-2-methyl naphthalene-3-acetaldehyde, identical with the aldehyde obtained by similar means from vitamin K₁, together with approximately 1 mol. of acetone and 5 mols. of levulaldehyde. On this basis the formula of vitamin K₂ was established.

The other naphthoquinone pigments which show vitamin K property include (1) Celastrol monomethyl ether (Gisvold: *J. Am. Pharm. Soc.*, 1939, 28: 440; 1940, 29: 12), (2) Phthiocol, and (3) Lomatol.

III. Anthraquinone derivatives:—The colouring matters of rhubarb and aloes are of significance in pharmaceutical use (*Tiba*, 1931, 9: 711). The chemistry of these products was discussed in detail in "The Natural Organic Colouring Matters" by Perkin and Everst, and "The Chemistry of Natural Colouring Matters" by Mayer and Cook.

IV. Penanthroquinone derivatives:—Pigments of this group are not many and they are known more for their tinctorial properties rather than for medicinal uses.

(To be continued).

Vitamin K₁ In Coronary Artery Disease

Douglas and Brown found that vitamin K₁ was a reliable and effective antidote capable of restoring excessive hypoprothrombinæmia induced by dicoumarol and heparin to safe levels in a short time after administration.—(*Br. Med. Jour.*, 1952: 1: 412).

DIAMINODIPHENYLSULPHONE IN LEPROSY*

(With special reference to its Method of Use and Depot-formation)

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Introduction.—The therapeutic and toxic effects of DDS in the treatment of leprosy have been studied by several workers, as also its effect on the hæmoglobin, weight and general health of the patient. Some leprologists have laid stress on oral administration and the resulting blood concentration, though the same result has been achieved by the parenteral method. Muir was of the opinion that no great superiority could be claimed for either method as regards blood levels. Roy made a comparative study in 1952 of the two procedures. Further observations made by me are recorded in this paper.

Method of use: (1) *Oral*:—Muir selected 119 lepromatous cases for DDS treatment in April 1949 when tablets of DDS had not been manufactured; so he used DDS in sweetened mucilage acacia orally in doses of 50 to 200 mg. daily, for 6 days in a week; then when tablets became available he used tablets of DDS 50 to 300 mg. daily for 6 days in a week. 98 of the 119 cases continued the treatment for 17.1 months on an average (the longest being 24 and the shortest being 6 months). The results obtained after the expiry of 24 months in all the 98 cases are set out in Table 1 and those after 36 months (29 months on an average) in 83 cases of this group are given in Table 2. Twelve discontinued and 3 died in this group.

Orally Administered DDS

TABLE I (98 cases)

After 24 months' (17.1 months on an average) treatment

Negative	2 or 2.0 per cent
Partly negative	5 or 5.1 "
75% less bacilli	10 or 10.2 "
50 " "	14 or 14.2 "
Sl. improved	43 or 43.8 "
Stationary	14 or 14.2 "
Worse	10 or 10.2 "

TABLE II (83 cases)

After 36 months' (29 months on an average) treatment

2 or 2.4 per cent
9 or 10.8 "
7 or 8.4 "
27 or 32.5 "
30 or 36.6 "
2 or 2.4 "
6 or 7.2 "

(2) *Parenteral*:—Cochrane used a suspension of DDS first intradermally and then subcutaneously. Molesworth following the advice of Cochrane used the suspension subcutaneously. They both used 25% and 20% suspensions respectively and reported good results. Roy reported that 12 months' parenteral (subcutaneous) use of DDS gave good results equal to those from the oral

* From a paper read at the 4th All India Leprosy Workers' Conference at Puri,

use of DDS lasting on an average for 17 months. After 24 months' parenteral use of DDS the following results were recorded :—

TABLE III

Negative	4	Slightly improved	68
Partly negative	4	Stationary	7
75 p.c. less bacilli	10	Worse	5
50 p.c. „	34		

The results of an average 29 months' oral treatment with DDS and those of an average 24 months' parenteral treatment are given below :—

	Oral DDS.		Parenteral DDS.	
	17 months' on an average.	29 months' on an average.	12 months' on an average.	24 months' on an average.
Negative	2 or 2 p.c.	2 or 2.4 p.c.	Nil	Nil
Partly negative	5 or 5.1 „	9 or 10.8 „	12 or 8.5 p.c.	4 or 3.0 p.c.
75% less bacilli	10 or 10.2 „	7 or 8.4 „	27 or 13.3 „	4 or 3.0 „
50% „	14 or 14.2 „	27 or 32.5 „	18 or 12.8 „	10 or 7.5 „
Slightly improved	43 or 48.8 „	30 or 36.6 „	47 or 38.5 „	34 or 25.7 „
Stationary	14 or 14.2 „	2 or 2.4 „	20 or 14.3 „	68 or 57.5 „
Worse	10 or 10.2 „	6 or 7.2 „	16 or 11.4 „	7 or 5.3 „
				5 or 3.7 „

Preparation of suspension.—Cochrane used arachis oil for making the suspension, but Molesworth used neutral deodorised in giving the injections; but the cocoanut oil was certainly much better than the arachis oil, as its viscosity was much less and injecting the suspension was much easier, and cocoanut oil was more easily available there. In Parulia, I used all the three oils—arachis, cocoanut and hydnocarpus oil, in a comparative study. All the suspensions were prepared in the same way and used on three different groups of selected patients. The following are the results observed :—

(1) *Suspension in arachis (groundnut) oil* :—The groundnut oil used was bought locally and was not chemically pure. It was filtered before the suspension was made and then sterilized. It took a longer time to get absorbed, and the injection was the most painful of the three suspensions. It is lighter than hydnocarpus but heavier than the cocoanut oil. It is very cheap and costs 12 annas a lb.

(2) *Suspension in hydnocarpus oil* :—Chemically pure hydnocarpus oil with the lowest acid content was used. The suspension was the heaviest of the three and the injections were very difficult to give; but though it was the heaviest suspension, it did not take longer to get absorbed than the other two. Pain during the injection was less than with the suspension of groundnut oil. The price of the oil is Rs. 2/12/- a pound.

(3) *Suspension in cocoanut oil* :—A chemically pure, neutral, deodorized oil was used for the suspension which was the lightest of the three, easily injectable and least painful. Absorption was

also good and its cost was higher than either of the other two being Rs. 6/12/- a pound.

Depot-formations.—A great deal of difficulty has been encountered because of the formation of depots and at times I had a feeling that this procedure should be stopped. In order to determine the cause of these formations, all possible snags in dosage, technique, preparation of suspensions, impurities in the drug were studied with the following results :—

(1) The suspensor, whichever oil is used, is in no way responsible for the depots. (2) These depended on two other factors viz.:

(a) *Allergy* :—Out of 300 inpatients who received injections on each injection-day, four developed depots after each injection in spite of every possible care e.g. changing the oil for suspension, changing the DDS to different brands of different companies, decreasing the doses and percentage strength of suspensions and massaging well. Neither the oil, nor the brand of DDS or its dosage could be considered the causal agent for the depots.

(b) *Quality of the drug* :—To study the quality of DDS three samples were obtained from three well-known manufacturing firms for study.

Sample No. 1 was of a creamy colour and very clean but the crystals were too big to run through the needle of any gauge. This suspension could not be used long owing to the difficulties of injecting and the pain after it.

Sample No. 2 was a moderately fine powder, white in colour. A 20% suspension of this in cocoanut oil could be injected with moderate ease, though the needle of 22 gauge became blocked at times. Full absorption took a long time and breaking of the depots were often observed. In this series 60.7% of the cases showed delayed absorption and 45% of the cases showed signs of suppuration. The number of depots with this suspension sometimes increased enormously. On examining the samples of DDS, a number of tiny black particles could be easily seen with the magnifying glass, or by stirring the suspension in a mortar with the pestle. Some of these were really hard to break with moderate pressure. The whole stock was replaced by the firm but the later supply of powder was no better and I felt convinced that these black particles in the white powder were responsible for most of the depots. The premier workers who complained of depots after the injections wrongly considered the suspensor to be responsible for the depots. It was the bad quality of the particular batch or brand and not the drug DDS that was responsible for the many depots.

Sample No. 3.—This was an extremely fine powder of cream colour, the suspension looked like an emulsion, and the injection could be given easily; the absorption was rapid and there was no pain. While making the suspension a few tiny black particles were

seen, but were easily crushed. The number of depots formed were negligible and there was no suppuration.

Preparation of the suspension.—The method of preparation of the suspension was the same with all oils and all makes of the DDS. The required quantity of DDS powder was weighed and gradually triturated with the oil in a mortar. The whole quantity of the suspension was then put into a wide-mouthed bottle which was after-wards well secured to prevent the entrance of steam. The bottle was sterilized under 15 lbs. pressure for $\frac{1}{2}$ hour (250°F).

Method of use.—After sterilization, the cork of the bottle was removed and replaced by another sterilized cork with two glass tubes, one straight and long reaching the bottom and the other short and bent. This bottle was often shaken and emptied into a small sterilized glass bowl in small quantities at a time. The injections were given biweekly and subcutaneously in the extensor surfaces of the arms and thighs in rotation.

Concentration and doses.—Different concentrations of the suspension have been used since 1945 when Cochrane first used a 25% suspension. I noted that the absorption of DDS depends much more on its quality. A 20% suspension of finer particles (Sample No. 3) was absorbed much more quickly than that of Sample No. 2 in which the particles were coarser. A 10% suspension of No. 2 was however, absorbed much more easily and in a shorter time than a 20% suspension, the quantity injected being double that of the 20% suspension, the dosage of DDS remaining the same. Depots and pain with the weaker suspension are much less (practically none) than the 20% suspension.

DOSAGE:—200 mg. twice weekly are being injected subcutaneously to all, irrespective of age and sex. It is given in 2 c.c. (20%) 400 mg. dose and is not accompanied by pain or depot formation if the DDS powder is very fine (Sample No. 3). With the coarse powder (Sample No. 2), this concentration is not suitable for painless injection. 10% (100 mg. per c.c.) 2 c.c. of this DDS (Sample No. 2) was found to be much better, not so painful and showed less depot formation. A shorter time for absorption has also been noted.

Discussion.—It will be seen from (Table III) that parenteral DDS from the first 12 months gave the same result as that of oral DDS for 17 months. Two of these negative cases in the latter group were only very slightly positive to *L. bacilli* when they began treatment.

After another 12 months' treatment i.e., 24 months of parenteral treatment only 4 (3%) became negative to *L. bacilli*, 68 or 57% had slightly improved and only 5 or 3.7% had become worse, while with an average 29 months' oral treatment, only 2 or 2.4%

had become negative and 27 or 32.5% had improved moderately and 7.2% had become worse.

This shows that inspite of the equally quick absorption and an equally high concentration of the drug in the blood, there may be some other unknown reasons, which would account for the better results obtained with parenteral over the oral route.

Depot formations are due mainly to the hypersensitiveness of some patients to DDS and to the quality and concentration of the drug. A 20% suspension of the powder as fine as No. 3 sample may be used without any difficulty. A 10% suspension of the powder of the grade in sample 2, minimises the trouble of depot formation, gives less pain and is absorbed more quickly than a 20% suspension. The black particles found in sample 2 were probably responsible for depots and the suppuration noted in many cases.

Summary.—The method of use of DDS has been discussed, 24 months' treatment with DDS suspension parenterally has been compared with 29 months' treatment of oral use and the results are discussed. The vehicles used for making the suspension, are not responsible for the depot-formation. A fine grade of powder of DDS was found to be easily absorbable even up to 20% suspension. A 10% suspension of a less fine grade of DDS was also found suitable. Hard black tiny particles present in certain samples of DDS were found to be the cause of depots particularly the suppurative ones. Individual susceptibility is also responsible to some extent for the development of depots.

Conclusion.—Parenteral use of DDS in cocoanut oil suspension was found to be better than oral administration. Here the cost is much less if the trouble of injecting is not taken into account. A chemically pure fine powder of DDS should be selected to eliminate needless and avoidable troubles. The accepted standard method of sterilization gives adequate protection against sepsis.

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Atrophy of Testis in Leprosy

Grabstald and Swann of the U. S. Public Health Hospital, Carville studied the urological features in 179 male patients with leprosy, and found that 50 or 28% had testicular atrophy and 34 had gynæcomastia. —(*Jour. Am. Med. Assoc.*, 149: p. 1287: 1952).

INDUSTRIAL HEALTH PROBLEMS*

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THE relation between certain diseases and occupations has been recognised for a long time. In fact, some diseases and conditions go by the name of the occupation responsible for it, e.g. "Wool-sorters' disease" better known as Anthrax "Telegraphists' Cramp" and "Miners' Nystagmus." Poisoning by metals and non-metals like lead, mercury and phosphorus, and the different types of pneumoconiosis acquired in dusty occupations are also well known. Industrial medicine relates to the recognition and treatment of such diseases as arise in trades and factories. The industrial physician should therefore, be in a position to understand and appreciate to what extent and at what stages, the occupational troubles arise. He should also be quite conversant with the legislative and other enactments by the state that relate to the hygienic and sanitary standards, e.g., the Factory Act and the Workmen's Compensation Act etc.

The conditions that obtained in Factories and Industrial concerns in the western countries before these acts came into force, were most unsatisfactory. The main object of the employer was to make as much money from the industry as possible regardless of the health of the workers. There was no restriction in the hours of work or the age of the workmen employed and proper medical facilities were not provided. Nothing was done in cases of injury or sickness arising out of the occupational hazards. All such cases were explained away on the principle of incidental risk and contributory negligence on the part of the workers. Even when compensation was paid it was very meagre and thoroughly inadequate. When explosions occurred in coal mines due to 'Fire-damp' and a batch of persons died it was merely set down to the unavoidable risk incidental to that occupation. Constant agitation by the workers, and by social-welfare bodies made the State pass various enactments from time to time, e.g., the "Factory Act" and "the Employers' Liability Act" which later became the "Workmen's Compensation Act, which was passed in 1910."

Similar enactments were made in India. In Mysore, we have the Workmen's Compensation Act of 1928 as amended in 1936 and the Mysore Factories Act of 1936.

Apart from the protection afforded by these Acts, some of the progressive industrial concerns in India, following in the wake of the western countries, have instituted several schemes and devices for preventing accidents and sickness in industries; this would enable them to avoid paying heavy compensations, and increase the output

from the factories, as a result of ensuring better health and better working conditions. In America, they have the Sickness and Accident Insurance schemes. In India too, a beginning has just been made as regards compulsory state insurance for industrial workers.

We shall next consider the scope and working of these enactments and how they are of interest to the industrial physician.

A. *The Factory Act* provides among other things, for:—(1) sufficient floor space to avoid overcrowding of machinery; (2) guarding of moving parts like belts and wheels of pans containing corrosive or hot liquids, and guarding of sumps; (3) sufficient air-space for the workers; (4) adequate lighting and ventilation; (5) sanitary conveniences; (6) the provision of first-aid; (7) the provision of adequate and safe drinking water and canteen supplies. In addition to these, there are certain other specifications applicable to particular industries, e.g., the humidification of the atmosphere in textile mills. The Act also lays down what are known as "limits of impurities" in respect of dust, fumes, gases, etc. in certain industries.

B. *The Workmen's Compensation Act* provides for compensation to workers for injuries due to accident and occupational diseases. Injury to artificial limbs and aggravation of a pre-existing disease are also compensatable. Each state has a schedule of its own; but the following are generally speaking compensatable:—

(1) Poisoning by lead, mercury and arsenic; (2) by phosphorus, (3) by carbon-di-sulphide; (4) by benzene and its homologues; (5) ulceration due to chrome and manganese; (6) poisoning by nitrous fumes; (7) anthrax; (8) epithelioma and corneal ulcers caused by tar; (9) compressed air sickness or Caisson's disease; (10) cataract in glass and molten metal workers; (11) miner's nystagmus; and (12) inflammation and ulceration due to X-ray and radio-active substances.

II. Hazards in Industry.—Hazard is the term applied to risks in industry. We have general and special hazards. General hazards like injuries, fractures, etc., can occur in factories as in other circumstances. The prevention of contributory factors is important. The special hazards may be considered under the following heads:—(1) dust; (2) gases, fumes and vapours; (3) heat and humidity; and (4) hazards in the handling of chemicals.

1. *Dust*:—Dust is raised in various processes of industry like grinding, mixing, sieving, charging into furnaces, loading and unloading. Apart from the special chemical action of some of the dusts, the general effects are conjunctivitis, sore-throat, bronchial and lung affections, and in some cases dermatitis. The action of any dust depends on: (a) the density of the dust (expressed usually as so many million particles per cubic foot of air); (b) the particle-size (expressed in microns); (c) the shape of the particle; and (d) its solubility and chemical action. Soluble dusts when inhaled exert

* From an address delivered to the Mysore Medical College Union.

a chemical action on the mucous membrane of the nasal and upper respiratory passages producing local effects. The shape of the particle determines the amount of irritation produced. Insoluble dusts constitute a grave problem in industry. Dust-counts and particle-size-determinations, help in assessing the capacity of a particular kind of dust to produce a particular type of pneumoconiosis. A dense dust will cause trouble earlier; the smaller the particle the greater is its penetrating power.

To illustrate:—Though both silicosis and asbestosis, essentially produce a fibrosis of the lung, their modes of action are different; in silicosis it is chemical and in asbestosis it is mechanical. The asbestos particles which are larger in size and shape (more than 10 microns) block the finer bronchioles of the lung. Silica dust will induce a typical silicosis, only when the particles are well below 10 microns.

The composition of any dust is important because there may be more than one variety of dust each having a distinct and separate action. Anthra-silicosis, and combination of silicosis and siderosis are instances. Dust also predisposes the lungs to ordinary respiratory infections and to tuberculosis; some organic dusts like cotton, wool, silk etc. produce allergic states, like asthma and urticaria.

2. *Gases, fumes and vapours*:—Gases like SO_2 , H_2S and oxides of nitrogen issuing from fuming nitric acid, HCl gas, etc., produce lesions of the respiratory tract, irritation of the eyes and throat, head-ache, loss of appetite and a serious impairment of the general health. The extent of the lesion will be proportional to the concentration of the gases etc. and the duration of exposure thereto. Prolonged exposure to nitrous fumes may lead to pulmonary fibrosis. Ammonia in high concentrations is highly irritating to the eyes and will start severe upper respiratory troubles.

3. *Heat and humidity*:—Heat generated in industrial processes is often enormously intense and is very exhausting to the employees working in such places. They perspire heavily and if they are wearing unsuitable clothing may catch a chill later. Prolonged sweating leads to loss of chlorides which in turn may lead to heat-cramps. Sodium chloride tablets with or without glucose should be supplied to the workers in such factories.

Humidity is water-vapour present in the atmosphere. The humidity of air in some industries e.g., textiles is increased, sometimes due to evaporation, leakage of steam, etc. When the air gets saturated with water-vapour in a closed space, where there is also not adequate circulation of air, work becomes very exhausting and heat strokes may be caused.

4. *Action of chemicals*:—Some chemicals may produce injuries during handling or transport: (a) burns due to mineral acids; (b) necrosis due to strong alkalies and corrosives; and (c) dermatitis due to tar and cement.

Safe limits for impurities in certain industries have been fixed:

Dust:—(a) Asbestos—5 million (5 to 10 microns).

(b) Cement—15 million.

(c) Pottery—4 million (25 to 75%) (this again depends on the silica content).

Gases and vapours	p.p. million	Gases and vapours	p. p. million
(1) Ammonia	100	(8) Hydrofluoric acid	3
(2) Carbon-di-sulphide	15	(9) Hydrogen-sulphide	20
(3) Carbon-monoxide	100	(10) Oxides of nitrogen	10
(4) Carbon-di-oxide	5550	(11) Sulphur di-oxide	10
(5) Chlorine	1	(12) Lead (fumes and dust)	0.15 milli-
(6) Gasolene	1000		grams per cubic
(7) Hydrochloric acid	10		metre of air)

Protective measures.—Various protective measures and safety appliances have been devised to prevent and to minimise industrial hazards. As a proper understanding and the correct use of these are essential to obtain the maximum benefit, workers must be trained in them.

Safety devices in use:—(a) Gloves and rubber boots—while handling or working with corrosives, acids and alkalies. (b) Rubber overalls to prevent injury from spurting corrosives and chemicals. (c) Goggles while engaged in welding, in order to protect the eyes from incandescence and also the spurting of chemicals. (d) Gas masks against gases and fumes. (e) Dust masks. (f) Asbestos clothing—for fire fighting. (g) Ear defenders—Against excessive noise.

Medical and health work.—Apart from the routine medical work in connection with general illnesses, the industrial physician should (a) organise first-aid classes and train personnel; (b) carry out medical examination of candidates prior to employment; (c) periodically examine workmen at intervals in order to detect group or individual illnesses and also; and (d) maintain statistics and records of accidents, sickness and absenteeism.

Social and welfare work.—The industrial physician will also have to inspect canteens, test the physical capabilities of persons for specialised precision jobs, suggest alternative jobs for disabled persons and educate the employees in matters relating to the averting of accidents and in the use of protective appliances.

Industrial medicine in India has not yet received the status and attention it deserves as a separate and specialised branch of medicine.

Reliable statistics and case-reports, on the various industrial and occupational illnesses are greatly lacking. The scope for planned study and research in industrial medicine is therefore, very great and signs are not wanting that greater interest is beginning to be evinced by the State and by the industrial and social welfare organizations in our great country.

FOOD CONCENTRATES*

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DURING recent years and especially during the last war, there were a number of new developments in regard to the production of food concentrates. The subject has now assumed considerable importance and the application of some of the recent findings will be of great value to our country.

The average person pictures a food-concentrate as some sort of tablet or pill which would meet all our requirements. It has even been occasionally reported that the entire requirement of an adult for a month or two can be carried in a small tin or carton. These reports are unfounded. The human body is so constituted that, while some of the requirements can be easily concentrated, we require other forms of bulky food both for energy purposes and for the normal functioning of our system. Without such bulky foods, our efficiency and health *will* suffer. Moreover, it cannot be denied that much of the pleasure we derive, in our limited span of life, is through eating a variety of good food, attractively prepared and served. Concentrated foods, as the scientists picture them, have however an important place, even in our daily menu, besides being of great value in certain walks of life and also in emergencies.

The food habits of people in different parts of the world are determined, to some extent, by the climatic conditions, but to a larger extent, by the food material available in the region and the economic condition of the consumers. In almost every country—and more so in densely populated countries like ours—certain food materials are abundant, while others, which are quite important, are generally deficient, if not totally absent. A substantial portion of the Indian diet—particularly the South Indian diet—is predominantly starchy and deficient in proteins, minerals and vitamins. If the necessary food supplements are not provided, both growth and general health are affected. To meet deficiencies, we should provide the supplements in a concentrated and compact form which may be easily added without affecting the food habits of the people. This is one of the directions in which food concentrates play an important role. There are also other conditions where we have to make up for gross deficiencies in the shortest possible time, failing which some serious disorders may set in. Quite a number of diseases belong to this category and they can be treated by using massive doses of certain food concentrates.

Foremost among our requirements, come the proteins, but the best known among them—milk, meat, fish, eggs etc., are

* From a broadcast talk from All India Radio, Madras, on 24.6.53. Thanks are due to the authorities for their kind permission to publish it.

very costly and beyond the reach of a large section of our people. These forms are plentifully available in certain restricted regions, but, being perishable, they will either have to be consumed on the spot or transported under special precautions. If, however, we can concentrate them into stable forms, we can then conveniently pack, transport and store them for reasonable periods. One of the best known methods of concentration is dehydration which involves the efficient removal of water. The process, though still not perfect, was applied during the War, but we have since given it up in our country. Other countries are keeping up the line and several improvements have been made during the last few years.

Another method of concentration involves the preliminary extraction of protein from cheap sources, which could not be utilized as such. In this category we have a variety of seeds, especially oil-bearing seeds, grasses and other leafy materials—especially those of leguminous origin—certain varieties of fauna which are not normally edible, meat offal and such others. Defatted oilseed flour, leafy protein concentrates, and odourless fish flour are some of the best known concentrated food products. So far as India is concerned, groundnut and cocoanut are two of the best known sources of concentrated protein food and the necessary methods of producing them have already been worked out. We have only to apply the existing knowledge on a large scale and we will have a few hundred thousand tons of highly concentrated protein food which is several times more rich than our normal cereal diet.

Another type of concentrated food is derived from those which are classed as non-edible materials which are associated with bitter principles or certain harmful ingredients. In this case some simple preliminary processing is needed before concentrating the product. Even some of the so-called poisonous seeds or fish can be processed to yield quite wholesome concentrated foods. In this category we have the cotton-seed kernel, Burma bean (popularly known as Rangoon Mochai) *lathyrus sativus* (also known as kesari) and several forms of marine fauna which are caught during fishing but rejected as unedible.

The human body can utilize only certain elaborated forms of nitrogenous foods. On the other hand, certain lower forms of life can utilize even inorganic or mineral nitrogen and convert them into proteins. All members of the plant kingdom are capable of doing this, but only slowly. On the other hand, there are certain lower forms of life like certain yeasts which can convert ammoniacal nitrogen into edible proteins in the course of a few hours. This is the basis for the production of food-yeast, which usually contains 40 to 50% protein. There are also other forms like the algæ, which in conjunction with yeast can utilize even the

carbonic acid of the air and help to produce concentrated protein without much trouble or expense to us.

Besides the above, there are certain coarse and low grade forms of food which cannot be utilised by the rather delicate human body. Many of the domestic animals such as pigs, poultry, cow, buffaloes, goats, etc., can utilize them and convert them into more valuable and concentrated foods in the form of their body tissues, eggs and milk. This constitutes the scientific basis for our maintenance of the domestic animals. Among these, pigs and poultry are the most efficient. Certain lower forms of life can convert even waste materials like sewage into forms of food which can be utilized by various higher animals, if not immediately by man. This is a line which has not so far been developed.

It is not always that a concentrated food can be used as such by man, especially during illness. In such cases, we will have to pre-digest them before concentration. There are quite a number of such products on the market and they are steadily becoming popular.

Mineral foods.—In almost every country, the diet is deficient in some essential mineral or other. In our country the foods are usually deficient in almost every mineral and more especially in calcium and phosphorus, which are very necessary. Deficiencies of magnesium, sodium, potassium, copper, iron, cobalt, manganese, molybdenum, iodine, etc., are also known to become limiting factors in growth or to produce certain disorders. All the minerals are available in concentrated forms, but many of them cannot be either utilised as such or they will produce certain secondary effects if taken at high concentrations. The most satisfactory procedure will be to evolve different mineral mixtures, to be mixed with different types of diets in such an efficient manner as to have them distributed over a large volume of food. From this point of view, common salt, which is used as a part of our diet, would be a satisfactory vehicle.

Vitamins.—The most spectacular advance in recent years has been in regard to the concentration of vitamins. In this field, human achievement has gone even beyond the best that nature can give us. The vitamins which occur in very minute quantities in different foods have not only been concentrated thousands of times but man has even succeeded in producing them as pure substances starting with relatively simple chemicals. A recent achievement is the synthesis of vitamin A which now dispenses with the need for handling the smelly fish liver oils. The daily requirements of all the known vitamins have been worked out and in certain cases quite massive doses are required. Vitamin concentrates can be taken not only by the mouth, but also by means of injections.

Considerable advance has been made in regard to the concentration of fruits and vegetables without spoiling their flavour,

or nutritive value. Freeze-drying of even soft and delicate fruits like the strawberry has been successfully achieved. Vacuum concentration of fruit juices has been developed to such a high standard that in some of the countries, the concentrates are actually preferred to the fresh fruits themselves, which are bulky and inconvenient to handle. The concentration technique has also been successfully applied to various meat juices, protein hydrolysates, milk and malt products.

Specially concentrated food packs are being evolved for the use of troops, mountaineers and others who cannot carry very heavy loads. Many of these preparations do not need cooking.

During the past three years, the Central Food Technological Research Institute, Mysore, has prepared a number of concentrated food preparations and also demonstrated their uses. Among them special mention may be made of concentrated edible flour from groundnut, processed casein foods and fruit-juice-concentrates. Some of the preparations have been made out of materials which are abundantly available but have not so far been utilised to advantage. While scientists can demonstrate the possibilities, the co-operation of the public and industry is required in extending the use of such products to afford the maximum benefit to the people.

Dietary Modification of the Metabolic and Clinical Effects of ACTH and Cortisone

A patient with rheumatoid arthritis when given a pure fat diet was found to excrete only half to a third of the expected amount of urinary 17-ketosteroids during the administration of large amounts of ACTH; while on the pure fat diet none of the common undesirable clinical effects of large doses of ACTH developed and there was a complete remission of the rheumatoid condition. When a mixed diet was given, manifestations of Cushing's syndrome developed, though the Na intake was restricted and adequate K was given. A second patient with rheumatoid arthritis who had become resistant to ACTH so far as the rheumatoid condition was concerned and showed many of the undesirable clinical effects of ACTH administration was given a pure-fat or a high-fat and low-protein diet; he became tolerant of large doses of ACTH and his urinary 17-ketosteroid excretion fell to less than 10 mg. per 24 hours. During this treatment there was great clinical improvement and signs of Cushing's syndrome disappeared. The addition of more protein to the diet increased the 17-ketosteroid excretion, but the clinical improvement was maintained. The addition of carbohydrate to the diet increased excretion of 17-ketosteroids and the undesirable clinical signs reappeared.

A ward study led to the conclusion that Na intake should be limited in all patients treated with ACTH or cortisone, and if large doses of the drugs are given, the Na intake should be less than 300 mg. daily. Protein intake should be high to meet the protein catabolism produced by cortisone and ACTH, and the diet should yield sufficient calories to meet the energy requirements of the patient. Finally, unless renal insufficiency is present, the patients during treatment with ACTH should receive 4 to 12g. K-daily.—*Nutr. Abst. Rev.*, April 1953 and *Ann. Int. Med.*, 37, 921-929.

RESEARCH IN AYURVEDHA*

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I OFFER my heartfelt thanks to the Reception Committee and particularly to the literary section for inviting me to preside over this Anusandhana Parishad. I was a little hesitant about accepting the invitation to preside over this section of the conference, for I do not claim to be an expert in the great and limitless science of Ayurveda and I knew that those that participate in this conference are men of profound learning and experience and each an expert in his own branch of this ancient science. Nevertheless, the desire to meet you all, collaborate with you and thus serve the cause of scientific research in this age-old science, impelled me to accept this honour for which I have no other inherent claim. My services to the cause are meagre and of recent origin. But this occasion will inspire me to greater and more intensive endeavour in order to justify the trust reposed in me by the learned scholars and vaidyas assembled here.

The scientific spirit of the age.—Many are under the impression that research means re-search i.e. searching or investigating once again what was achieved before. But the truth is that 'Re' here does not mean 'again' but it indicates intensive search, so the term research means just intense search or careful and critical inquiry or investigation and may be translated as :

(अनुसंधान) or (परिशोधन) which means laborious and learned investigation and purification, thus selecting useful and verifiable portions and isolating the true and verifiable truths and principles which stand the scrutiny of scientific interpretation and coordination.

We live in an age in which the spirit of science pervades every aspect of life. We are enjoying the fruits of experimental and industrial science. Our communications and travel facilities, our home comforts such as power, radio and many labour-saving devices are the products of modern science. Modern medicine is the result of experimental and scientific investigations and from that aspect different from classical medicine. In the last half a century, scientific methods and experiments have changed the lives of people beyond recognition. This is the result of the industrial revolution. Against this fact no one can successfully fight and appeal to people to be merely sentimental and bow down respectfully to the age-old methods and theories on the mere ground of their being age-old or even being our own. The coming together of the peoples of the world, and the great economic and political upheavals that have occurred broke down the barriers which separated one nation from

* Presidential Address at the Anusandhana Parishad of the 38th All-India Ayurvedic Conference, held at Indore in October 1952.

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another and there is today a growing sense of the unity of mankind. Thus the merely patriotic appeal falls on deaf ears and people are not in a mood to accept anything inferior simply because it is their own in preference to something superior and more efficient which is not theirs.

This is a good and healthy sign indicative of the progressive age and even our ancients respected this large and catholic view, when they said " :

अथं निजः परो वर्ति गणना लघुचेतसाम् ।

उदारचित्तानां तु क्षुधैव कुटुंबकम् ॥

"Distinctions like mine and yours, are made by men of little minds, while the whole world is their own home to large-hearted persons."

Science has made this universal outlook possible. Narrow patriotism and self-complacency, and a chauvinistic spirit are out of place in the world of today, and we who want our ancient science of Ayurveda to be duly appreciated and acknowledged not only in India but by the whole world, should present it in universal terms and show its quality and efficacy in the unmistakable language of modern science. We should not fight shy of this new language for that is the only language that the world of today understands and acknowledges.

It is indeed a trying time for Ayurveda from which it is sure to emerge victorious, as the wisdom and vision of the ancient seers are based on intuition which the intellect and reason will endorse.

The work of research cannot be done by a few individuals alone or in isolation. It requires the co-operation and the co-ordination of effort in various fields, from numerous individuals and institutions, of clinicians or vaidyas well-versed in the science, having an unbiased and open mind, of botanists, chemists, biochemists, pharmacognosists, pharmacologists and pathologists. Research work should be carried out in close mutual collaboration and the data obtained placed before the world without fear or favour. The spirit of Research must be one of the greatest respect for truth and truth alone. No prepossessions or prejudices should be allowed to come into play. They must be like the Aptapurushas described by Charaka (निष्प्रीति - उपताप - दर्शिनः) "free from the evils of attachment and passion."

Immediately after the intuitive age of the Vedas and the Upanishads, there came a period of renaissance in ancient India wherein every truth was put to practical test. Revelation and authority became a secondary or tertiary *Pramana* and *Pratyaksha* or sense-perception and practical demonstration became the supreme primary test. The thinkers of the Sankhya schools started this

tradition which was a bold departure from the path of blind submission to authority and stated their *Pramanas* thus :

दृष्टमनुमानमाप्तवचनं च सर्वप्रमाणसिद्धत्वात् भिन्नं प्रमाणमिष्टम् । सां. का. ४.

In spite of the fact that inference and reasoning are the most important feature of its growth, modern science takes its stand on the experimental methods and the statistics derived from practical results. Whatever is not experimentally demonstrable, however sound its intrinsic logical validity may be, is not taken to be ultimately true or valid. It is even more so in medicine, where what matters is the practical result obtained in the treatment of patients. "Thus, experimental science has three great prerogatives over other sciences, viz.,

- (1) It verifies conclusions by direct experiment.
- (2) It discovers truth which would otherwise never be reached.
- (3) It investigates the course of nature and opens to us a knowledge of the past and of the future." (Osler).

The great Vagbhata belonged to an age of renaissance in the middle ages, similar to the one occurring today. His great utterance :

ऋषिप्रणीते प्रीतिश्चेन्मुक्त्वा चरकमुश्रुतौ ।

भेदाद्याः किं न पठ्यन्ते तस्माद् ग्राह्यं सुभाषितम् ॥

"If books are to be highly regarded, only because their authors are ancient sages, then why are Bhela and other authors not in vogue ? Therefore, one should prefer whatever is well propounded," born in our own day, he would have been the first to take up the modern challenge of research and submit his science to the test of experimental verification.

I wish to make it clear that if we do not open our eyes to the realities of the times in which we live, and keep pace with them, the world will leave us behind and go forward without us. We know that experimental science is holding great sway over all departments of knowledge in life ; and we are called upon to prove our bonafides, our strength, soundness and our work before the world, as judged by this universal criterion. If we want to be accepted by all, we must go forward boldly and accept the challenge ; otherwise we may be ignored and by-passed. Not idyllic but a spirit of scientific research should be our guiding star now.

The need for change :—In this address I can give only a general indication of the vast amount of work that lies ahead in the as-yet-unexplored region of research in Ayurveda. The workers in this field have to face an eager world which demands to know the verdict of scientific research on the important aspects of our ancient system of medicine, Ayurveda. We are today living in a

world where every aspect of life, presents a changed outlook as a result of the achievements of modern science. If Ayurveda has to reestablish its supreme position in its pristine glory it will have to satisfy the tests of modern science.

In a rapidly changing world, we have all to live by readjusting our habits, ideas and codes of conduct. Ayurveda is a most ancient code of medical wisdom and for thousands of years our people have grappled with disease by using the weapons put into their hands by ancient sages and scholars. For ages our sacred scriptures have been handed down from mouth to mouth. To-day we have them recorded in books and we have often dispensed with the traditional Guru for learning the contents of these books. We now aim at universal education and rely on printed books and libraries and on class teachers who have taken the place of the ancient Guru.

Similarly in medicine, the physicians should first understand how to deal with modern man, with the critical mind, the high standard of enlightenment, and the altered social environment compatible with the scientific spirit of the age. I would appeal to all to take a realistic view of things and not to be carried away by mere sentiment. Modern science, which we have learnt from the west, has come to stay as an undeniable fact of our daily life. The results of its achievements are influencing us, in our diet, clothing, health, social hygiene and in our travels and communications and generally in all our domestic and social lives. Modern medical science with its germ theory of etiology, its antibiotic drugs for treatment, its vaccines and sera for conferring immunity, has already been firmly introduced into our country.

A large section of the population has become naturally attached to its methods and means and start instituting comparisons when the claims of the ancient system of Ayurveda are pressed. Almost the whole world has taken the modern system of medicine as the standard and learnt to measure every other system with this yardstick. We might refuse to be judged by the standards of western science if we had remained entirely free from its influence from the very beginning. But, we have adopted its methods and means and we have fully benefited by its inventions and discoveries and have enriched our daily lives with its achievements. It would therefore, be hypocritical on our part to refuse to acknowledge its general usefulness in our lives, or to adopt its methods to ascertain and establish the value of our ancient medical traditions. There is indeed, nothing derogatory nor incongruous to the genius of our hoary traditions in doing so. Our great *rishis* and *munis*, and sage scholars of old had a truly scientific spirit and never accepted anything unless its theoretical and applied validity and fruitfulness in life, were truly established.

Experts have held that articles of diet that are of a pleasing colour, smell, taste and touch, taken systematically constitute the

life of all living creatures. This view is the result of practical observation. (*Char. Sutra*, 27, 3).

"That is *pratyaksha* or practical observation which yields the direct perception and demonstration of a truth."

इष्टवर्णगन्धरसस्पर्श विधिविहितमन्तपानं प्राणिनां

प्राणिसंज्ञकानां प्राणमाचक्षते कुशलाः, प्रत्यक्षफलदर्शनात् । च. सू. २९, ३

यत् किञ्चित् एव अर्थस्य साक्षात्कारि ज्ञानं तदेव प्रत्यक्षम् ।

Modern research or experimental science carries that (प्रत्यक्ष फलदर्शन) practical observation to its logical conclusion and it is only when an adequate number of cases have proved the value of either a drug or a manipulation or a theory, that it is accepted as reliable.

The arrangement by which the (प्रत्यक्षफलदर्शन) practical observation is controlled, so as to eliminate all factors due to changes and accidental coincidences and other possible snags in a given situation, is called research. It is an exclusive process by which every individual factor in respect of, say, a cure is thoroughly controlled and ascertained without any doubt or ambiguity. This establishes the certainty of our knowledge about the quality and quantity of a drug and its constituents and of the different pathological conditions of the patient; unless such absolute definiteness is established, modern man is not inclined to rely or place faith on any system of cure.

Recurring Renaissance.—There is one point on which I would like to dilate for a bit. It is generally believed that in the ancient past, people were all conservative and did not break away from their past tradition. But the truth is otherwise. The *Upanishads* and the *Gita* are saturated with a spirit of revolt against established religious and social traditions. The Sankhya philosophers did not accept (आनुश्रविक) which is the Vedic tradition and disputed its claim to authority.

दृष्टवदानुश्रविकः स त्वविशुद्धिक्षयातिशययुक्तः सा. का.

"Revelation is on a par with what is seen, for it is fraught with impurity, decay etc." (*Sankhya karika*).

It is not enough, if the mere effort of inquiry is sincere and intense, in guaranteeing the correctness of the results. The method and procedures adopted must be sound, adequate, rational and consistent with the fundamental facts of physical and biological laws of the universe. The first such positive scientific effort was made by the Sankhya thinkers. They emphasised the necessity of scientific knowledge (विज्ञान) and the following verse from the

Charaka Samhita will ever remain the arch-aphorism and the guiding principle of all inquiry.

समग्रं दुःखमायत्तमविज्ञाने द्रव्याश्रयम् ।

सुखं समग्रं विज्ञाने विमले च प्रतिष्ठितम् ॥ च. सू. ३०, ५४

"All suffering, having its resort in the body as well as in the mind, has for its basis ignorance, while all happiness has its foundation in pure scientific knowledge." (*Char. I: 30-84*).

Again came the revolt of the Buddha and the Jina. Similarly in medical tradition, Charaka, Susruta and Vagbhata being full of a spirit of renaissance, incorporated new ideas and methods while retaining all that was valuable in the past. What happened in the 16th and the 17 centuries in Europe, when Copernicus, Galileo, Bacon and other scientists and thinkers exploded the other concepts of the world and discovered its real nature, is well known to students of history. Modern experimental science revolutionised and altered most of the medieval concepts. Particularly in medicine the knowledge of germs, the use of X-ray, radium and the discovery of antibiotics, hormones and various synthetic drugs have made the people sceptical about the old classical concepts of disease, its causation and treatment.

The concept of Ayurveda.—It is now the task of Ayurveda to show that all these have not *really* changed the basic truths relating to man. Ayurveda takes its stand on the concept of man as a whole, an organic unity influenced by the three basic integrative organizations of the triumvirate forces of *vata*, *pitta* and *kapha*.

Our research should therefore, be directed towards proving that changes in therapeutic agents and methods do not change the basic fact or situation about "*Man*". And our researches should establish how modern developments, discoveries and inventions may best be fitted into the basic frame-work outlined above.

An intimate knowledge of Ayurveda will convince the practical clinician of its immense value in the matter of early diagnosis i.e. long before any actual structural and deep-seated functional disorders have crept into the organism, as well as in the procedures of active immunization and prophylaxis. The daily diet and behaviour of the individual and his continual adjustment to the demands of the changing environment, are to be built upon the facts of constitutional peculiarity (प्रकृति). The details of normal living, as also the exigencies of therapeutics are to be patterned in the light of the fundamental diathesis which provides the key to allergic reactions and psychic and somatic idiosyncracies. This aspect of medicine is thus all important to the clinician and Ayurveda with its various branches, is like a wheel whose spokes are fixed firmly

and converge to the navel of the concept of the three doshas (त्रिदोष). Thus it is, that this physio-pathological perspective is all-embracing in its scope and deserves the most intense and searching scrutiny by the modern medical scholar. It is only then that its soundness as a faithful representation of bodily organization and functioning, and the extent of its practical utility and applicability can be properly appreciated. It is therefore, a subject for intensive study and considerate judgement by the sincere and serious-minded student of medicine.

We must therefore, eagerly welcome this opportunity to utilise modern methods to reorientate and reestablish the basic truths which form the bedrock of Ayurveda.

The advantages of practical observations in medicine are thus laid down by Vagbhata :

विनिगूढार्थतत्त्वानां प्रदेशानां प्रकाशकः ।

युगानुरूपसंदर्भो विभागेन करिष्यति ।

It reveals the secret truths and contextual sense (of text books). That books and the knowledge contained therein have to be recast to suit the changing times is also declared. "The books are reedited and classified to suit the changed conditions of each age." This is the only way that ensures its survival and acceptance by the world.

Universal outlook.—Ayurveda is not the science of medicine meant only for one country and its people viz., India. It is meant for mankind as a whole. So it must be reclothed in the world's language from age to age. I therefore, earnestly appeal to all true lovers of Ayurveda to embrace this broad and universal outlook and offer its benefits to as a whole humanity. The only way to make it universally acceptable is to subject it to modern methods of research and allow its truths to be recast into the newer ideological moulds and make it convincingly intelligible to the modern enlightened mind.

Scientific truths do not and cannot possibly vary with the orient and the occident. Theories and hypotheses and methods of approach may differ, but scientific facts and truths being always the same, will not permit of differentiation to suit eastern and western. Wherever knowledge is imperfect, as it undoubtedly is in the case of medical science, such differences of opinion and theories are inevitable; but no true scientist, eastern or western, would ever reject a proposition merely because it is advanced by one born or living in a country different from his. On the contrary, if it is proved that the other view is better than his own, he would have no hesitation at all in accepting it with candour.

Research scheme in outline.—The learned scholars assembled here will, I am sure, give you their views on the details of the

research work to be done in the various branches of the science. I shall therefore, only briefly indicate the broad outlines of this comprehensive task.

The important branches of the science in which intensive research is urgently called for are :—

1. *Botanical and zoological research* :—Representative scholars and vaidyas from various parts of India should meet, compare specimens of botanical and zoological interest described in the ancient texts of Ayurveda and determine once for all the nomenclature of the flora and fauna of the country. This preliminary work should come before all else.

2. *Pharmacological research* :—(a) A team of experts should examine the easy availability of drugs by surveys conducted in each region.

(b) The pharmacological action of each drug should be systematically studied as under :—Available references from all ancient and modern texts to be collected, collated and classified. The *pancha mahabuta* and *rasa guna veerya* and *vipaka* should be tested by using standard methods that are to be devised in collaboration with modern chemists and biochemists.

(c) The action of the drug according to modern pharmacological technique should also be studied and correlated with *pancha mahabhut*, and *rasadi*, and *tridosh* concepts.

3. *Pharmaceutical research* :—All pharmaceutical operations should be done under the supervision of a team of expert vaidyas representing the various provinces along with two expert pharmaceutical chemists and the operations should be interpreted in terms of modern pharmaceutical assays and the methods then standardised.

4. *Pathological research* :—The action of all bacterial or pathological factors should be interpreted in terms of *vata*, *pitta* and *kapha* which are the basic pathological factors in Ayurveda.

5. *Clinical research* :—Clinical investigation methods should be standardised and the clinical history of thousands of cases should be carefully collected using both the normal senses and the modern instrumental aids so as to obtain a complete picture of the patient's personality as well as his disease, (आतुरबलप्रमाणपरीक्षा) and (आतुरदोषप्रमाणपरीक्षा). These data should be evaluated in terms of both Ayurvedic and Allopathic medicine. In clinical investigations particular attention should be paid to climatic and dietetic factors.

6. *Literary research* :—(a) Redaction of the main classics of Ayurveda, such as Charaka, Susruta and Vagbhata: to begin with, all available manuscripts and printed editions of these should be collected; after collation of the texts, a standard authoritative version of each of these should be published.

(b) An Ayurvedic medical dictionary, without omitting of any reference from any of the standard works and their commentaries should be compiled under the guidance and scrutiny of a specially qualified and representative body of scholars and vaidyas.

(c) Text books on the different branches of Ayurveda should be prepared by highly competent men for use in educational institutes teaching Ayurveda.

7. *Pharmacopoeia research*:—A standardised Ayurvedic pharmacopoeia to include all the drugs, recipes, formulæ, procedures and methods of preparation and all other relevant information in detail should be prepared.

8. *Collection of books and manuscripts*:—The collecting and cataloguing of manuscripts and printed books is indeed a very onerous task. In the first place Ayurvedic literature in Sanskrit and all other Indian vernaculars should be collected. There are manuscripts lying stowed away in obscure corners, and left to rot there. There are vernacular renderings of Sanskrit works, of which the originals are not available. A classified catalogue of all medical works, printed or manuscript existing or reported lost should be prepared. A regular library department with branches all over the country should be opened for the collection and preservation of such books and manuscripts. Such of these as deserve publication should be published. Old Dravidian literature does not appear to have so far been tackled by scholars.

As already stated, no intelligent systematised and intensive work appears to have been done in the pursuit of Ayurveda during the past four or five hundred years and naturally therefore, much work awaits to be done. We should start research laboratories and institutes for analyses, assays, and experiments and also for the preparation of Ayurvedic medicines. We should start the cultivating medicinal herbs and open museums and research institutions for them. Many schools, and colleges should be opened where Ayurveda shall be taught systematically in the light of modern knowledge and with modern equipment just as it was brought up-to-date in the time of Charaka, Susruta and Vagbhata. We must also start publishing suitable literature for the profession and the public.

Dietetic research.—In order to ascertain the action of the drugs on the human body, the great sages evolved the five determinants, viz, taste (रस) quality (गुण), potency (वीर्य) post-digestive effect (विपाक) and specific action (प्रभाव).

This system enabled them to study completely all the aspects of the drugs necessary for therapeutics. These drugs were chiefly administered through the natural channel of the mouth and hence the arrangement of *rasa* tastes came into prominence, the

sense of taste playing an important part in the oral administration of drugs. This arrangement and metaphysic of six categories of taste is a speciality of Ayurveda and it has been arranged so as to fit arithmetically in the *tridosha* theory. The properties and actions of inedible drugs were experienced by senses other than that of taste and so a comprehensive scheme of twenty or more kinds of properties was evolved which could be tested by other sense-organs. Some drugs acted more powerfully than usually expected and so (वीर्य) the potency of the drug became one of the determining factors. Another peculiarity of Ayurveda is its theory that the drugs while entering the body submit themselves to the process of digestion. As a background to this theory, the concept of Ayurveda that diet and drugs fall in the same category is worthy of attention. The *Upanishads* consider food also as medicine (अन्नं भेषजम्). The difference between diet and drugs is not fundamental; taste is the predominant factor in diet while potency is predominant in drugs and it is but a natural corollary of the system. It is on this sound fundamental basis, that Ayurveda forbids the administration of a second drug before the first one has been digested. Thus comes (विपाक) the post-digestive effect, the form that a drug is turned into after being digested and its action on the body; these form the subject matter of (विपाकज्ञान). Last but not least comes the specific action (प्रभाव) of a drug. A scientific explanation cannot be given for the specific properties of certain drugs, because they are beyond the ken of the present technique of science. When the knowledge of specific action attains perfection, there will be no need of research but so long as there is room for research, we must admit that our knowledge is incomplete.

As Ayurveda has conceived diet and drug as one, the properties and the actions of the substances that comprise our diet have been subjected to the same processes of study and exposition as those of the drugs. This is really the speciality and the peculiarity of Ayurveda.

Standardization.—The preparations should be made in accordance with fixed standards. We generally believe that standardization is the last word in modern medical science, but we must not forget that accuracy in measurement is the first step in scientific progress. "Logical reasoning for everything and accuracy" was the motto of the scientific age of India which began about 600 B.C., and it is for this very love of accuracy that the science of logic (न्याय) and Sankhya came to be written. In an age when even the sequence of words in a sentence was strictly regulated and no word could be used without a definite purpose, laxity in the accuracy of measurement is unthinkable. Accuracy and exact measurement governed

not only medicinal doses, but even food was to be taken in measured quantities. The word (मात्रा) is derived from मा, i.e., 'by which it is measured', while the English word 'dose' is derived from दा to give. The English word simply 'gives' while the Sanskrit word 'measures'. This proves that accurate measurement was more strongly stressed in Ayurvedic medication.

Toxicological Research.—Toxicology is one of the chief branches of Ayurveda. We need not reiterate that the knowledge of toxicology in India was far superior to that of other countries. When Alexander invaded India (323 B.C.) he had ordered that whenever any treatment for poisoning was necessary, only an Indian physician should be called. This is but one evidence of the high level of perfection attained by toxicology in India. Poison girls (विषकन्या) are no fable. They were reared to be used against enemies. It was the practical application of the theory of immunization in the body by gradual and constant administration of poison. India abounded in poisonous animals and vegetation. Kings were always under constant vigilance against poisoning, and so a physician was always in attendance to protect the king against food poisoning. During wars, poisoning was resorted to for killing individuals, as well as for mass murders. The knowledge of snake poison was also profound. Venomous snakes were then, as now, plentiful in India and hence the knowledge about snakes and toxicology came to be special branches of study. The classification, description and identification of serpents are astonishing. Snake poison was used also as a medicine. Atreya prescribed it for the incurable condition of Tridosha Udara, largely a malignant growth.

The development of the science of toxicology was the result of varied experiments. The poisonous drug or poisoned food was tested by the senses, by fire, by mixing them with water and other substances, and also by administering it to beasts and birds. We find that about 25 animals, beasts and birds were thus made use of in such experiments.

Rasayana—a special branch.—The principal objective of the "Science of Ayurveda" is long life. That is why it is called by some "the science of longevity." (दीर्घ जीवितशास्त्र). In modern times the gradual control of epidemics and contagious diseases, the better understanding of dietetic principles, the control of famine and pestilence and the progress in other sister sciences have brought about the prolongation of the life-span and a fall in the world's death rate. But mere longevity is not enough. Long life without vigour, dynamic energy and robust outlook, will be a personal as well as a social misfortune. In the absence of proper systemic knowledge, great productivity and potentiality will be lost. Moreover, old age ought to be crowned with radiant wisdom if the man is not to be physically invalidated. Mature judgement, extensive knowledge,

experience and discipline come only with age. The world at present is in need of such men of wisdom as they alone can bring peace and happiness to the world.

Ayurveda has a message in this respect to the world at large. Charaka and other sages after him devoted their attention to longevity and to the prolongation of youth and retardation of old age. The procedures of Rasayana and Vajeekarana were propounded to help men to maintain biological youth, vigour, vitality and the creative spirit of enterprise and adventure in spite of chronological aging.

Biological science is progressing more slowly than the physical sciences. This disparity has created a new problem. Revolutionary changes in environment have led to a state of great stress and strain in the daily life of every individual.

Owing to this strain, there occurs much wear and tear in the various systems; and the lack of timely replenishment of lost energies causes premature senility. That is why men become prematurely old and show signs of fatigue and senility much before their time. In this Rasayana has a great part to play as a remedy to this preventable condition. Rasayana is meant to replenish lost energies, build up the worn-out tissues and create a new life that can stand further stress and strain and so enable man to continue a vigorous, joyous and useful life till real old age overtakes him in the natural course. This is therefore, a very important and fertile field for research.

Here is a great feature of Ayurveda which we to-day (स्वस्थस्तेर्जस्करं यत्, तद्वृष्यं तदसाधनम् ।) will do well to remember. Charaka says (च.चि.1/1—5) Ayurveda is not merely a curative science but is also a positive and creative science for promoting Health. It is only in recent times that the West has realized this great truth of the medical science, i.e., its part in the positive promotion of health. The object of medical science or of Ayurveda is to bring into the world men of sound and robust health of body, a cheerful benevolent and creative intellect and a good and righteous heart. It is the building up of such an all inclusive health of body, mind and soul that Ayurveda lays down."

हिताहितं सुखं दुःखमायुस्तस्य हिताहितम् ।

मानं च तच्च यत्नोक्तमायुर्वेदः स उच्यते ॥

Its mission is the giving of long life to men for the sake of cultivating goodness, virtue and wisdom. In this, the great science and art of Rasayana or vitalization is the positive contribution of Ayurveda to World-Medicine. Any research programme must take special note of this fact and make "Rasayana" procedures, methods and recipes the subject of special investigation. Besides disease-remedies and manipulations, Ayurveda offers here, a great and

positive field of profound significance to the future medicine of the world.

One World-Medicine.—In the course of a few years, a few decades at best, there will be no longer many medicines, such as Indian medicine, Chinese medicine, European medicine, and so on. But there will be but one universally acknowledged science and art of medicine which will be the outcome of the comprehensive synthesis of all that is truly scientific, verifiable by experiment and experience and which belongs to all humanity and not merely to any particular section of it. We should strive to contribute our best to such a world-medicine and perhaps supply the very foundation to such a science. Ayurveda has a frame-work and basis of biological concepts of health and disease-processes which are much in need today, as distinguished from the analytical, and trial-and-error methods of experimental science. This basic structure of the biological concept of man's personality in Ayurveda may provide a helpful and guiding light to the experimental and analytical methods of modern science and make its advance more systematic and its pace, more certain and steady.

Time opportune.—The time for such a fusion or synthesis is very ripe now. Advanced medical thinkers of the west have recognised the need for an anchorage to the drifting ship of medical science, and have just realised the importance of the constitutional classification of the patient. Ayurveda has much mature wisdom and guidance to give them in the science of human constitution. If the scholars engaged in 'research' devote their serious attention to this aspect, their efforts are bound to be crowned with success and their results would lead medical science along a surer and a safer path to its ultimate goal. I therefore, exhort researchers to accord top priority to this branch of 'constitution research' which of course will be the major part of the 'clinical research' section. This is made much easier for us now by the empirical data. Modern medicine in fact, is entering upon a new phase in its history, a phase in which it is very akin to the basic concepts of Ayurveda. The very ethics of the profession are getting revolutionised. The patient-doctor relations are being changed from their footing of money or mercy, and are being based on state-framed rules for the profession. The new tendencies in politics and sociology are bound to carry with them the destiny of the profession, ushering in the era of "Socialised medicine".

Further, clinical experience and modern biological researches indicate the re-orientation of modern medicine along neo-Hippocratic lines. This is in fact, a return to what may be called 'Charakism,' a return to the classical modes of medical thought. Medicine to-day returns to a dynamic, synthetic and unitarian direction

after a period of wandering in a wilderness of morphological, analytical and localistic data. It is now returning to the classical integrative constitution-concept of the ancient sages, Hippocrates of Greece and Charaka of India. i.e., concentrating on integrated pathology based on the morphological, functional, chemical, economic and social factors gathered both from the laboratory and bedside observation. The body-constitution of man has regained its due significance. From a mere bacterial theory, the science has passed on to a realisation of the value of 'soil as well as seed' in normal as well as pathological states. A new concept known as constitutional physiology and pathology has gained ground and has made the work of Ayurveda easier, for the edifice of Ayurveda is based on this constitutional theory known as 'prakriti' (प्रकृति) to which Ayurveda will contribute a great deal more in the future.

Holistic outlook.—The recent evolution of microbiology, the progress of knowledge of nutrition and metabolism, the concept of integrative functioning of the endocrine glands and the vegetative nervous system and the studies on allergy and immunity have all revived the clinical interest in the study of constitutional or integrated or synthetic concept of the personality of man as a whole. Thus, this is an era of revival of the human constitution-concept all over the world and Ayurveda may therefore, play an important part in this era. The concept of the totality of man-cum-environment is gaining ground in modern science.

The authors of Ayurveda, 'the science of life,' intended to provide much more than mere skill in the treatment or diagnosis of disease conditions. It meant for them the total concept of life which includes both man and his environment. The well-being of man, the aggregate of body, mind and soul, cannot be confined to mere physical health, but extends to that total sense of enjoyment of physical, mental and spiritual satisfaction and enrichment born of a wholesome and mutually beneficial interaction between the individual and his environment, social, physical and spiritual. Man as a biological entity needs to adjust himself to his physical environment and as a social and spiritual entity to his environment in the society in which he lives and to the spiritual ideals thereof. Such well-being alone is real and is true of the man in his entirety and such is the object of the "science of life." Charaka declares therefore:

हिताहितं सुखं दुःखमायुस्तस्य हिताहितम् ।

मानं च तच्च यत्तुक्तमायुर्बेदः स उच्यते ॥

"That is named the science of life, wherein are laid down the good and the bad of life, the happy and the unhappy life and what is wholesome and what is unwholesome in relation to life, as also the measure of life." (*Char. Sutra I, 41*).

The triumph of truth.—Finally I would like to stress the fact that those who believe in truth and its ultimate triumph. (सत्यमेव जयते नानृतम्) have nothing to fear in this world. Max Muller has aptly remarked that Aryans were the most gifted race. To them reverence for truth was greater and stronger than anything else. Wherever truth lies, there will be success and happiness and wisdom. If there is truth in Ayurveda it is bound to succeed and whatever aspect or part of it is not a genuine component of the ancient wisdom of the great seers (the Rishis) but has been thrust into it by pseudo-sages and quacks will melt away like the dross in the gold at the touch of the acid. But the living truth of this sacred science of life—'Ayurveda' is a growing truth like the holy Ganges which gathers volume, as it flows towards the sea. In the words of the famous English Physician Osler, "Truth grows like a living organism. It can never spring Minerva-like to full stature at once. Truth may suffer all the hazards incident to generation and gestation. There may be failures and frailties during its acceptance."

Truthful concepts remain dormant for centuries awaiting the fulness of time. All scientific truth is conditioned by the state of knowledge at the time of its announcement. Workers discovering new truths may have to pay dearly for their boldness. But the new spirit is essential as it establishes the intellectual and moral freedom by which the fetters of dogma, authority and scholasticism are for ever loosened from the minds of men.

The need for coordinated effort.—In conclusion, I appeal to you who are present here and to those others who are not here, but who are working to discover the great potential values in Ayurveda, to work in mutual cooperation. Research will bear fruit only when there is coordination between the various individuals and institutions engaged in it. Much waste in reduplication and repetition of work may thereby avoided. The Government of India have resolved to establish a Central Research Institute for Ayurveda in Jamnagar and I earnestly hope that research-minded scholars and institutions in our great country will pool their resources and identify themselves with the centre in Jamnagar and offer their fullest cooperation to the institute in the successful attainment of its high ideals and objectives.

Conclusion.—I wish this conference the fullest measure of success. Research in Ayurveda is a vast subject, and I know that I have not covered every aspect of it. But if I have supplied some new basic ideas, corrected some misapprehensions, clarified a few confusing aspects of research and generally stimulated thought along progressive lines, I shall consider my labours to have been more than compensated.

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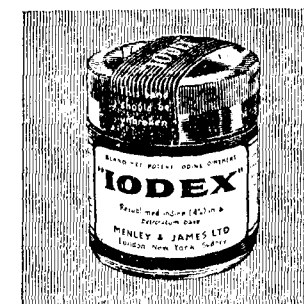
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Cases and Comments

CONGENITAL DIAPHRAGMATIC HERNIA

(With a Case Report)

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COMPLETE separation of the pleural cavities from the abdomen by a diaphragm is a mammalian character. It increases greatly the power of inspiration and restricts the thorax, the negative pressure of respiration. The diaphragm arises from four sources which appear at different times during embryonic life:—(1) the ventral portion from the septum transversum; (2) its lateral parts from the pleuro-peritoneal membranes; (3) derivatives from the body wall; and (4) the median dorsal portion is constituted by the dorsal mesentery. The first part to appear is a single anterior portion (*viz.*) the septum transversum, the superior surface of which becomes the floor of the pericardial cavity. Posterior to the septum transversum, the pleural canals form a communication between the thoracic and abdominal cavities. Gradually these canals are obliterated by the outgrowth from the pleuro-peritoneal folds. When the posterior borders of the dorsal margin of the septum transversum and pleuro-peritoneal folds meet and fuse with each other and with a small persisting part of the primary mesentery, the diaphragm is complete. This takes place at about the 8th week.

One of the common malformations found in new born infants is a failure of the pleuro-peritoneal folds to effect a complete separation of the abdominal and thoracic cavities. It is usually unilateral and the left side is more frequently involved than the right. The fold on the affected side may be completely absent or may be defective in the posterior portion. If the defect is on the left side it may carry with it the stomach, spleen, and part of the left lobe of the liver. If the defect is on the right side, it may carry only part of the intestine and the right lobe of the liver, as in the case described in this article. The extent of migration of the viscera depends on the size of the defect.

The defect on the right side is smaller. Rarely the defect may be present in both leaves of the diaphragm. If the defect is unilateral the thoracic contents are usually compressed and the thoracic organs are insignificant as in the case described below. In Potter's series of 70 cases, only one infant lived for 6 hours, while in the majority of cases, extra-uterine respiration was never established. In two cases described by Ratnavathi and Reddy (1952), one was still-born and the other child lived for 15 minutes. The usual picture is of a mature well-developed infant who appears normal at birth and makes a few gasping attempts at breathing, but dies in a short while despite all attempts at resuscitation.

The incidence of diaphragmatic defect is given variously by different authors. Vannesson in 1912 reported 34 cases of congenital diaphragmatic hernia in the new-born. Landesman (1951) observed a case of diaphragmatic hernia in his series of 19 congenital anomalies. Potter observed it in 70 infants out of 1700 cases. Ratnavathi and Reddy reported two cases of congenital diaphragmatic hernia in 14 malformed fetuses from Vishakapatnam.

The cause of diaphragmatic hernia is not known. Probably it might be due to dietetic deficiency with the superimposition of environmental factors on an appropriate genetic constitution.

CASE REPORT.—L., fifth para, aged 26 years was admitted in the hospital on 25-8-'53 at 9-45 p.m. for 10 months' amenorrhoea and in labour pains since 4 p.m. Previous four children delivered naturally at full term. No complications of pregnancy. At 11-25 p.m. a live male child was delivered. At 12-35 a.m. the child became suddenly cyanosed and breathless. In spite of intravenous coramine, oxygen and intra-cardiac adrenaline, the child could not be revived and it expired at 1-50 a.m.

Main autopsy findings.—Fetus weighed 5 lbs. 8 ozs. It was intensely cyanosed. No other congenital abnormalities were seen. Abdomen contained 2½ oz. of straw-coloured fluid. Left lobe of the liver was seen occupying most of the abdominal cavity and spleen was found just beneath the liver on the left side in its usual place. The right lobe of the liver with portions of the small intestines were seen in the thoracic cavity pushing up the right lung and completely collapsing the organ. (Fig. 1). These organs had gained entrance into the right thoracic cavity by means of the defect on the right side of the diaphragm. Other organs were normal.

Acknowledgements.—I am grateful to Dr. M. K. Krishna Menon, M.D. for permitting me to report this case, and thankful to the Artists Kumaradevan and Dhauraj for their technical help.

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"If any one deserves special representation in our legislatures, it is the leprosy patient, for he has no voice of his own nor is there any one to voice his sorrows and his rights"—Gandhiji. (1947).—(Leprosy in India. Apr. 1953).

Congenital Diaphragmatic Hernia

D. Bhaskara Reddy



FIG. 1.

Photograph of the fetus showing the right lobe of the liver and part of small intestines in the right thoracic cavity. Right lung is pushed to one side completely with resultant collapse.

History:—While he was on a slope while going uphill on a cycle, at 4 p.m., a bullock cart came from the opposite direction and collided with him. The projecting shaft of the bullock cart struck his abdomen. He felt extreme pain in the abdomen and came to hospital at 9 p.m. Injury to the abdominal organs was diagnosed and he was prepared for an abdominal operation under ether anaesthesia; a left paramedian mid-umbilical area laparotomy was performed. On opening the peritoneum a bruised coil of ileum presented with some faecal matter in it. On further search, a tear the size of a rupee was found in the mesenteric border. This was repaired, penicillin was dusted on the stitched area and the abdomen closed as usual. He made an uneventful recovery. The main point was that he was operated on within 8 hours of the accident.

A New Atoxic Antibiotic in the Treatment of Leprosy

Tzanok *et al* carried out experiments for the last 4 years, with a new synthetic atoxic product which does not have a cumulative action and the efficacy of which is not reduced on prolonged administration. Fifteen patients with leprosy were treated with J. 51, a mono-and-di-substituted sulphone. It was administered orally in tablet form, each tablet containing, 5 cg. of the drug. It was possible to continue treatment with it for 2 or 3 years after clinical cure, thus avoiding relapses. The average daily dose varied from 5 to 20 cg. per day depending on the age and response of the patient. The experiment made with this diamino-sulphone containing silver, showed that it was atoxic and as it had no action on the hæmatopoietic centres, it could be continued for years. Its therapeutic action in leprosy was rapid on most of the lesions. Sclerous nodules in which penetration was difficult began to retrogress at the end of two years, continuation of the treatment led to progressive and to total retrogression of the lesions. The bacteria did not become resistant. Treatment can be continued as long as necessary.—(*La Presse. Med.*, 61: 249, 25-2-1953, *Intern. Med. Dig.*, June 1953).

Prantal Methylsulphate in the Treatment of Peptic Ulcer

D'Imperio treated 25 cases of gastrointestinal diseases, (twenty of which were cases of peptic ulcer) using prantal methylsulphate, a new cholinergic blocking agent. Relief of symptoms was effected in 24 (96%) of the cases. In the one case where the drug was not efficacious, a fair trial was not provided because of the unusual nature of the patient's previous surgical experience and present symptomatology. Six cases previously treated with Banthine were changed to Prantal when the side-effects of dryness of the mouth, visual disturbances and constipation, as well as failure to relieve the symptomatology further, were observed with Banthine. In one case Banthine relieved the symptoms but excessive dryness of the mouth prompted its discontinuance. The dosage employed, varied from 1 c.c. (one % solution) every six hours by injection to 200 mg. orally every six hours; no side effects were observed. After the disturbing symptoms were controlled, the patients were maintained on a dosage of Prantal varying from 2 c.c. by injection to 200 mg. orally every six hours. The author considers that a valuable new drug has been added to the armamentarium of the physician for the treatment of peptic ulcer and related complaints.—(*Jour. Med. Soc. N.J.*, 50: 6, 265-274, June 1953).

POST-PARTUM OCCLUSION OF THE VAGINA

S. K. GHOSE, L.M.F.,
A.M.O., Gariabandh, Raipur, M.P.

A PRIMIPARA aged 18, came to the hospital escorted by her mother with a history of pain in her lower abdomen of 2 months' duration.

History of present illness.—She was married three years ago and was living since then with her husband. Ten months ago she gave birth to a healthy child at full term. Her old mother who attended during the delivery said that it was a very difficult one and the girl had a severe perineal tear which was not repaired. There was no difficulty in the expulsion of the placenta and there was no post-partum hæmorrhage; slight bleeding however, persisted for about 15 days, and was painful throughout. The girl narrated that the perineal tear gradually healed up automatically, but her vaginal orifice was getting gradually narrower and ultimately it was completely occluded within a month after delivery. She had no trouble with her micturition or defæcation which continued to be quite normal.

She did not disclose the vaginal closure to any body; but when her husband came to know about it, she was discarded by him. It was only during the last one and half months, she started feeling discomfort and heaviness in her lower abdomen with slight occasional pain; and during the last fortnight the trouble became severe and the pain which was slight and localised on the lower abdomen previously had become spread practically over the whole abdomen, and was so severe that she could not attend to any of her household duties.

PHYSICAL FINDINGS.—The girl was quite robust and healthy. No septic focus was detectable anywhere; she had no temperature; pulse and respiration were normal. Her gait was normal, pelvimetry excluded contracted pelvis. No history of V.D. or hæmaturia; menstruation normal ever since puberty, 4 years ago. Urine showed no sugar or albumen. It was acid in reaction with a sp. gr. of 1010. No other abnormality could be detected.

Family history:—Father died of some fever at the age of 50; mother is alive and in good health. She has a sister and two brothers—all in good health.

Local examination:—The supra-pubic region was swollen and tender. No fluctuation was noticed and the entire abdominal wall was also however, somewhat tender but rigid.

Vagina:—Both the labia majora were quite normal but the labia minora on both sides showed some atrophy and a brownish white fibrous band of tissue was found blocking the vaginal orifice.

and extended from near the external meatus of the urethral orifice, right down to the upper margin of the anus.

The clitoris and urethral orifice were both normal. Digital examination revealed that there was not even a pinpoint opening anywhere in the vaginal area. The fibrous tissue near the perineum was hard, while that over the vagina was soft and on pressing it, some resistance was felt from within.

Rectum:—No abnormality was detected in the rectal examination, except a little pain on pressing the posterior wall of the vagina.

Treatment:—As the dispensary was being run under the 'cheap-plan-scheme' there were no facilities for surgical operations. So I had to utilise the available slender resources and with the aid of 'Intraval Sodium' and a few other drugs I had, I proceeded to operate on the patient. Early on the morning of the operation, she was given a soap-water enema and a glass of glucose water with lemon juice to drink. Half an hour later, $\frac{1}{200}$ gr. of Scopolamine hydrobrom, mixed with $\frac{1}{4}$ gr. + $\frac{1}{100}$ gr. morphine and atropine respectively was injected intramuscularly. 1 c.c. coramine was also injected intramuscularly to fortify the respiratory system and the heart against intraval sodium. When the patient felt dryness of the mouth intraval sodium 1.0 gm. diluted with 20 c.c. double distilled water was injected intravenously, at a very slow rate.

It was my intention to ascertain first the extent of occlusion and so after cleaning the area well, I inserted a No. 1 hypodermic needle fitted to a 2 c.c. syringe into the soft fibrous tissue over the vagina. When it had pierced through about a third of an inch, I felt a release and dark blood rushed into the syringe. The dark brown colour and foetid smell of this blood revealed the fact that it was pent-up in the vaginal cavity for a fairly long time. I promptly made a deep incision $\frac{3}{4}$ " long into this fibrous tissue resulting in a gush of dark brown viscid blood. The opening was dilated with artery forceps, allowing the free drainage of the pent-up blood. It took 8 minutes for all the blood (about 6 ounces) to come out. As the effect of the intraval sodium was by now waning, I stopped further operation and had the wound dressed with planoform ointment 3i and thiazamide with acriflavin pulv 3 i.

By the morning of the next day there was almost complete relief of pain and subsidence of the swelling over the suprapubic region. I resumed the operation using the same anaesthetic technique of the previous day, removed all superfluous tissue in and around the vaginal introitus, so as to leave a circular opening that would admit of the ring finger. There was no bleeding. A warm Dettol douche was given and the vagina was plugged with sterile gauze and vaseline. The operated area was painted over with the ointment and dusted with thiazamide powder. Penicillin was given, one lac units every 3 hours. P.V. examination on the next day

revealed a slightly enlarged and retroverted uterus, but the cervix, fornices and vaginal wall were quite normal and healthy.

The patient was allowed to be ambulant from the 4th day douching and dressing were stopped; only the dressing of the vulva outlet was continued. The patient was discharged on the 10th day. P.V. examination before discharge showed that the uterus was normal but the vulval outlet was still somewhat fibrosed. The patient was advised to apply vaseline to that part for sometime and to call at the dispensary again after a month for re-examination; she did not however, turn up as directed.

Discussion.—The interesting points about this case are:—

(1) The retention within the vaginal canal of blood, presumably postpartum or/and normal menstrual fluid, as a result of the rapid growth of;

(2) a band of tissue over the introitus, so as effectively to prevent the escape of the discharges.

(3) That this was really an effective tissue barrier and not the approximated and inflamed adjacent soft tissues that blocked

(Continued on page 750)

Mysoline in the Treatment of Epilepsy

Butter of St. David's Hospital, Edmonton, England, used Mysoline for 15 months in treating 58 sane male adult epileptics whose fits were not satisfactorily controlled by phenobarbitone, soluble phenytoin, mesantoin, phenyl-methyl-malonylurea, bromides, belladonna, amphetamine sulphate, or combinations of these. The transition to treatment with Mysoline was effected gradually. The dosage of Mysoline varied from 1 to 2 g. a day, in divided doses.

Most of the patients complained of slight drowsiness or listlessness during the first few days especially before breakfast. One man complained of nausea, 2 became slightly ataxic and one had slurred speech. Eight patients continued to feel drowsy, and the treatment was eventually discontinued in these cases. No other toxic symptoms were observed. Urine and blood showed no abnormalities. Treatment was discontinued in half of the patients because of failure to reduce the number of fits, or because of complaints of drowsiness. Of the remaining 50 per cent, 3 per cent showed 100 per cent improvement; 10 per cent showed 75 per cent improvement; 15 per cent showed 50 per cent improvement; 7 per cent showed 25 per cent improvement and 15 per cent showed no improvement in incidence of fits, but said that they felt better. Since the toxic dose of soluble phenytoin is close to the therapeutic dose, this preference for a drug of low toxicity is not likely to be merely fanciful. Of the 29 patients still being treated with Mysoline, 20 are taking Mysoline only; 2 are having Mysoline plus malidone (because of petit mal) and the remaining 7 are having Mysoline plus soluble phenytoin.

Since the patients chosen for treatment with Mysoline were those most refractory to treatment with other drugs, the author concludes that the improvement of 20 of them through Mysoline alone was most gratifying; less severe cases of epilepsy might well respond much more satisfactorily.—(*Lancet*, 23.5.1953, *Abst. Dig. Neur. Psych.*, July '53).

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

Vol. 50

OCTOBER, 1953

No. 10

THE NURSING PROFESSION AND PUBLIC HEALTH

ADDRESSING the Third Annual Conference of the Trained Nurses' Association of India, Madras State Branch at the New Nurses' Quarters opposite the General Hospital, Madras on the 19th ultimo, Sri Dr. A. LAKSHMANASWAMI MUDALIAR, Vice-Chancellor of the Madras University said that "if the nursing profession of India was to attract the right type of people and to create in the popular mind that high reverence that ought to be given to the profession, it could only be, if the nurses were in a position to enforce right standards of ethics in all that belonged to the profession. They should show not merely by rules and regulations but by actual example that they could guide their younger sisters on proper lines and always keep to the noble traditions of their profession, those high and noble ideals of service to humanity, of sympathy and understanding and of equivalent benevolence to rich and poor alike, of all sections and of all ages."

A great deal was said about the dearth of trained nurses as indeed people spoke about the dearth of trained and qualified doctors. "The real fact of the matter was", said Dr. MUDALIAR, "that even those who had been properly trained were not given opportunities for suitable employment by the State, by philanthropic organisations and by other local bodies". It is indeed a fact that in many hospitals, particularly in remote and rural areas, the nursing staff is totally inadequate to meet the demands of the institutions; in several places qualified and trained sick nurses are not available at all. As we pointed out in a recent issue of the ANTISEPTIC, all the State hospitals are under-staffed; even the Premier Hospital in the State, The Madras General Hospital, has not

the vagina, is manifest from the fact that only on piercing through the barrier did the underlying pent-up congested blood gush out.

(4) The neglected perineal tear, may have set up a fibrosis which rapidly spread and effectively blocked the introitus within a month after delivery.

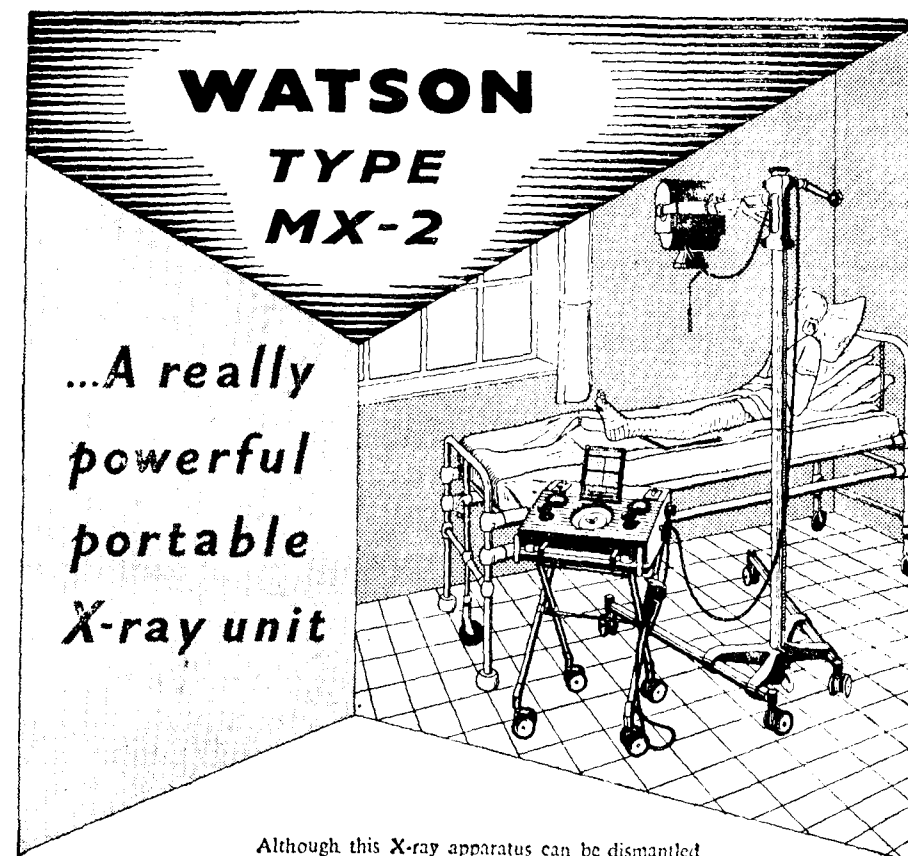
(5) There may have been severe injury to the vaginal walls also at the time of delivery and the lacerated wounds left uncared for, developed fibrosis and caused the approximation of the orifice in the act of healing, to the extent of bringing about the effective blocking within a month!

(6) The fact that, though she gave birth to a baby ten months previously, she developed severe pain and symptoms of abdominal tension, only two months prior to admission in the hospital indicates, that she probably started menstruating again 8 months after confinement, by which time the vaginal blockage had already become complete and effective.

Besides these points of scientific and medical interest, there are also two tragic psychological facts which force themselves on us:— viz., (1) this robust and healthy young girl of 18, was discarded by the husband for no fault of hers and without giving her a chance to get treated and made fit again to play her role as a dutiful wife and helpful partner, and (2) through ignorance, many cases of neglected accidents occurring during delivery, are kept secret only to result in avoidable misery, such as is brought out by this case report.

Treatment of Snake Venom Poisoning with Cortisone and Corticotropin

Hoback and Green of the Clinical Valley Clinic Hospital of Richlands, Va., treated three patients bitten by poisonous snakes during the last five months, with cortisone or corticotropin; all received in addition standard treatment consisting of the application of a tourniquet and incision and suction of fang wounds, antivenom, tetanus antitoxin, antibiotics and other symptomatic and supportive therapy. The authors were impressed by the pronounced success of the treatment in all the 3 cases as compared with 11 others seen in the past 3 years who did not receive cortisone or corticotropin. The three cases were of young children between 4 and 5 years of age and were treated, two with cortisone 25 mg. orally every six hours, and one with corticotropin 25 mg. intramuscularly, besides the other treatments. Metts reported in 1951 the case of a woman bitten by the venomous copper moccasin, who was given corticotropin, with remarkable improvement, including relief of pain, and disappearance of other toxic signs and symptoms especially the altered cellular reaction, which was also observed by Hoback and Green. The effectiveness of cortisone in young patients (in whom generally a poor prognosis is to be expected) was probably due to its remarkable ability inhibit local tissue reactivity to foreign protein (here the snake venom) and to its symptomatic effects on pain and fever.—(*Jour. Am. Med. Assoc.*, 152:3, 16th May 1953).



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got an adequate number of nurses and the Government report agrees that there is overcrowding but no proportionate increase in the staff to meet the great increase in the number of patients over the sanctioned strength. We are told in the same breath that there are no vacancies for trained hands! Actually the enormous overcrowding in all hospitals would warrant the absorption into the service, of all trained nurses who are without jobs and many more. Miss JACOB, President of the Conference said that "There is a trend for trained people to leave the profession. A loss to the profession through marriage was inevitable but many fully trained nurses were eager to accept jobs in other fields." This is an indeed alarming sign. It should be the aim of the cooperative efforts of the State Government, Institutions, and private bodies to check this disturbing tendency on a country-wide basis. At the same time, it should not be forgotten that this tendency would not spread and would automatically cease if the profession is made as attractive as its importance demands, and if its members were given a better status than the subordinate and sometimes even despised position now accorded to them (their training warrants and justifies a much better and higher status) and when the cheerful and willing services the nurses give to the sick and wounded are properly appreciated and respected by the society and by the medical profession.

Miss JACOB referred to the unemployment of trained nurses in the Madras State and to the shortage of nurses in some of the other States in India. The hesitation among some of the trained nurses to go to distant places in the country is not a healthy sign. The basic principle of a Nurse's training is the relief of suffering and ministering to the needs of the sick in any part of the world. Who does not know of the lady of the lamp, Florence Nightingale who journeyed all the way from England to the Crimean front to relieve the distress and agony of the wounded and offer solace to them in their hour of trial and suffering?

In 1951 it was computed that there were only 16,550 trained nurses in India. Unless there is a complete reorientation of the policy of the Central and State Governments and of the numerous charitable private and public institutions in the matter of the training, employment and prospects of nurses, we cannot hope to reach anywhere near the target aimed at by the Bhore Committee of having 7,40,000 nurses by 1971 to meet the country's needs!

INDUSTRIAL MEDICINE AND HYGIENE IN INDIA

Integration and willing cooperation are necessary for success

"THE importance of environmental hygiene could not be over-emphasised and the question of industrial health must be the responsibility of the State with its large medical and public health personnel and experience in dealing with such problems in connection

with the general health of the people" said Sri Dr. U. KRISHNA RAU, Minister for Industries and Labour of the Madras State, when he presided over the Second Annual Conference of the Society for the Study of Industrial Medicine, Madras State Branch, held on the 12th September 1953 at Madras. Dr. M. N. GUPTA, Deputy Chief Adviser of Factories (Medical) of the Union Government who read a paper on "Industrial Medicine and Hygiene in India" said that intensive effort to improve the health of one group of the people could never be successful unless they made comparable efforts to improve the health of all. The subject of industrial hygiene and occupational diseases was one of the most important branches of preventive medicine. The idea that Government had a responsibility towards the governed must precede all real advances in labour legislation without which no progress in combating industrial diseases would be possible. These changes in the political concepts started during the eighteenth and nineteenth centuries.

In England, a succession of Factory Acts in the nineteenth century introduced various measures for protecting the worker in industry against disease and injury and for limiting the hours of work of women and young children. In 1833, factory inspectors were appointed to enforce the law and in 1844 provision was made for the examination of young entrants into industry by 'Certifying Surgeons' and in 1943 there were in Great Britain 2000 such surgeons, employed of course, on a part-time basis. The First Medical Inspector of Factories was appointed in England in 1898. These Inspectors and their lay staff have been doing valuable work in the general supervision of health in industry, in seeing that the statutory requirements are properly carried out. In 1940, the Minister of Labour in England introduced an Order making it possible to compel factories to employ a doctor to supervise the health of workers in certain special circumstances. The growth of the Industrial Medical Service is of the highest significance and there is in the United Kingdom today greater concentration of effort than ever before, in the prevention of disease and on the promotion of the health of the industrial worker, linked up with schemes of rehabilitation.

It is therefore, of utmost importance that in our country the problem of industrial hygiene should be integrated with all other public health activities. The industrial population of India according to employment figures of 1951 was:—29,50,000 workers in factories; 5,00,000 in mines, 12,00,000 in plantations, 16,00,000 in Railways, 2,00,000 in Post and Telegraph, a similar number in P.W. Dept.; 50,000 in seaports and 64,000 seamen. In other words, 2 crores out of the 36 crores of Indian people come under the category—'Industrial Population'. The need to protect the health of this sizable section of the community becomes imperative in order to ensure the country's economic stability and progress. "Occupational health is a joint "Industry-Public health responsibility" said

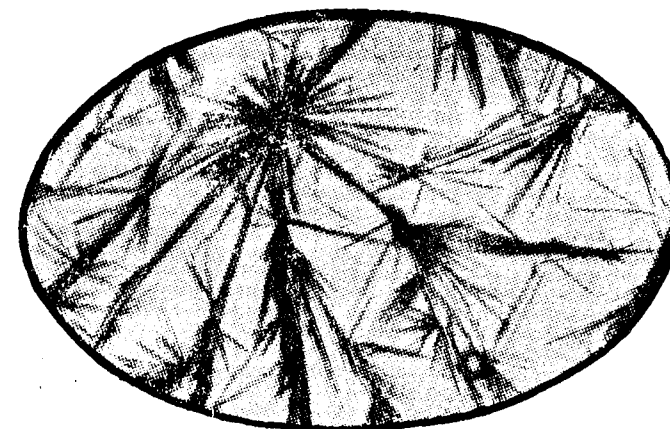
Dr. GUPTA "and Industry had come only a little less than half way to meet public health agencies in respect of this responsibility".

The Sixth International Conference of Social Work held earlier this year in the City of Madras, gave a top place to social insurance in the Social Security Scheme. The Union Government instituted a statutory provident fund for employees as a measure of relief and help. The Ordinance of 1951, later replaced by an Act in Feb. 1952 covered six major industries viz., Cement, Iron and Steel, Engineering, Cigarettes, Paper and Textiles. Factories of 3 years' standing come under this scheme. The Central Government has since decided to transfer the administration of the Employees' Provident Fund Act of 1952 to the States Governments. The Employees' State Insurance Act was placed on the Statute Book in 1948 and the Employees' State Insurance Corporation was inaugurated in October 1948.

This scheme which was first introduced in Delhi and Kanpur was sought to be extended to the Madras State and Coimbatore which is one of the largest industrial centres was chosen, Sri Dr. U. KRISHNA RAU, our Industries and Labour Minister felt sanguine of being able to introduce it and get it going in Coimbatore, by the beginning of the present official year 1953-'54. He does not, however, appear to have succeeded yet, as evidenced by his statement on the 12th September '53 to the effect that "nothing could be done to improve the present state of affairs, unless there was a change of heart among the managements and unless they approached these questions with sympathy and human considerations." The worker, he had found during the term of 15 months as Labour Minister, was a perplexed being, who wanted to live and live comfortably. He was not denied this, but he had not had ample opportunities to get the things he needed for comfortable living. That explained his sense of frustration disappointment and dissatisfaction. Sri Dr. KRISHNA RAU agreed that there was urgent need for a Medical Officer to attend to the industrial hygiene of factories and said that the Madras Government was seriously considering the question. The present unsatisfactory and insanitary housing conditions also called for urgent remedial measures.

Industrial medicine and the safeguarding the health of the workers who number 2 crores amongst the people of the land, involve the expenditure of money and the managements should take a broad and a long-range humanitarian view of things instead of becoming panicky and squeamish at the mention of financial aid to labour welfare.

The welfare of labour is their greatest asset and source of profit and if this aspect come to be constantly kept in mind at every stage, the industrial concerns of our country will cease to be shortsighted. A truly optimistic and liberal outlook will then pervade the industrial atmosphere of the country.



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MEDICINE AND THERAPEUTICS

Use of penicillin with blood in children —(*Abst. World Med*, 2, 1, 11 : 1952).

The frequency of dosage with penicillin may be greatly reduced by mixing it with blood, which shows the rate of absorption. The required dose of the dry penicillin powder is dissolved in 1 c.c. of normal saline, and mixed in a syringe with 1 c.c. of fresh or stored blood and injected intramuscularly. The injection is repeated after 12 hours. This method was used successfully in 130 children with various diseases. No infiltration or other complications due to the injection of blood were noted and the therapeutic effect was quite as good as that obtained in a control group of children treated with penicillin in saline, who had to receive three times as many injections.

as to whether one more than another predisposes to fungus infection; however, because the incidence of this disease increased after the introduction of the broad spectrum antibiotics, it is likely that one or more of them is responsible. The American Medical Association's Council on Pharmacy and Chemistry has recommended that a statement warning of the danger of moniliasis, be added to the labels of aureomycin, chloramphenicol, and oxytetracycline.

Treatment of delirium, psychosis and coma due to drugs.—(*Lancet*, 21.3.1953, pp. 570-573).

In view of the useful role played by glucose, Vit. C., aneurine, pyridoxine and nicotinic acid in brain metabolism, Dr. Jonathan Gould of the St. Bartholomew's Hospital, London, used these in heavy doses in treating coma, delirium and psychosis induced by drugs. His typical prescription was:—glucose 10 g. (10% solution) 100 c.c.; pyridoxine, 200 mg.; ascorbic acid, 1500 mg.; aneurine hydrochloride, 1000 mg.; nicotinamide, 200 mg. and distilled water or normal saline solution to make up 250 to 300 ccs. This solution is administered by direct, moderately rapid injection into a vein or rapid drip. After the initial dose which may be repeated if response is delayed or not satisfactory, he usually gives two more injections each containing one half of the above amounts at intervals of 4 or 8 hours. There is no need for analeptics usually but if absolutely necessary smaller amounts will suffice. Several different types of cases have been treated successfully by this technique e.g., (1) the effects of over doses of barbiturates, (2) collapse under continuous narcosis, (3) post-operative psychosis, (4) drug-induced delirium, and (5) acute alcoholic psychosis and delirium tremens. In all these cases the mental condition cleared up rapidly following the administration of the glucose-vitamin mixture.

Fatal fungal infections complicating antibiotic therapy.—(*J. Am. Med. Assoc.*, 152 : 3, 16th May 1953).

For many years *Candida albicans* has been known to cause local infection in the mouth, skin, nails, and vagina. Such lesions have rarely been fatal in the past. Recently, there has been a noticeable increase in the frequency with which fungi, particularly *C. albicans* have produced generalized and fatal infections. The importance of this change has not been universally accepted, although many clinical and laboratory reports have appeared warning of the increased virulence of *C. albicans* during antibiotic therapy. Brown and his coworkers of the Albany Medical College report 5 additional cases of fatal fungal infection, associated with antibiotic therapy. At autopsy of two cases, both had monilial abscesses in the myocardium, kidneys, and lungs. Blood cultures grew *C. albicans* in one and *C. tropicalis* in the other: In each of these cases as well as in most of those cases reported in the literature, more than one antibiotic was used. It is therefore, difficult to draw valid conclusions

Peripheral neuropathy due to isoniazid.—(*Lancet*, 30.5.1953, pp. 1073-74).

Preliminary reports on the chemotherapy of tuberculosis with isoniazid had mentioned certain toxic responses including hyper-reflexia, transient extensor plantar responses, hesitancy of micturition, vertigo, evanescent proteinuria and occasional severe eosinophilia. More recent reports have mentioned agranulocytosis and nervous complications including acute pellagra, confusional psychosis, hyperaesthesia, polyneuritis, motor weakness, schizophrenia and peripheral neuropathy. Jones and Jones of the Liverpool Aintree Hospital report on two more cases of peripheral neuropathy due to isoniazid.

The first patient, after six weeks of daily treatment with 18 g. PAS and 300 mg. isoniazid, complained of hyper-sensitivity of hands and feet with considerable sweating of palms and soles. Wrists and fingers gradually weakened in muscle power. Dyspnoea became more troublesome. PAS therapy was stopped but symptoms persisted. The isoniazid was also stopped and he was given 18 mg. thiamine orally every day. Four weeks after stopping chemotherapy he was admitted to hospital with signs of congestive heart failure, pronounced wasting of the muscles of the forearms, and of the small muscles of the hands, bilateral wrist-drop and other signs of peripheral neuropathy. Intramuscular thiamine and mersalyl had no effect. Classical pellagra-features developed and he was given nicotinamide 100 mg. and mersalyl intramuscularly; this resulted in rapid improvement.

The second patient had two courses of isoniazid therapy (450 mg. every day). Towards the end of the second course she complained of paraesthesia, "hot feelings" in the hands and feet. Stiffness and numbness of the legs with occasional shooting pains gradually increased. Appetite became poor, but improved when isoniazid was stopped. Two weeks after the discontinuance of the isoniazid therapy, signs of peripheral neuropathy were manifest in the form of absent ankle reflexes, pain

in muscles on pressure, and areas of anaesthesia over legs and feet. Her symptoms improved gradually and three weeks later, the signs of neuropathy were noticeably fewer.

From these and other cases recorded in the literature, the authors consider that neuropathy caused by isoniazid results from the competitive inhibition of nicotinic acid by the isoniazid. The symptoms are those of pellagra, and respond to nicotinamide. The cardiac failure in their first patient with a previously damaged heart, was manifestly also related to a deficiency of nicotinic acid. Deficiency of other members of the vitamin B₂ complex may also be involved in producing these complications of isoniazid therapy.—(*Dig. Neurol and Psychiat.*, July 1953).

A new and simple method to determine lesions of nerve cells.—(*Med. Times*, June 1953, p. 410).

A simple test to determine mild lesions of the motor nerve cells of the brain even after standard methods have failed was described by Wartenburg of San Francisco (J.A.M.A.). The technique of performing the test is based on the spontaneous dropping of the knee.

The relaxed patient lies supine on a hard examining table. His knees are flexed, so that the inner angles of the knees are slightly more than 45°. Friction between the patient's heels and the surface on which they rest is reduced to a minimum by placing a metal plate under the heels and spreading talcum powder on the plate and heels.

The examiner then just waits for any changes in the horizontal level of the knees. If a lesion is present, the knee will drop evenly and steadily until the leg comes to lie flat on the surface of the table. The lesser the lesion, the longer it takes for the knee to drop and the slower the pace of dropping. "The value of the knee-dropping test lies in the fact that it has proved useful in uncovering cases of hemiplegia at their earliest inception". The test has the following advantages:—

(1) it is easy to perform; (2) no inconvenience is caused to the patient;

(3) it does not need the patient's collaboration; (4) the results of the test are easy to interpret as they are plainly visible, unmistakable and unequivocal; (5) it helps to detect the slightest defects in the motor nerves of the brain or their fibres which connect with the spinal cord at a very early stage; and (6) in a mild lesion, the dropping occurs so slowly, evenly and regularly that it cannot be imitated.

Fixed eruption due to sulphonamide hypersensitivity.—(*Br. Jour. Ven. Dis.*, 29: 1, March 1953).

Cutaneous reactions following the use of the sulphonamide groups of drugs, are not of uncommon occurrence. Fixed eruptions due to them are however, rare. A fixed eruption may be defined as being "characterized by the rapid development of one or more sharply circumscribed lesions on the skin or mucous membranes, as an invariable response to the administration of the offending drug." Sulphonamides are still used on a limited scale in treating venereal diseases. Drs. Campbell and Doyle of the Department of Venereology Royal Hospital, Sheffield have furnished a very interesting report on two cases of sulphonamide hypersensitivity. Recently Ghosh (1952) reported a case of strictly localized sensitivity reaction of the nature of fixed drug-eruption in a young male student, in whom swelling of the lips, anus and external urethral meatus accompanied by the appearance of erythematous plaques over the left hypochondrium and medial border of the right foot, occurred on 3 occasions during 12 months after the exhibition every time of sulphonamide drugs for repeated attacks of acute bronchitis.

The first sensitivity reaction followed the administration of sulphathiazole, the second followed the ingestion of sulphadiazine, and the third followed the use of sulphatriad tablets. On each occasion all signs subsided within 4 days of withholding the offending drug, leaving only residual spots. Ghosh observed that the same reactions developed whatever sulphonamide was used. Percival (1951) found that "fixed drug eruptions" often left residual pigmentation. The lesions, according to him were usually ery-

thematous plaques of varying size and duration; occasionally they were urticarial or bullous.

In case No. 1 of the present study reported by Campbell and Doyle, a sharply circumscribed urticarial lesion occurred on the left ring finger after the exhibition of sulphonamide drugs and in their case No. 2 an acute erythematous eruption appeared on the penis after the ingestion of sulphatriad tablets. In both cases, the cutaneous lesions of an identical nature recurred in identical sites after the administration of sulphonamide drugs.

Electrical termination of hypoglycaemic coma.—(*Jour. Ment. Sci.*, London, 99, Jan. '53).

Montague selected 14 schizophrenics at random from those receiving insulin coma therapy. Cerebral electro-stimulation of subconvulsive intensity was applied during their hypoglycaemic coma; the current used was made up of brief, unidirectional, 'square waves'. The transcerebral stimulation produced a rapid but transient rise of the blood-sugar level which was correlated with the clinical response in time and intensity. This increase in blood-sugar concentration is mostly due to a direct action of the current on the brain centres since it was definitely lower when the central passage of the current was reduced by the unilateral application of the electrodes. The results obtained with this therapy are very similar to those which have been reported by other workers who administered injections of glutamic acid and of epinephrine during hypoglycaemic coma. The new therapy needs further study for confirmation of results.—(*J.A.M.A.*, 16.5.'53).

Benadryl and pyribenzamine intoxication in children.—(*Judge D. J. and Dumars, K. W., Am. Jour. Dis. Child.*, 85: 5, May 1953).

In view of their widespread use in the therapy of allergic and associated disease. Judge and Dumars review the hazards of acute intoxication due to Benadryl and Pyribenzamine. The consumption of these two antihistaminic

agents has become enormous and the associated hazards of indiscriminate use are the cause of great concern. Toxic doses frequently cause many troublesome side effects and severe reactions, which can cause death too. This is the great concern of all physicians now. These two antihistamines are rapidly and completely absorbed when administered orally and only traces have been found in the digestive tract four hours after administration. The drugs rapidly leave the blood stream and localize in the various tissues. Their therapeutic action may be due to their interfering with the action of histamine on the shock organs *i.e.*, mucous membrane, skin, conjunctivæ, smooth muscle etc. The liver appears to be the principal site of benadryl and pyribenzamine degradation.

Common side-reactions of the antihistaminic agents are well known to all physicians. The severe reactions and those which particularly affect the central nervous system have been reviewed in this article. Acute toxicity of these drugs will affect the gastrointestinal, cardiovascular, respiratory, genito-urinary and hæmatologic systems and also the skin and mucous membranes. The neuropsychiatric manifestations, however, are more frequent and important. The most severe reactions occur with higher doses. The patient's idiosyncrasy to either drug is also an important factor to reckon with. About one half of the 30 cases of severe intoxication reported have been in infants and children. Children are more susceptible to the stimulatory effect of these drugs, although depression can also occur. Allergic individuals exhibit toxic reactions more commonly.

There is a similarity between the atropine, and the antihistamine intoxicated child. The effects on the central nervous system involve both the cerebrum and cerebellum with initial stimulation followed terminally by great depression. Cortical stimulation is intense. Hallucinations, excitement, muscular tremors, athetoid movements will often precede convulsions, which are of the tonic-clonic type and exceedingly refractory to treatment. Dilated pupils flushed facies, hyperpyrexia accompany the ini-

tial stimulation. The critical period following the ingestion of excessive amounts of the drugs is from 2 to 8 hours, after which the signs and symptoms frequently resolve. In fatal cases convulsions are followed by coma and cardio-respiratory failure. Anoxic changes in the brain, liver, lungs and kidneys have been reported.

Treatment of intoxication due to these drugs:—The maximum recommended dosage of these 2 drugs for children is 2 mg. per pound of body-weight. In cases of excessive ingestion, an initial evacuation of the contents of the stomach should be attempted purely by the mechanical method. The use of any other method is attended with the risk of aspiration of the stomach contents. Barbiturates should be given cautiously when required, if evidence of central nervous system irritation is present; phenobarbital with its specific anticonvulsive effect is about the best to use. When convulsions occur, they can be controlled by large doses of sedatives—ether or paraldehyde. When depressant effects are substituted for the excitatory effects, benzedrine or caffeine can be given intravenously or intramuscularly, the dosage and route of administration depending on the age of the child and degree of intoxication. The patient should be under careful and constant watch all the time. Oxygen permits more comfort and easier breathing. Fluids, including dextrose solutions can be given, as indicated.

Benemid and Sodium PAS.—(*Tubercle*, London, 33: 138-142, 1952).

Simmonds and Hess of the Clare Hall Sanatorium, studied the blood PAS levels in 12 patients under treatment with the drug for active pulmonary tuberculosis. PAS gets conjugated in the blood stream with glycine and rendered inactive; benemid has been found to inhibit the enzyme system concerned with this conjugation. For one week 9 patients were given 3 g. and three patients 5 g. four times a day and the serum PAS level was then determined $\frac{1}{2}$, 2, 3 and 4 hours after a dose had been administered. Similar determinations were then made after 0.5 g. of benemid had

been added to each dose of PAS for 2 days and a third series after the benemid had been administered 30 minutes before each dose of PAS. The determinations were repeated after this last scheme of treatment had been followed for one and two months.

The results show that it is possible to raise the effective serum concentration of PAS significantly by giving benemid before each dose of PAS. The serum levels attained with a total daily dose of 12 g. of PAS and 2 g. of benemid were adequate and roughly equal to those attained with a dose of 20 g. of PAS given without benemid. Benemid therefore, offers some relief to patients in whom the larger doses of PAS have

toxic effects; benemid itself has insignificant toxic effects in the dosage used.

Anti-allergic action of local analgesics and antihistaminics on the tubercular reaction.—(*Acta. Allerg. Kbh.*, 5: 88-97; *Abst. World Med.*, 12: 5, 1952).

At the Institute of Pathology, University of Liege, Lecomte and Borens-tayn found in 30 patients, tuberculous and non-tuberculous that both analgesics and antihistaminics, when injected at the same time as tuberculin, inhibit the tuberculin skin reaction. It is suggested that these substances act by suppressing some component of the inflammatory reaction.

SURGERY

Hazards of lumbar puncture.—(*Symposium. Intern. Med. Dig.*, July 1953).

Lumbar puncture is an indispensable procedure for both diagnosis and therapy. There are however certain dangers associated with the procedure, which are being more frequently emphasized during recent years. Kennedy *et al* (*J.A.M.A.*, 3-11-1945 and *Surg. Gynaec. Obst.*, 91, Oct. 1950) first reported on the grave spinal cord paralyses caused by the spinal anaesthesia, which missed detection in some cases as they often appeared after the surgeon had discharged the patient. Dripps and Vandam (*J.A.M.A.*, 17-11-1951) listed the commoner complications as headache, diplopia, backache, paresthesias in the legs, paralysis or weakness of the muscle, usually of the legs, and infection either localized or diffuse in the form of meningitis.

DIAGNOSTIC:—The hazards of lumbar puncture fall into several definite categories: In the first of these are the numerous effects of direct trauma because of the lack of skill and the choice of an unsuitable needle; ligaments, vessels, nerve roots, spinal cord and even intervertebral disks have thus been damaged. In another group infections have followed septic technique; generalized meningitis or else an epider-

mal abscess has resulted. A third and larger group of hazards is the disturbance of the dynamics of the CSF; and the danger of herniation of the brain through the tentorium or the foramen magnum from puncture in the presence of increased intracranial pressure has often occurred. Such a contingency calls for rapid surgery in a most dangerous field. Among other dangers is that the withdrawal of as little as 10 c.c. of fluid may result in different vascular dilatation to induce intracerebral or meningeal hæmorrhages from diseased structures like aneurysms or sclerotic vessels.

Ocular palsy is another possible sequel to lumbar puncture. Pressures of CSF and in the auditory labyrinth are closely related and the impairment of hearing that occasionally follows lumbar puncture may be due to a lowering of the CSF pressure.

The post-lumbar puncture headache belongs to the category of the dynamic disturbances. This headache is aggravated or precipitated by the assumption of an erect posture and may be relieved by abdominal pressure or compression. It may come on, as long as 7 days after puncture and may last for weeks, if untreated. Wolff *et al* in their monograph on "Headache and other pain" believe that this headache results from

the loss of CSF and subsequent traction displacement or swelling of those contents most susceptible to pain—the venous sinuses, the dura and its arteries and also the basal arteries. Sciarra and Carter (J.A.M.A., 8-3-1952) showed that headache was almost as common after simple puncture of the theca without withdrawal of CSF, as after withdrawal of 10 to 15 cc. of CSF. Page (*Lancet*, 3-1-1953) found that in addition to headaches there may be vertigo, vomiting and other symptoms of intracranial hypotension, including disturbed consciousness.

THERAPEUTIC:—In cases where anaesthetic, diagnostic or therapeutic compounds are introduced into the theca, a fresh chain of events is set up and new hazards are encountered; they constitute another group. Sphincter disturbance and even paralysis of the limbs are known to have followed spinal anaesthesia. Both headache and backache are produced by myelography when radiopaque material is introduced into the theca by the lumbar or cisternal route. There is an increase in the cells and protein content of the CSF.

Pneumoencephalography has complications of its own. The first ccs. of gas to reach the brain cause an immediate crushing headache which builds up as the volume of gas in the arachnoid space increases and maximum replacement of the CSF with gas results in the most severe and the long-continued headache.

Suggestions for minimizing the hazards of lumbar puncture as a therapeutic measure are given:

(1) The drugs should be tested and proved harmless.

(2) Spinal anaesthesia should be used only when general anaesthesia is absolutely contraindicated.

(3) Pneumoencephalography can be performed humanely and efficiently with the introduction of 30 to 40 cc. of air, if it is combined with painstaking positioning of the patient, so as to display all of the ventricular system for visualization.

(4) Those who attempt even ordinary spinal puncture should have acquired

the skill to accomplish it. It is deplorable that this is too often not so.

(5) Those who attempt to introduce air or drug should be even more qualified.

(6) The occurrence of headaches in 40% of ambulant patients in Sciarra's series emphasises the desirability of 24 hours' rest in bed after lumbar puncture and the need for increasing the fluid intake after the puncture.

(7) Post-lumbar puncture headache is treated with deoxycortone by mouth or by raising the CSF pressure by a second puncture and introduction of saline intrathecally. But most patients object to a second puncture.

(8) The use of saddle-block in obstetrics has been known to produce in some complete and permanent paralysis and though not common it is a 100% disaster both to the woman and to the obstetrician.

Affections of the facial nerve.—(Lathrop, F.D., *J. A. M. A.*, 152:1, 2-5-1953).

Lathrop deals in this article with certain affections of the facial nerve, which may be very distressing e.g., herpes zoster, geniculate neuralgia, central and cerebral facial palsy, congenital facial paralysis, Bell's palsy, and Melkersson's syndrome.

The seventh cranial nerve is a mixed one and therefore, the symptomatology of a disorder affecting it will depend on whether the smaller sensory component or the larger motor division or both is involved in the pathological process. Thus, affections of the sensory portion are manifested by pain in the ear: while paresis, paralysis or hyperkinesia of the muscles of expression of the face is observed when the motor component alone is affected. Not infrequently an affection of the facial nerve involves both of the components, and, when this is the case, pain in or about the ear and paralysis of the face occur.

The facial nerve is subject to disease just as is any organ of the body. Paralysis of the face, whether secondary to Bell's palsy or to injury of the nerve is the most commonly encountered

affection of the facial nerve and its effect on the economic and psychological adjustment of the patient may be profound.

Treatment:—Symptomatic and supportive treatment is all that can be offered in cases of zosteriform inflammations referable to the geniculate ganglion, while the disease runs its course. In all cases of typical or atypical facial neuralgia, Lathrop administers a mild sedative, thiamin hydrochloride 10 mg. nicotinic acid 50 mg. and ferrous carbonate 1 gm. thrice a day; this is only a palliative treatment. Complete and permanent relief may be obtained through intracranial section of the nervus intermedius. There is no specific treatment for congenital facial paralysis. The prognosis for spontaneous recovery in cases due to obstetric causes depend on the manner in which the injury to the nerve had occurred i.e., pressure due to application of the forceps and impingement on a bony prominence of the birth canal during labour, or the head being pressed against the shoulder during the later months of pregnancy. In cases of Bell's palsy it has been computed that 75 to 85 per cent of the patients recover spontaneously. The treatment at the present day varies from doing nothing at all to surgical intervention in every case exhibiting a negative faradic test. Opinions vary as to when surgical intervention, in the shape of decompressing the facial nerve, should be undertaken. It should be instituted cautiously, before degeneration has occurred and therefore, while the faradic response is still present. The pathogenesis of Melkersson's syndrome is similar to that of Bell's palsy, with an associated perivascular lymph stasis, and mild interstitial fibrosis as manifestations of the neurogenic disturbance in the circulatory system, of the face. The treatment should therefore, be similar to that for Bell's palsy; with X-ray therapy or plastic correction by appropriate excision of the oedematous tissues.

The ultimate goal of surgical procedures on the facial nerve is the physiological restoration of its function. Operation, such as decompression, end-to-end suture, nerve-grafting, or anas-

tomosis of the distal stump of the facial nerve to the central end of an adjacent cranial nerve effect this result in the large majority of cases. Lathrop considers that in respect of the last procedure, hypoglossofacial anastomosis is preferable to spinofacial anastomosis. If these fail, plastic surgery will be the only alternative for improving deformities of the face. Tumours of the facial nerve require adequate surgical excision, regardless of their location. The facial paralysis can then be relieved by repairing the defect in the facial nerve with a nerve graft or when the central end is inaccessible by anastomosis of the distal stump of the facial nerve with the hypoglossal or spinal accessory nerve.

Urinary incontinence in women—excluding fistulas: A new surgical procedure.—(*Acta. Obst. Gynaecol. Scandin.*, 1952: 31, 266 and *Internat. Abstr. Surg.*, Feb. 1953).

Dr. A. Ingelman Sundberg stresses the great importance of an exact diagnosis in cases of urinary incontinence. A case of stress incontinence is continent in the lying or sitting posture but in the erect position sneezing or coughing produces a spurt of urine. There is usually a history of child-birth. The cases of "scar-incontinence" give a history of pelvic or vaginal surgery with incontinence developing a short time afterwards. Patients with congenital malformations lack urinary control from childhood. Diverticula are often associated with dribbling after micturition and urine may be passed during coitus. Infected paraurethral glands and posterior urethritis have urinary burning as a symptom. When all these symptoms are absent, neurological disturbances should be considered. Careful examination of the incontinent patient is mandatory. Urinary leakage may be seen when the patient coughs or sneezes. Placing an Allis Clamp in the locally anaesthetized anterior vaginal wall and applying pressure anteriorly, will serve to make continent a woman with vesical neck descent (Marchetti test). A brief neurological examination should be done. Urethroscopy is of value in detecting urethral inflammation.

Cystometric tests are often helpful. X-ray examination reveals a pathological ptosis of the bladder-neck in cases of true stress incontinence.

Perineal exercises are effective in cases of slight incontinence but most patients are cured by simple vaginal surgery according to the techniques of Kelly, Stoekel and Kennedy. Ingerman Sundberg has devised a pubo-coccygeal repair to overcome any tendency to recurrence. He sutures the anterior portions of the completely divided pubococcygeal muscle under the bladder-neck. Over ninety per cent of patients are 'cured' by this technique. The various sling operations are extensive and their true appraisal is not known.

The urethra-kinking operation is the method of choice in patients suffering from fixation of the sphincter due to scar-tissue, congenital hypoplasia, or destruction of the sphincter and in cases of non-spastic bladder associated with a neurological lesion or enuresis. Patients with neurogenic urgency should be treated with parasympatholytic drugs. If this fails, resection of the inferior hypogastric plexus should be attempted.

Arsenical epitheliomas of medicinal origin.—(Arhelger, S.W., and Kremen, A.J., *Surgery*, St. Louis, 30, pp. 977-987, '52 and J.A.M.A., 54:53, p. 1251).

Arhelger and Kremen observed within a 2 year period (during which a total of 110 new cases of skin cancer were seen), eight cases of cutaneous malignancy and one of benign epitheliomatosis. This was certainly a fairly high incidence of arsenical cancers. Hyperpigmentation or melanosis and keratosis may occur before the appearance of skin cancer. The malignant lesions assume the gross features of the different types of cutaneous epithelioma (squamous, basal and mixed cell types). They may occur superficially and look like superficial epitheliomatosis; other lesions may simulate Bowen's intra-epithelial epitheliomatosis and occasionally the different types may all occur together. Enquiring into the past history of the case, one may come across

additional symptoms of arsenic poisoning e.g. disorders of the central and peripheral nervous system; hæmatopoietic disturbances, usually microcytic anaemia; chronic respiratory disturbances, such as pharyngitis, bronchitis, and even perforation of the nasal septum and gastrointestinal disorders, and cirrhosis of the liver. All the eight patients had received Fowler's solution in the treatment of such conditions as bronchial asthma, Sydenham's chorea, rheumatic fever, psoriasis or dermatitis. The interval between the exposure and the appearance of the malignant lesion was in most cases, over 20 years. Arsenical keratoses are potentially malignant lesions. Surgical excision is the treatment of choice for all surface lesions, showing recent changes in size or growth-rate or surface ulceration. X-ray therapy is indicated for small early lesions occurring above the nose, eyes or ears because of better cosmetic results.

Ileo-ileal intussusception due to Meckel's diverticulum and complicated by volvulus.—(Tagart, R.E.B., *Br. Med. Jour.*, 29th Aug. 1953).

Any increase in the bulk of a segment of intestine may cause it to become twisted on its mesentery. Among the causes of this increase in bulk which have been reported as causing volvulus are the ingestion of large volumes of cereal food (*B.M.J.*, 2:799, 1946) the presence in the bowel of a mass of worms, or some other foreign body, and a tumour of the bowel or its covering (*Surg. Treatment of the Abdomen* by Allen and Welch, 1947). Tagart reports a case, in which the increase in bulk was due to an ileo-ileal intussusception, the head of which had entered the ascending colon. The intussusception itself was caused by the invagination of a Meckel's diverticulum containing a polyp of gastric mucosa. A school boy aged 9 was admitted to hospital with dull abdominal pain to the right of the umbilicus, which started after a meal. He vomited twice and brought up the pulp of an orange, eaten 24 hours previously. This was the first attack of the kind he suffered. On examination the abdomen was not unduly fat

but a lump was visible to the right of the umbilicus. The mass was about 2 inches in diameter and appeared to be bi-lobed; it was freely mobile. Plain X-ray films in erect and supine positions revealed no abnormality. The presence of a position of relief suggested intestinal volvulus. The abdomen was opened through a right paramedian incision and 2 purple distended loops of the intestine—one the caecum and the other a coil of the ileum—presented themselves. The caecum and ascending colon were attached to the posterior abdominal wall by a mesentery 2" long and with the terminal ileum were rotated on this mesentery through 360 degrees in a clockwise direction. This volvulus was reduced without difficulty and the bowel at once resumed its normal colour. An ileo-ileal intussusception was then found to be present, the junction of the intussusceptum and intussusceptum was palpable in the ascending colon 1½ inches above the base of the appendix. The intussusception was reduced with some difficulty and it was found that there was a Meckel's diverticulum at the head of the inner layer. The invaginated intestine was deep purple in colour. The whole affected length was therefore resected and a side-to-side anastomosis made about 6 inches from the ileo-caecal junction. The abdomen was closed without drainage. Intestinal suction with intravenous fluid and electrolyte replacement were kept up for 3 days at

the end of which, peristaltic sounds became audible in the abdomen and an enema produced a good result. The patient was discharged cured on the 8th day.

Prevention of allergic transfusion reactions.—(*N. Y. State J. Med.*, 1:3-1953, *Abst. Cur. Med. Dig.*, June 1953).

A total of 1349 blood transfusion in the George Washington University Hospital included a series of 742 controls and a 607 experimental series to which 25 mg. of pyribenzamine was added to the bottle of blood to be transfused.

In the control series, 55 reactions were noted; 21 were of an allergic nature and 32 were pyrogenic. In the experimental series with pyribenzamine, there was only one reaction of an allergic nature, no pyrogenic reactions and there was one hæmolytic reaction.

The patients who had pyribenzamine prophylactically, had a considerably smaller incidence of transfusion reactions. It is important to note that the symptoms of the hæmolytic reaction, which is not a histamine reaction, were not masked by the addition of the antihistamine to the blood. The complete lack of pyrogenic reactions in patients who received prophylactic antihistamine tends to point to the fact that pyrogenic reactions may occur on an allergic basis as a response to histamine liberation.

EYE, EAR, NOSE AND THROAT

Topical use of heparin in ophthalmology.—(*Practitioner*, Jan. '53, p. 81).

Dr. Erik Jorpes, M.D., of Karolinska Institutat, Stockholm, writing on heparin and thrombosis, under *Current Therapeutics* mentions the work of Vannas. (Heparin on the Eye: *Acta Ophthalmol.*, '52) who found that a concentrated 30 per cent heparin ointment applied to the eye promoted recovery from iritis induced by bacteria, killed bacteria or serum sensitization in rabbits. It relieved the severe acute symptoms and shortened the duration of the disease. In cases of acute clinical iritis local

heparin treatment had a beneficial effect on the acute symptoms. The patient's subjective pain subsided rapidly. The large exudative coagula were resorbed from the anterior chamber in one to four days.

Cortisone in ocular disease.—(*Am. Jour. Ophthalmol.*, May '53, p. 81).

Parnell and Leopold report the results of treatment with cortisone of 202 eyes and also of their follow-up of about 150 patients previously treated and reported upon. Cortisone was used at the beginning by means of subconjunctival

injections, and where it was not found to be adequate systemic therapy was also given with cortisone. Miotics, mydriatics and hot compresses were also used along with cortisone. Uveitis, posterior uveitis and sympathetic ophthalmia responded very well to this treatment; while in 16 cases of anterior uveitis with secondary glaucoma, the glaucoma was found to be favourably influenced only in nine. Nine patients whose eyes which were quiet during surgery, had been subject to recurrent attacks of uveitis. These received cortisone subconjunctivally before the surgical operation. There was no recurrence of the uveitis in any of these and the wounds healed up readily in all.

Orbital implants.—(*Br. Jour. Ophthalmol.*, March 1952).

In the course of a review of the results obtained by him in 91 cases of orbital implants, Choyce states that 17 were of gold ring and 74 of hollow tantalum, and that only 25 of the 91 were found to be still in position, at the end of two years after the operation. Only five of these twentyfive were likely to stay on permanently. He considers that infection was primarily responsible for the loss of the implants in most cases and a secondary factor in the rest. A state of chronic infection was present in the unburied implants, causing a gradual loss of the implant. When the implants are not completely buried, infection can easily take place. It is therefore, important that only buried implants of preferably of acrylic or of tantalum be used for securing abiding results.

Treatment of cataract without surgery (?) Anopia and Fish lens protein injection.—(*The Sight Saving Review*, 23 : 2, Summer, 1953).

This important abstract is intended to dispel the wrong notion and hope, created in the lay mind, by premature and uncorroborated reports on the alleged successful results claimed for new drug and published in the lay press and also to let the practitioners know the real facts relating to such a claim.

The term "Anopia" was applied in 1952 by a Brooklyn group to a fish-lens-protein solution, for which a patent was sought and which they reported in *Science*, the official organ of the American Association for the Advancement of Science, as producing the following result upon injection in men and women with cataracts of the eye: "In all cases there has been a clearance of the opacities....."

Doubt as to the accuracy and reliability of these observations was soon expressed by competent scientists, as evidenced by a report published in the *Journal of the American Medical Association*, June 20, 1953 by the Committee on Ophthalmology of the Division of Medical Science, National Research Council, page 707. and by the Editorial, on page 710.

How these injections may jeopardise the sight of men and women who grasp at any straw to avoid eye surgery is revealed in a report from the January 24, 1953 issue of the *Journal of the American Medical Association*, by Dr. Adolph Posner of New York, who has recorded his experience and knowledge of approximately 1000 persons, all having cataracts that eventually may require surgical treatment, who have already been subjected to this drug (the lens-protein-injections) which have rendered them sensitive to their own lens matter and thus ended in failure.

An editorial in the March-April 1953 issue of the *Transactions of the American Academy of Ophthalmology and Otolaryngology*, Vol. 57: reports that the Committee on Ophthalmology of the National Research Council in Washington has adopted the following statement:

"Because of the total lack of evidence that the lens-antigen treatment of cataract described by Mr. R. F. Shropshire (*Science*, Sept. 12 : 1952, which probably formed the basis for the New York Newspaper correspondent for communicating to the lay press about the new drug) has any efficacy; because adequate evidence is now available to the Committee that it is, in fact, without demonstrable efficacy and because treatment of this type has been thoroughly investigated in the past and proved not

only invalid, but potentially dangerous to the patient, this Committee does not recommend further investigations of this treatment by any agency."

Electrosurgical treatment of glaucoma as a routine procedure—(Hurwitz, P., *The Eye, Ear, Nose & Throat Monthly*, 32 : 7, July 1953).

Cyclodiathermy, electrosurgical treatment, as a preferred procedure for certain types of glaucoma, is currently gaining in acceptance. Originally introduced in 1935-1936 by Vogt, the operation consisted of placing 40 to 100 diathermy micropunctures over a third of the ciliary body in a band 2.5 mm. to 8.0 mm. from the limbus. In spite of the high incidence of unfavourable complications e.g. cataract, corneal anaesthesia, iridocyclitis etc., cyclodiathermy continued to be practised as an operation of last resort for patients with absolute glaucoma and for unsuccessfully surgically treated primary glaucoma. The fear of sympathetic ophthalmia, as a result of cyclodiathermy, has persisted.

Recently, the modifications of cyclodiathermy by Weekers and Weekers and others have revived popular utilization of the operation. Weekers and Weekers employ a nonperforating electrode applied 6 to 8 m. from the limbus, and make 10 to 20 applications for 10 to 15 seconds each. This procedure has become, known as retro-ciliary diathermy. The modifications have produced appreciable results in secondary glaucoma, chronic simple glaucoma, and are of value also in infantile glaucoma. Success has been only partially favourable, however, in the congestive types of glaucoma. Cyclodiathermy is easily performed and the operation is relatively free from complications. Satisfactory results have been obtained by combining iridencleisis and cyclodialysis with flat cauterization of a superior segment of the sclera over the ciliary body. Reports by Scheic, on the application of cyclodiathermy techniques, indicate a wider range for the operation than was originally recommended by Vogt.

The immediate reaction of cyclodiathermy, perforating or non-perforating,

is an intense uveal vasodilatation. Subsequently, there is a cessation of the secretory activity of the ciliary epithelium. An intra-ocular hypotensive effect is evident within 24 hours. The case of the operation, its freedom from post-operative discomfort and complications, in addition to the prejudice of some patients towards hospitalization have made it popular with many patients.

This technique of cyclodiathermy has been employed by Hurwitz in:—

(1) hemorrhagic glaucoma, secondary to thrombosis of the central retinal vein;

(2) uncontrolled chronic primary glaucoma, with markedly constricted peripheral visual fields, but with good visual acuity;

(3) controlled chronic primary glaucoma as a prophylactic measure;

(4) chronic primary glaucoma, with senile nuclear cataracts, which is ideally suited for cyclodiathermy. In such cases the miosis, consequent to the medical management of the intra-ocular tension, prevents maximum visual acuity. Cyclodiathermy, in these instances, obviates the need of miotics and permits vision through the larger normal sized pupil.

Postoperatively, pilocarpine solution (2 per cent) is instilled and an antibiotic ointment applied. The operated eye is covered for 24 hours. Immediately after the operation, the patient is permitted to return home. Discomfort has been negligible. The day following the operation, the superior portion of the eye is mildly injected. The hyperaemia subsides within a fortnight. The tension may be taken on the first postoperative days. Subsequent use of miotics is unnecessary in most cases.

No complications have developed with this method of cyclodiathermy. Consistently, the cornea have remained clear and no lens changes have been observed. The conjunctiva has retained its smoothness and severely constricted fields have not been endangered. Improved visual acuity has been obtained in patients with nuclear cataracts. The fear of sympathetic ophthalmia is negligible.

Closure of tympanic membrane perforations.—(A. M. A. Arch. Otolaryngol. and Med. Jour. Austral., 6-12-52).

Adams states that after a perforation has been present for some time the epithelial outer layer of the tympanic membrane tends to grow over the margin of the perforation towards the middle ear. This leads to the formation of an epithelialized hole which has no chance to close up. If therefore, the epithelium could be discouraged from growing inwards until the fibrous and mucous membrane layers could form a structure or bridge for this migration, one might expect to close the perforation. With this in mind 12 perforations were treated by destruction of their epithelial lining with trichloroacetic acid. In this series there was permanent closure of 10 perforations and failure to close of two.

The acid was applied in 50% to 75% solution to the margins of the perforation by means of a fine cotton-tipped applicator. Whitening of the edges was noted after each application. It was usually necessary to apply the acid once or twice in every 10 days. Once a granulating edge was noted, weaker dilutions of the acid were used, pain being only of very short duration. In every case there was improvement and return to an efficient hearing level.

Vinegar as an antibiotic in chronic middle-ear disease.—(Arch.

Otolaryngol., abst. in Med. Jour. Austral., 6-12-1952).

Ochs states that clinical reports and many laboratory studies support the value of dilute acetic acid in wound cleansing and to inhibit the growth of bacteria especially those of the gram-negative group. Other acids have not shown the same properties. In a series of 38 cases reported on in this paper by Ochs, household vinegar which is the equivalent of 5 per cent acetic acid was used to treat chronic middle-ear infection. In 30 of the cases, it acted very effectively and quickly and cleared the infection. The ear is first painstakingly cleansed with cotton swab applicators and fine suction tubes. It is then dried as completely as possible. Boiled household vinegar is instilled into the external auditory canal to fill it completely. Suction is then used to displace air from the cavities and to aid penetration of the vinegar into less accessible cells. A tampon soaked in vinegar is then placed against the tympanic membrane, and left *in situ* for 2 days and then the procedure is repeated if any exudate is still present. Pain may be caused by the treatment of an acute condition by this method. In chronic conditions, little if any pain is caused. None of the ears treated by the author required more than 3 instillations of vinegar to eliminate the infection.

REVIEWS OF BOOKS AND PERIODICALS ETC.

Hints on the Assessment of Sub-Standard Risks in Life Assurance.—By B. B. Dorro, Chief Medical Officer of the Police Cooperative Life Insurance Society, Ltd., Author of:—Studies on Blood Pressure in Life Assurance Practice, Rudiments of Medical Insurance Examination, Medical Examination for Life Assurance, Selection of Risks for Life Assurance, Modern Treatment of Under-average Risks in Life Assurance, Certification of Death for Life Assurance, An Investigation on Blood Pressure, Physique and Medical Impairments of 5000 members

of the Calcutta and West Bengal Police Forces, etc. etc. Published by Sri Saradindu Dotto, 1953, pp. 91. 188A, Rash Behari Avenue, 1st Floor, Calcutta 29. Price Rs. 2/-.

The author who is one of the leading authorities on Medical Insurance work in Bengal has got together in this hand book, the methods of judging sub-standard risks in life assurance work. To the medical man who is taking up life assurance examination work, this book is bound to be very useful, particularly in the early stages of his career. Examination of a case for life assurance is not

very difficult. But some real difficulty will be felt in deciding whether a case can be grouped as first class or whether any extra premium should be charged by the company for the risks that have to be taken. The book under review details the various normal and abnormal standards together with the constitutional diseases that the medical examiner should look for during his examination of the patient. The difference between average and under-average life is clearly brought out. The contents are dealt with under forty headings, such as Historical review, Height and Weight of the Proposer, Habits of the Proposer etc. all of which are important points to be

taken into consideration in arriving at a correct classification of the proposer. The book also contains about sixteen tables giving blood pressure and life expectation data of various age groups. The book closes with an Occupational Rating Table in which all the occupations are alphabetically arranged, showing also whether a proposer of a given occupation is to be declined or accepted with usual or extra premium.

The book is well got up and neatly printed. The information contained in the book would be exceedingly useful to doctors engaged in life assurance examination work.

BOOKS RECEIVED

The following books have been received with thanks since 15-9-'53 and the courtesy of the publishers in sending them is acknowledged. Reviews will appear in due course.—Ed.

1. **Modern Concepts in Medicine**—By Dr. JULIUS JENSEN, Ph.D., M.R.C.S. (Eng.), L.R.C.P. (Lond.), 1953 The C. V. Mosby Company, St. Louis Price \$ 11.50.

2. **Glaucoma—Pathology and Therapy**—By Dr. PAUL WEINSTEIN M.D., 1953. The C. V. Mosby Company St. Louis. Price \$ 8.00

3. **Social Aspects of Disease**—By Dr. A. LESLIE BANKS, M.A., M.D., F.R.C.P., D.P.H., 1953. M/s. Edward Arnold & Co., London. Price 20s. Available from M/s. Orient Longmans Ltd., 36a, Mount Road, Madras-2.

NEWS AND NOTES

Electronics in medicine.—(B.I.S., B.F., 1666: 21-9-'53).

The wide range of electro-medical apparatus seen at the Exhibition of Electronic Devices held in Manchester recently is a clear indication of the growing interest British Engineers and Manufacturers are taking in harnessing the resources of electronic techniques to the use of the medical world. There is perhaps more scope in the diagnostic field for electronic devices. The most common instruments are:—the electrocardiograph, for amplifying and recording heart potentials, the electroencephalograph for brain potentials, and the electromyograph for the muscle potentials. The more specialised ones are: the auscultoscope—an amplifying stethoscope for heart and lung sounds, the phono-electrocardioscope for amplifying heart sounds at the same time as recording heart potentials, cardiograph-

meter to measure the heart-rate in beats per minute and the sphygmograph registers pulse waves in the arteries and veins. On the therapeutic side, the r.f. heater, is the best known; nowadays it is often used for making incisions and cauterising wounds; then, there are the stimulators for applying electrical wave-forms directly to the body, and also for generating flashes of light for visual and aural stimulation. One stimulator, made in Germany, is used for giving artificial respiration by applying electrical impulses to the stomach muscles; ultrasonic therapy is also developing very rapidly. Radioactive substances are now being used both for therapeutic and diagnostic purposes. Thyroid cancer can now be readily diagnosed by a dose of radioactive iodine.

Another new apparatus fast coming into use is the scintillation counter, in which the radioactive particles impinge

on a phosphor and produce flashes of light which are detected in a photo-multiplier tube. The output of pulses from the tube is then fed into an electronic counter, or rate-of-count meter, which indicates the strength of the radioactivity. Improved patterns were also shown at the Leeds University Exhibition, in which the interfering noise is eliminated. Another one was part of an extremely interesting apparatus built by the London University Institute of Cancer Research, which displays an image of the distribution of radioactive material in a patient's body on the screen of a cathode-ray tube. The great advantage of the television type of display is that the contrast of the image can be altered electronically as required.

Biological amplifiers using only one triode valve, were also exhibited. Lewisham Hospital showed an apparatus for amplifying and recording the heart sounds of unborn babies—useful in detecting changes in heart rate in direct physical distress. The signals are displayed visually and a meter indicates their repetition rate—(*Wireless World*, London, Sep. 1953).

UNICEF Executive Board Votes Further Aid to India

The Executive Board of the UNICEF at a recent meeting in New York has voted further substantial aid to India and other countries in the East. The funds voted will be used mainly for the continuation and expansion of the present programmes which were planned in the first half of this year, one of which is the Milk Conservation Plant at Bombay. A vote of 225,000 U. S. dollars (about eleven lakhs of rupees) has been passed for the provision of a small milk powder plant at Anand and for cooling and bottling equipment at Aarey. The purpose of of this UNICEF provision is to ensure an increased supply of safe milk to mothers and children, at a cheaper rate and the utilization of the entire output of the Anand area during both flush and normal periods of milk-yield, so that it may be used for feeding without wastage or diversion. A sum of 104,000

U.S. dollars (about 5 lakhs of rupees) has been voted for development of Maternal and Child Health Services and Training in Travancore-Cochin State. Existing programmes will receive additional aid to the tune of 613,000 U.S. dollars (about 30 lakhs of rupees). The UNICEF is not a charitable organization but a cooperative one, between itself and the Governments of the countries receiving aid, acting under the advice and help of the WHO and the FAO etc. The total funds voted for India up to date by the UNICEF, amount to 9,700,000 U.S. dollars, the equivalent of about five crores of rupees.—(*UNICEF Press Release*, 21-9-'53).

Indian Medical Association

Dr. S. C. Sen of New Delhi was elected President of the I. M. A. for 1953-54 at a meeting of the Association's Working Committee held at Lucknow on 6-10-1953. The Committee elected Dr. D. V. Venkappa of Madras as the Senior Vice-President and Drs. Samaddar of Patna, and Kapur of Ludiana as Vice-Presidents: Dr. C. L. Mehta of Bombay was elected again as the Committee's representative on the Employees' State Insurance Corporation and Drs. C. S. Thakar of Bombay and Dr. (Mrs.) Thungamma of Banaras to the Corporation's Medical Benefit Council.

WHO Regional Course

The Sixth Session of the WHO Regional Committee for S. E. Asia ended at Bangkok on 22-9-'53 after 4 days of intensive discussion in which plans for more than 100 health projects of direct assistance to the ten member countries during 1955 were approved. The 1955 plans as adopted by the Regional Committee under the Chairmanship of Dr. Abdul Rahim of Afghanistan, will now be sent to Headquarters of WHO at Geneva for inclusion in a world wide coordinated programme, which will be reviewed by all the State Members in May 1954 during the Seventh World Assembly.—(*U. N. Weekly News Letter*, 29-9-53).



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is the antibiotic of choice in most mouth disturbances".

Drs. Pollack and Archer report similar results in the *Pennsylvania Dental Journal*.

Dr. Lane *et al* state in the *Journal of Oral Surgery* that terramycin treatment eliminated the need for surgery in four cases of cellulitis in the deeper mouth tissues. Dr. Osserman found the antibiotic successful in over 90% of more than 200 patients with cellulitis, showing that modern conservative surgical procedures will succeed where formerly radical procedures would have been indicated.—(*M.F.I.B.*, Aug. 1953).

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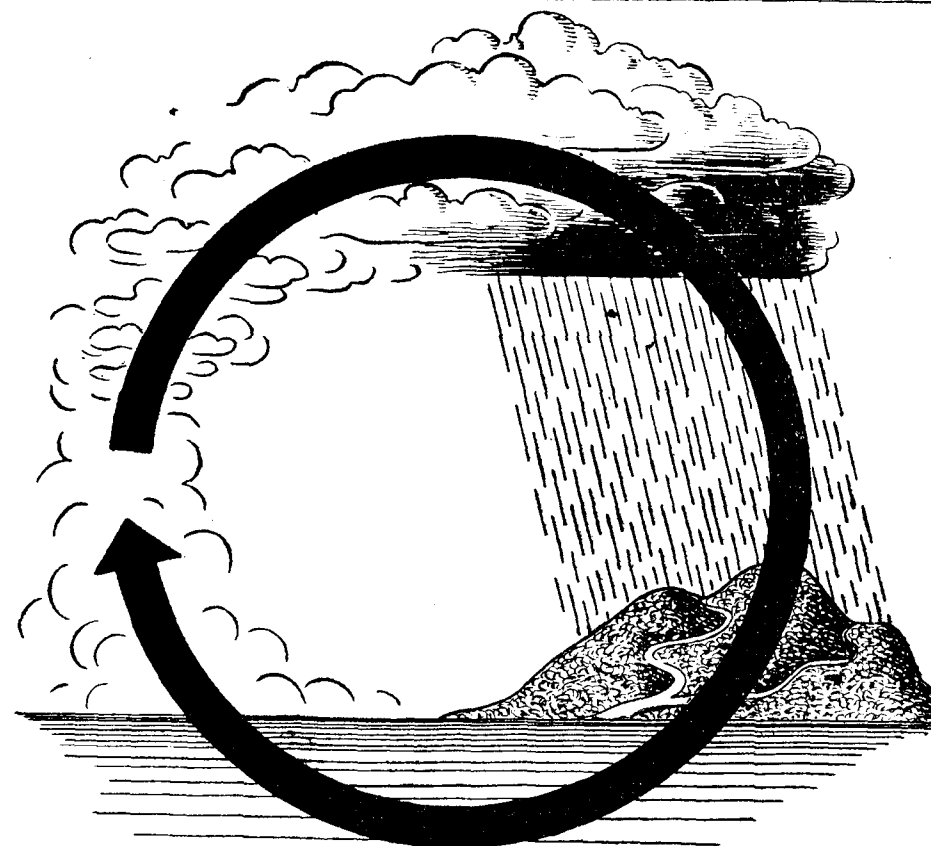
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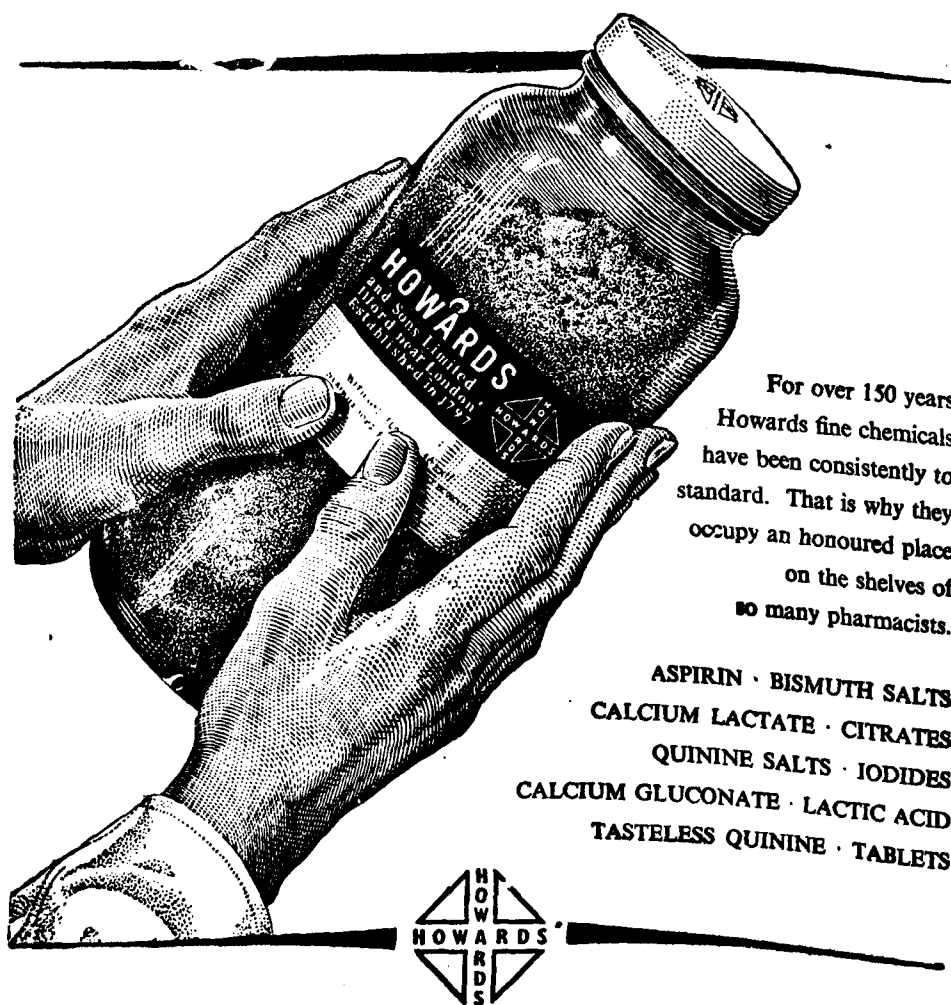
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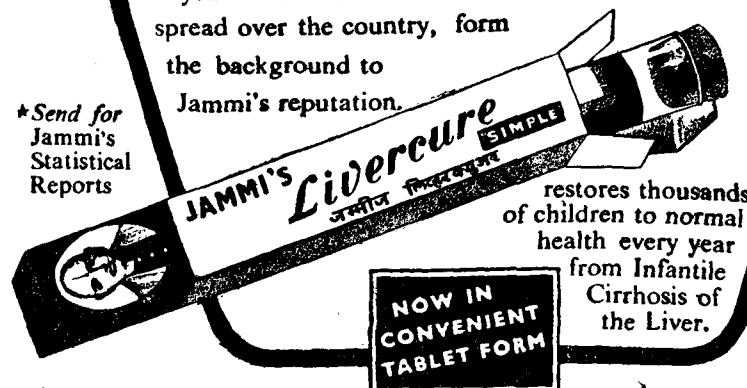


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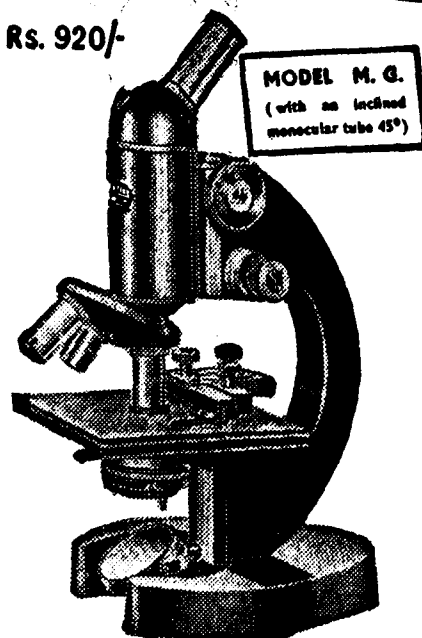
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2. S. N. Sanyal, *Cal. Med. Jour.*, 49, 354, 1952.

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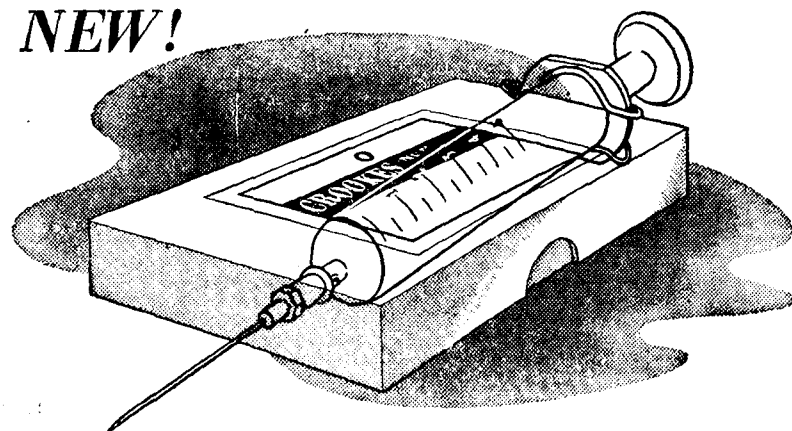
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(or Typhoid 11-0 Sythamycin 12	Enterokinol 20 2-4; 100's 9-12	Normal Saline 100A x 500 4-0
Auromycin 8 Cap. 19-0 [13-8	Vegetable Lex. S/c 1000 8-8	Redoxen 6x200. 4-12; 50x200. 36-0
Terramycin 8 Cap. 16-14; 16 32-8	Leucarson MB tab 500's 12-0 bot	" 3x500. 4-2; 25 x 500. 27-12
Diorystecin 2-4 Seolomyoin 2-4	Stovarsol " " 36-8 "	Sandoz Cal. Gluco & Vit C.
Ambistryn Squibb 3-4	Nicotinic Acid 500 1-10	5 x 10 c.c. 6-8; 10x5 c.c. 10-14
Pan-Strepto Merck 2-12	Cibazol 250's 13-4; 20's 1-10	Sandoz Cal. Glu. 10% x 10cc 5 amp 5-2
Pro. c Mycin (like Combi.) 1gr 2-12	MB 760 27-0; MB 693 500's 36-8	" " " 5 c.c. x 10 8-12
Streptocain (") 1gr 3-0	Riboflavin tab 250 x 1mg Roche 2-0	" 50 amp. 44-12 100 c.c. x 20 19-6
Camequin 7-4 doz; Loose 3 Tab 0-7	Merck H.T. Emelin 1 gr. or 1 gr. 3-8	Sulphamezethin 25 amp. 4-0
Penicillin G Cryst. [" 100 13-8	Resochin tab 10 1-12; 100 13-14	Omnopon Amps with Needle
" 2 5 10 laos.	Yeast Tab. Eng. 5gr 4-4; 7gr 5-4	Tooth Forceps 4-4 [Tube 0-8
" — 0-10-0 1-1-0 1-12 Glaze	Soda Mint " 2-10; Ind. 2-0	H.T. Ind. Morph. Sul 1 gr x 20 2-8
" — 0-9-8 1-0-3 1-10-6 Dumex	Sulpha Tab. 1000 500	" BW " c Atropine 1 gr x 20 4-0
Dihydro Strepto 1gr Pfizer 1-11-0	" nilamide Eng. 10-8 5-4	Ind. Morph Sulph 1gr 12 amp 5-8
Glaxo, Belg. or Rhodia 1-6-9	" guinidine 16-0 8-8	TCF. Vit. B Complex 6x 200 4-3
Procain Penicillin 20 laos Gl. 3-14	" MB 500 13-4 Boots 8-12	" 1000 3-4 25 x 100 10-14
" " Dumex 3-10 1/2	" thiazole, 17-0 " 19-8	" W. Liver Ext. 10 cc 3-0
4 laos 1-0 2-4 1-1 1-3	" mezathine (100 6-8) 27-0	" " " c C & B 1000 4-4
3 laos x 10 cc. Oily USA 5-8	" diazine 100 8-12; 500 37-8	Vitamin K 100 amp. BW 18-12
Penicillin Skin Oint 1-4 Eye 0-13	Sulphatone (100 10-0) 42-4	Thermometer Germ. 1-2 Jap. 0-11
Vit. B12 100 micro Belgium	Sulphatriad MB (100 8-8) 41-8	" Zeal 2-6; USA 1-2; Eng. 1-4
1000 5-10; 5 cc 3-8	Sulphonamide Powder 1 lb. 7-0	" Hicks 3-4; Beacon Flat 1-7
50 micro " 3-8; 1000 3-0	" cream 4 oz. Lilly 6-0 doz	B.D. Stethoscope 20-8 Triple 34-0
Vit. B; 100 mg 1000 3-0	" 1 oz. " 2-0	Beacon Stethoscope (B.D. type) 7-6
" C 500 mg x 500 x 5 A 3-6	Gentian Violet Jelly 4 oz. Lilly 6-8	Plastic tubing 1-2; Rubber 0-14 yd.
" 20 A 18-0	Bis Carb 2-0; Cadina Citrus oz 1-8	Germ. Forcep 2-4; Scissors 2-0
" Ext. 10 cc Belgium	Calomal 1-2; Chlorobutol oz. 1-4	Detecto Weighing Machine 55-0
2 USP 2-12; 5 USP 3-14; 10 USP 5-14	Codina Phos 5-2 Dionine dr. 6-12	Saline Appar. comp 300cc. 7-8
PAS "b. Eng. 100 3-4; 500 15-0	Ethyl Chloride 100gm. Ger. 2-2	Scalpel Germ. 3-0 [500 cc. 10-8
" 100 3-10; 250 8-0; 500 16-0	Ext. Ergol. Ind. 4oz 3-8; lb. 10-8	Abc. Cotton 1-10; Lint 3-4
P.A.S. Dumex 100gm 6-0 lit. 3-10	Gentian Violet 1-12 Menthel oz 2-8	Abc. Gauze 2"x2" 200 pieces 1-12
Quinine Jap. 42-0; Java 50-0	Sedasy 3-12 lb. Santonine dr. 4-1	Bandages 3 1/2 yds. x 1" to 6" 0-8
" Roche 55-0; Howds 61-0	Santonin Synthetic German	Hot water bag 3-4; Ice bag 1-10
" 1 oz Jap. 3-4; Howds 4-8	1 dr. 2-14; 1 oz. 18-0 [3-12	Hypo. Syringe (S.N. Re. 1 mere)
Q. Bihydro Amps. 100x10grax200.	Oil Chinapodi oz. 4-8 Aspirin	A.G. Jap. 2 5 10 20 30cc.
" Ind. B.D.H. B.W. P.D.	Petas Chloris 1lb. 3-9; tab. 1000 6-0	" 0-9 0-13 1-2 1-0 1-12
" 11-0 22-0 32-4 47-8	Silver Vitelin France 2-12	Italy 1-0 1-8 2-0 3-4 5-8
" 9-12 14-8 100x5gr. x 100.	Protargol 2-2 Pot. Bromide 3-6	Germ. 1-0 1-1 1-14 2-8 6-8
Enquinine Howd. 7-8; Java 7-0	Aletaris Eng 2-4; Rio USA 9-12	Record Ger. 3-8 5-0 6-0 9-0 11-4
Jap. 7-0 German 7-0	Wincanis 8-8; Waterbury Co. 6-8	" Italy 3-1 4-2 5-10 8-8 10-8
Q. Tab. 2grx100 3-0 5gr 5-0 Java	Acetylarsen Adult 6-6 Child 4-12	" Complete 6-0 9-0 11-0 — Germ.
" 5 gr. 1400 How. 71-0	Atebrin Amp 3 gm 25 amp 14-8	Boston 4-4 5-0 6-0 9-12 13-4
Q. Bihydro 2grx100 3-4; 5gr 6-8	" 0.1 gm. 6A 3-6 50 amp 24-0	B.D. Lock 8-8 13-4 15-4 18-0 23-10
Pamaquinine 500 1-0 [Roche	Atophanyl Amp. IV or IM Ger. 5-2	Japan " 1-8 2-6 3-0 4-0 5-4
Atebrin Bayer 1000 12-8; 300 6-6	Berlin 50mg. 3-2; 100 mg. 4-5	" Metal case 2-8 3-8 4-8
Aspirine 1000 Eng. 5-14; Ind. 4-4	Calci Ostalis 15cc. 3-3 Entedan 8-0	Ind. " 1-12 2-4 3-4 3-8 6-0
Mepacrine Eng 1000 8-8; 100 9-10	Campolan 5x200 5-7	Hypo Syringe 50 cc. S.N.
Quinaquine MB 1000 9-10	Cal. Glu. 10% x 10cc. 100 amp. 12-0	Jap. 3-8; Italy 8-0; Germ. 8-12
" USA. 5000 39-0; tin 1000 8-8	" pow 3-3 lb [500 9-12	B.D. Luer Lock 34-0; Jap. 7-0
Ephedrin 1/2 Gr. 1000 5-6 Germ.	Campor-in-oil 3 gr. x 100. x 100A	Record Needle (Perfectum 5-0)
Entrovisform 20's 2-14; 100's 11-8	" 3grx12A Evans 1-0 [5-0	Jap. Germ. Star. D.B.
Paludrin 1000 x 1 gr. x 20-12	Distil Water 100 amps.	1-8 1-10 3-8 4-0 Dz.
" 3 grm x 500	2 cc. 3-0; 5 cc 3-8; 10 cc. 5-0	All Glass Needles Luer Mount
Gynamin tab 2-0; Spiton tube 2-8	Emetine Hydr 1gr. x 12 amp BDH 7-8	Jap. 2-4 Ger. 3-4 D.B. 4-8 B.D. 10-8
Multivitamin USA Orig. Ente-	Thilo 6-0 BW 8-8 Ende 6A 3-0 PD 6-0	F.L. Durex Tin. 2-0 doz. Pkt. 1-12
Vio coated 100 3-12; 1000 19-4	" 50 amp 22-4; BDH 25amp 14-4	F.L. Washable Ger. 1-4; Ind. 0-8
Vit. AD Cap. 500's 15-0 [14-0	Emetine Hyd. 1gr 12amp BDH 12-12	Ear, Metal Syringe 2oz. 5-0;
Felic Acid Tab 5 mg. 25 3-10; 100	Thilo 50A 40-0 12A 10-12 PD 6A 9-0	Sterilizer 6" 12-0 [4 oz. 6-0
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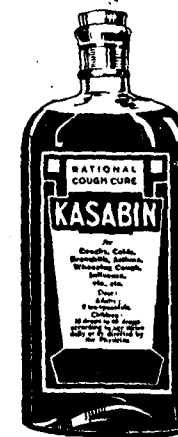
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