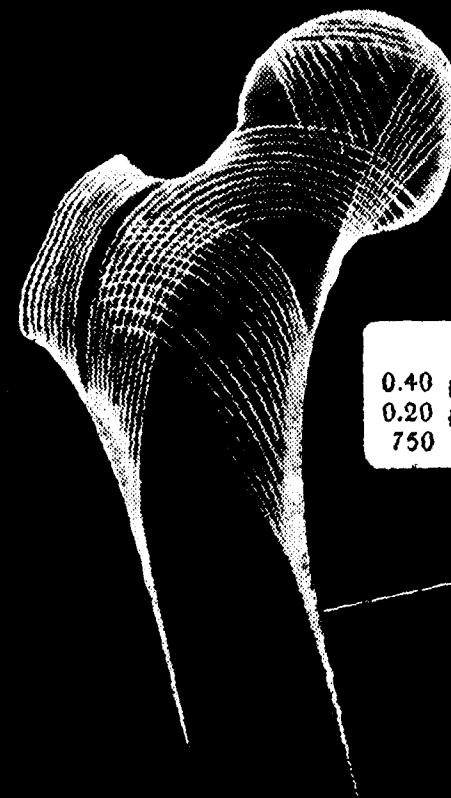


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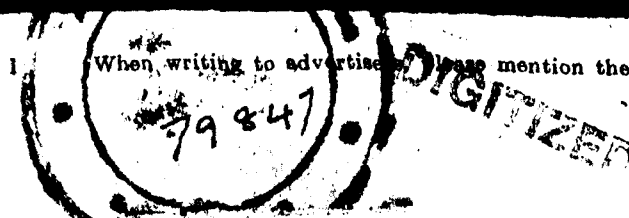
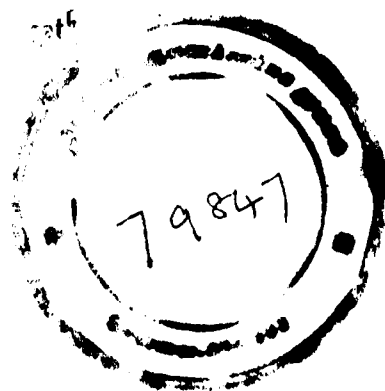
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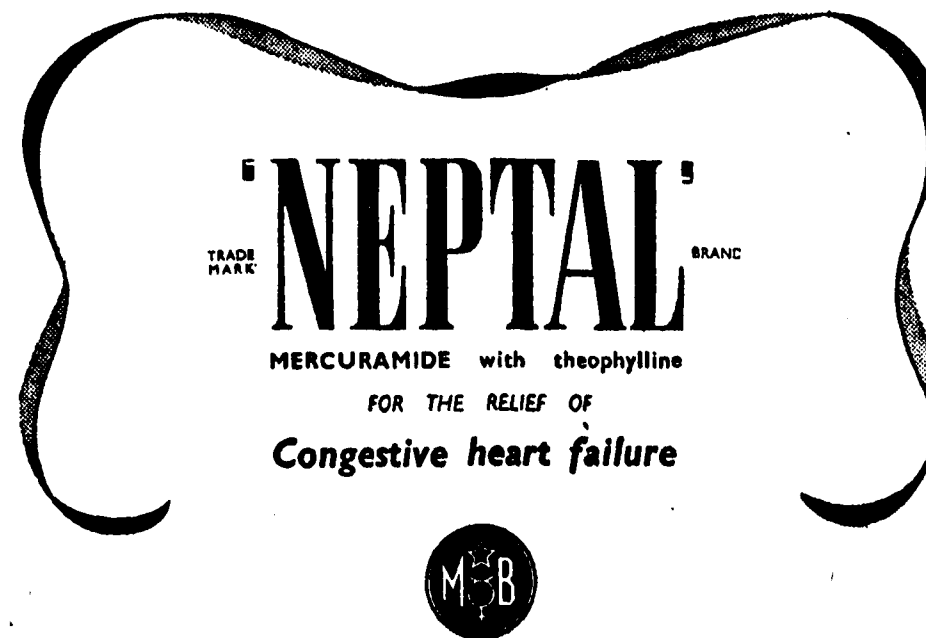
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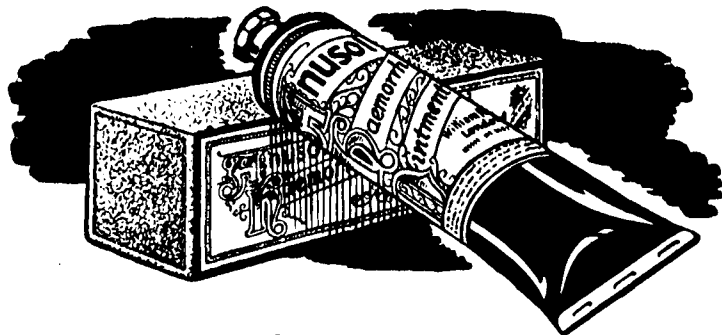
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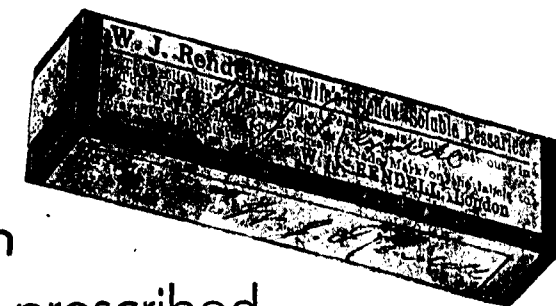
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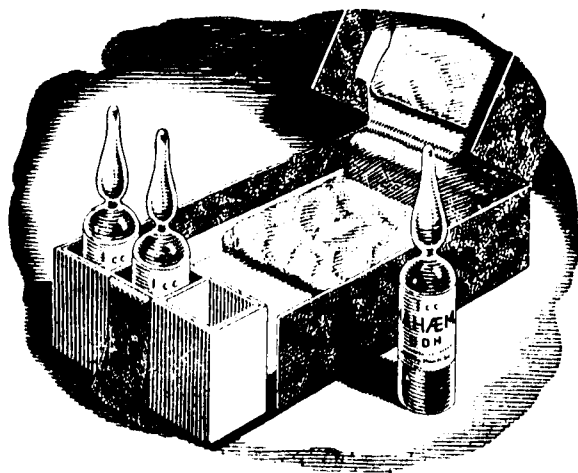
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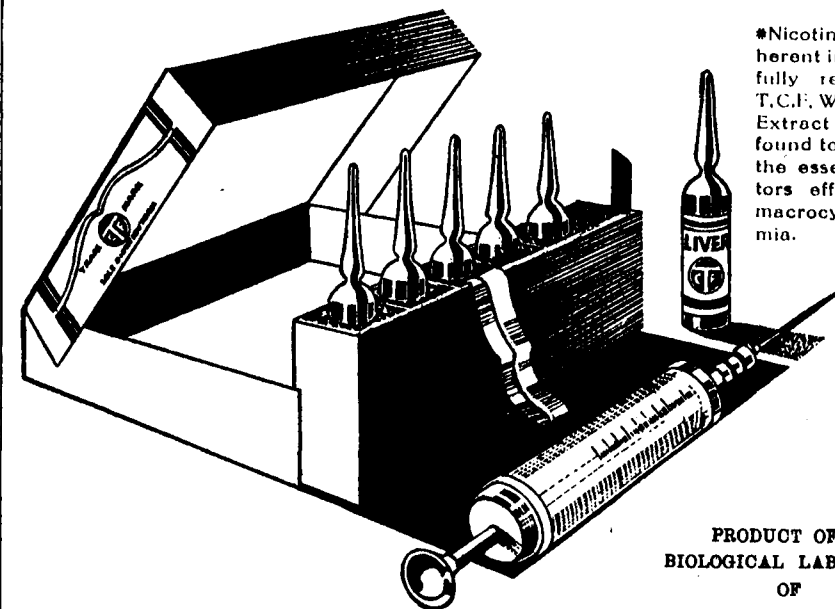
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No. 1.

Original Articles

Diagnosis of Enteric Fever*

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THE methods of culture of Eberthella Typhi, the serological agglutination reactions and their interpretation as well as our knowledge of the bacteriology of the organisms have made such an advancement during the last decade, that we need no longer depend for our diagnosis on the clinical cardinal manifestations of the disease, however remarkably constant they are. The latter have thus been relegated to the background but may prove to be of value in places where laboratory tests cannot be done. Many a case of enteric can be diagnosed clinically but it is always the laboratory methods that clinch the diagnosis in the doubtful cases. The agglutination reactions are in themselves highly diagnostic and can no longer be questioned as to their true value. The recent method of bone marrow culture is so perfect that an early definite diagnosis can be made within a few days of the onset of disease. Every undiagnosed fever, especially in the tropics, should be suspected to be enteric and closely observed; and at the same time laboratory investigations carried out.

The "diagnosis" can be dealt with under 3 sub-heads:—

- I. Clinical diagnosis: (1) History; (2) symptoms; (3) examination of the patient (inspection, palpation, etc.).
- II. Laboratory diagnosis: (1) Bacteriological: (a) bone marrow, (b) blood, (c) urine, (d) faeces; (2) serological: (a) widal, (b) felix; and (3) other auxiliary tests.
- III. Differential diagnosis.

I. **Clinical diagnosis.**—Great majority of cases can be correctly diagnosed clinically, though there are a few atypical cases.

1. *History*:—No history of previous attack of typhoid, as one attack usually confers immunity.

The *history of present illness* is "continuous fever of gradual onset with

* Specially contributed to 'The Antiseptic.'

step-ladder-like rise of temperature ;" though rarely in ambulatory typhoid there may be slight or no fever.

2. *Symptoms* :—(a) Characteristic frontal headache which is very severe during the first week but which subsides after the 8th day, and which does not respond to analgesics ; (b) epistaxis at the onset in some cases ; (c) the patient may complain of pain or uneasiness in the abdomen ; and (d) the bowels may be either constipated or loose (pea soup stools).

3. *Examination of the patient* :—*Inspection* : (a) Note the age : usually adolescents and adults ; (b) *Characteristic facies and toxæmia*. The face is moist with flushed cheeks ; the look is dull and apathetic ; there is cloudiness of mind (*typhos*). Also there may be typhoid state and subsultus tendinum with picking at the bed clothes. These occur in the beginning of the second week and are so characteristic that diagnosis can be made confidently by a glance. In some cases there may be muttering delirium, or, later still, stupor with coma vigil. In mild paratyphoid cases there is no toxæmic appearance ; (c) characteristic *pale pink coloured spots*, (circular, elevated, fading on pressure) appear in crops on the trunk on the seventh day of the fever. These fade away in 3-4 days. These are rarely seen in Indians. They are more common in para typhoid A infections ; (d) the tongue is characteristically dry, furred and coated in the middle but free at the tip and edges ; it becomes more furred and toxæmic in second week, when sordes appear on teeth and the lips become cracked ; (e) *abdomen* : slightly tumid especially in second week.

Palpation :—(a) *Pulse* is slow during the first week being only about 80 ; it is soft but full ; becomes proportional to the temperature and dicrotic in typical cases during the second week ; (b) there is gurgling and tenderness in the R.I.F. ; abdominal reflexes on the right side are lost in the first ten days and then reappear. A distended bladder due to retention of urine may be felt in the early days. On the seventh day the spleen becomes palpable ; it is soft, tender, ("angry") but it recedes in a few days.

Percussion :—Distension of bladder can be confirmed by percussion when it is present.

Auscultation :—May reveal a co-existent or complicating bronchitis or broncho pneumonia.

II. **Laboratory methods** of diagnosis must be done in every case of undiagnosed pyrexia. These are essentially of 3 types :

1. *Bacteriological* : Isolation and identification of the organisms. They may be isolated from (a) bone marrow ; (b) blood ; (c) urine ; (d) faeces and also rarely from other secretions such as bile, sputum, C. S. F. and pus.

(a) *Bone marrow culture* is unquestionably the most satisfactory method of diagnosis. This is positive in 90% cases while the blood culture is positive only in 50% cases and that only if done in the first week. The former gives positive results even after the first week but it is negative in the convalescents. Thus, when successful, bone marrow culture furnished the conclusive evidence that the patient is suffering from active enteric fever. Do a *sternal puncture* and inoculate $\frac{1}{2}$ -1 c.c. of the material into a bottle containing 5 c.c. ox bile broth and incubate. After 24 hours sub-inoculate on Agar Slope, on Meconkey's medium and on Meconkey's plate. Look for any growth after another 24 hours and identify the organisms of the growth as—

The pink colonies on Meconkey's plate are lactose fermenters and belong to *Escherichia* (non-enteric group) while the colourless colonies are non-lactose fermenters. Take one of the latter by means of a platinum loop and prepare a saline suspension.

(i) Make a *hanging drop preparation* from this suspension and examine under high power for motility. The *Eberthella Typhi* are highly motile bacilli.

(ii) Make a smear of the suspension on a slide ; fix it and stain with *Gram's stain* and examine.

The bacillus typhosus are gram-negative. Peritrichate flagella may also be seen.

(iii) *Biochemical reactions* : Keep the following sugar tubes (containing 1% peptone water and 1-2% sugar) glucose, lactose, sacchrose, maltose, mannite and dulseite and also 2 tubes containing litmus milk and Indol respectively in a rack. Add 3 drops of the Saline suspension (baccillary) in each tube. Incubate at 37° for 24 hours. Then look for acid and gas in the sugar tubes. If no sugars are fermented the organisms are *B. Fæcalis Alkaligenes* ; if lactose is fermented, they are *Escherichia* ; and if lactose is not fermented they belong to either *Eberthella* or *Salmonella* (Para A, B, C). If there is production of acid only but no gas in glucose tube, the organisms are *Eberthella* (typhoid or dysentery groups) but if there is acid and gas they belong to *Salmonella*. These two groups produce only a faint acidity and no coagulation in litmus milk and do not form Indol. *B. Typhosus* do not ferment dulseite but paratyphoid group do. *B. Dysenteriae* group is excluded as it is non-motile and does not possess flagella as *E. Typhi* do.

(iv) *Slide agglutination* with high titre sera is the quickest and most clinching method for identification of the organism and is based on *Bordet-Durham* reaction. The isolated organisms are tested for their agglutinability against a known serum of high titre (1 in 2,000) prepared by inoculating rabbits. Place a loopful of the suspected colony so as to yield a uniform turbid emulsion. Then on each spot put a loopful or two of specific H. T. Sera : rock the slide for a minute. With a hand lens see whether there is flocculation. The control is uniformly turbid. If there is *flocculation* it means the organisms are *E. Typhi* or Para A or B or C as the case may be. The only fallacy in this method is that agglutination may not occur when the culture is fresh. So when negative it is necessary to do a subculture on Agar slopes and to repeat this test after another 24 or 48 hours.

(b) *Blood culture* :—Next in importance is blood culture, which is however useful only when the blood is taken during the bacteriæmic stage i.e., first week. It is bound to be negative if attempted late in the course of disease.

Observing aseptic precautions draw in a syringe sterilised in boiling vaseline 5 to 10 c.c. of blood from antecubital vein and at once put it into a sterile bottle containing 25 c.c. of fresh sterilised ox bile or 25 c.c. of Taurocholate broth and incubate it for 24 hours at 37°C. With a platinum loop remove a small quantity of the supernatant fluid and inoculate on agar and Meconkey's media and again incubate these for 24 hours. See whether there is any growth ; if so, identify the organisms present as mentioned above. It is important that the quantity of blood taken is not less than

5 c.c. The blood may also be drawn in Behring's venule containing ox bile or glucose broth. If blood has to be sent by post, add $1\frac{1}{2}$ c.c. of sterile trypsin to prevent clotting etc. Usually the two gram positive organisms staphylococci and *B. subtilis* are prone to contaminate the specimen taken and grown in culture.

(c) *Urine culture*: The organisms are present only for a short period in the urine and that only intermittently. Take a catheterised specimen or at least in males midstream urine; mix with 3 volumes of Peptone water and Brilliant Green. Inoculate a platinum loopful on McConkey's plate and incubate for 24 hours. Examine for N. L. F. colonies and identify the organisms. Urine culture should be done invariably in all cases of undiagnosed fever when the blood culture is negative. Bacilluria occurs generally after 14th day and only in 20% of enteric cases.

(d) *Motion culture*: Though the organisms are present in stools from first week till complete convalescence and even later, culture is positive only during 2-4 weeks. This is more valuable in detecting carriers. The specimen of stools must be fresh, else *E. Typhi* are killed by *B. coli* and other saprophytes may grow. These are prevented by adding 30% Glycerine in 6% Saline as well as Brilliant Green. So first emulsify a loopful of stools in peptone water containing Glycerine and B. Green. Inoculate a drop of supernatant fluid on McConkey's plate; incubate and after 24 hours examine. Faeces culture must be repeated during convalescence to determine whether he is free from infection. This culture is positive only in 5% of typhoid cases; even the positive cultures are open to the fallacy that these cases may be carriers suffering from non-enteric fever.

2. *Serological diagnosis* is next in importance only to bone marrow or blood culture; it has been recently improved and its fallacies have been minimised. To interpret this *widal reaction* and to modify it so that it may be more authentic, our knowledge of immunity, agglutination etc., must be up to date. The *E. Typhi* consist of 2 elements.

(i) Bacterial body—'O' antigen—which evokes a response—the antibody 'O' agglutinins which are heat stable, and produce fine compact lighter clumps that settle as granular deposits in the Widal tests and that are not easily dispersed by shaking. 'O' agglutinins are the result of active infection by a member of the enteric group and do not identify the organism; however, they take part in the production of active immunity; (ii) 'H' antigen consisting of flagellar elements produce 'H' agglutinins which are destroyed by heat, which produce large loose floccular clumps that are readily broken up, which are the result of passive immunisation and which do not play a role in the production of immunity. The 'H' antigen is specific and distinguishes the organism present and it is present alone in Dreyer's formolised suspension. The 'O' antigen is common to the enteric group and is present in the alcoholised suspension.

A prophylactic T.A.B. Vaccine produces in the serum both H. & O. agglutinins. The former reach a very high titre limit; it is maximum in three weeks of the inoculation and then the titre falls gradually and disappears after some time. In these persons a non-specific stimulus (any non-enteric fever) will cause a high titre reaction (*anamnesic reaction*) and thus in them the 'H' agglutination reaction (*classical widal*) is not of any diagnostic use. The 'O' agglutinins, however, evoke only a low titre value (less than 1 in 100) but protect the person against infection for 1 year

definitely. Thus the presence of 'O' agglutinins to a titre of greater than 1 in 100 shows definitely an active enteric infection even in the inoculated persons but does not show whether it is typhoid or para A, or B, or C; (i) so in all inoculated persons this 'O' reaction must be performed using 'O' antigens; (ii) also *felix technique* may be done in them for To, Ao, VI and RV agglutination; (iii) another method of diagnosis in these persons is to repeat widal thrice or so during the course of the illness and a rising titre (*quantitative widal*) is in favour of an active infection with the particular organism.

In the uninoculated person ordinarily the classical widal using Dreyer's technique with formolised suspension suffices for diagnostic purposes—for detecting 'H' agglutinins and in them it is the technique of choice.

(a) *Widal test* is of 3 types: (i) classical; (ii) quantitative; (iii) qualitative.

(i) *Classical widal*:—For routine diagnosis this is done. If correct technique is employed it leads to a correct diagnosis in a majority of the cases especially in the uninoculated. The underlying principle is that the blood of an enteric patient develops agglutinins that are capable of agglutinating the specific bacillary emulsion. *Technique*: Keep 5 Dreyer's dilution tubes (Kahn tubes) in a rack. Put 2.3 c.c. Normal Saline in the first and 1 c.c. in each of the other 4 tubes by means of a 2.3 c.c. pipette. Centrifuge 1 c.c. of the patient's blood and take 0.2 c.c. of the supernatant serum in a 1 c.c. pipette which is divided into 5 parts and put it into the first Kahn tube and mix well by drawing the fluid in and out. Pipette off 1 c.c. of diluted serum into Kahn tube II and mix well. Repeat so that the dilutions are 2/25, 2/50, 2/100, 1/200, and 2/400. Then take a Dreyer's rack and put 5+2+2 = 9 Dreyer's agglutination tubes (widal tubes) and another 3 tubes on the right hand side to serve as control. By means of a pipette put in each of the first 5 tubes 0.2 c.c. of an emulsion of *B. Typhosus* (T) so that dilution becomes 1 in 25, 1 in 50, 1 in 100, 1 in 200 and 1 in 400 and another 0.2 c.c. in the first control tube (T). Then put 0.2 c.c. of emulsion of *B. para typhosus* A (A) in each of the next 2 widal tubes so that dilutions are 1 in 25 and 1 in 50 as well as another 0.2 c.c. of A in the second control tube (A). Similarly repeat with (B) emulsion. By means of Dreyer's pipette put in widal tube V 0.2 c.c. of the 2 in 400 dilution serum; in tube IV 0.2 c.c. of the 2 in 200 serum; in tube III 0.2 c.c. of the 2 in 100 serum; take 0.6 c.c. of 2 in 50 serum from Kahn tube and put 0.2 c.c. in each of tubes T II, A II and B II. Similarly take 0.6 c.c. of 2 in 25 serum and put 0.2 c.c. in each of T I, A I and B I. Then put 0.2 c.c. of N. Saline in each of the three control tubes (T, A, B). Mix each well and put the rack in Dreyer's standard bath at 52° C. for 2 hours and the temperature should never be above 52° C as the 'H' agglutinins are heat labile and are then destroyed. After 2 hours take the rack out and allow it to stand for 15 minutes. Wipe the outside of the tubes and by means of hand lens and with reflected light look for agglutination i.e., *flocculation*—there need be no sedimentation. The 3 control tubes should not show any flocculation, and, if they do, repeat the whole test using this time a different bacillary emulsion prepared from a fresh subculture. The tubes showing uniform haziness must be regarded as negative. It is important that the patient's blood is not hemolysed.

Normal blood serum does not show an agglutinability greater than 1 in 10 or 1 in 20. A titre result of 1 in 50 for T and B and 1 in 25 for A is

only suspicious. But higher titres 1 in 100 or 200 are definitely diagnostic in the uninoculated. Widal is positive even 6 months after the infection in carriers.

This classical widal test fails in (1) early diagnosis of enteric because a negative result occurs during the first ten days of the disease; (2) a few cases of para A that fail to develop the agglutinins giving a misleading negative result; (3) in cases of infection with non-motile strain of bacilli (felix); and (4) in those inoculated with T. A. B. Vaccine or in those who have previously suffered from enteric fever there is a *false positive result*.

If widal test is negative, contrary to the clinical findings then the test has to be repeated twice or so during the next few days.

(ii) *Quantitative widal*:—Dreyer found that if widal's test is repeated number of times during the course of enteric fever, there is a steady rise in titre value to a maximum (*rise in titre*) between 16-24 days and then there is a gradual fall. This rising titre of 'H' agglutination for the particular organism shows in a majority of cases active infection. But in a few percentage of cases of enteric this rise may not occur (in cases of infection with non-motile strain) and in some non-enteric cases it may be present. Thus its value as a pathognomonic reaction is limited and inconclusive. In the inoculated person this 'rise in titre' is useful for diagnosis and so Widal's test must be done repeatedly.

(iv) *Qualitative widal*:—It is essential to do this test ('O' agglutination reaction using 'O' antigens for detecting the presence of 'O' agglutinins which are produced only by the specific stimulus of active enteric) in all cases in which 'H' agglutination reaction is of no value and in which the classical widal is apt to be misleading. In inoculated persons the anamnestic reaction can be definitely excluded if this qualitative test is done. But a positive 'O' reaction only signifies that the disease is due to the enteric group of organisms but does not identify the exact one.

Even these 'O' agglutinins may appear late or not at all in some cases, thereby showing a bad prognosis.

(b) *Felix technique* is done in all cases inoculated with T. A. B. Set up a rack of 4 rows of 7 tubes each and label the rows To, Ao, Vi Rv. Add 1 c.c. of Hg. 12 diluent solution 1 in 5,000 (it inhibits infection) to each tube. Take 1 c.c. of patient's serum free from contamination and hemolysis for each of the 4 tests. Prepare 2 c.c. of 1 in 10 dilution for To and Ao tests and 2 c.c. of 1 in 5 dilution of serum for Vi and Rv tests. Of this add 1 c.c. of 1 in 10 serum into each of the first tubes of To and Ao rows. Mix well by sucking and transfer 1 c.c. to the second tube and so on except for the seventh in which no diluted serum is added but kept as control. Thus the dilutions in the first six tubes of To and Ao rows are 1 in 20, 40, 80, 160, 320, and 640. Repeat for Vi and Rv rows with 1 in 5 dilution serum so that the resulting dilutions are 1 in 10, 20, 40, 80, 160, and 320. Add to each row one drop of the appropriate fresh, concentrated suspension of the antigen. Shake thoroughly and incubate at 37°C for 2 hours and then keep it at room temperature for 12-24 hours. Then read the control tube (7) first, which should show a distinct agglomeration of organisms into a circular central mass. In estimating titres in the other tubes look for (1) complete dispersal of the deposit; (2) clearing of the supernatant fluid.

To titre may rise to 1 in 160 in recently inoculated persons but after

6 months the titre falls. A titre value of 1 in 320 or above is suggestive of enteric, as also a *rise in To* titre in successive tests. To agglutinins rise in response to paratyphoid infection and Ao will respond to typhoid infection. Ao titres tend to be lower than To titres. Of Vi and Rv the latter is more sensitive. These two agglutinins are not present in the sera of healthy persons, whether inoculated or not, and a titre of 1 in 20 is rare in them. These do not appear in any condition other than enteric. A titre value above 1 in 20 is definitely diagnostic even in the inoculated.

3. *Other Auxiliary Tests*.—(a) *Marris' Atropine test* depends on the fact that in health or in diseases other than enteric, Atropine Sulph 1/33 grain s. c. increases the pulse rate by at least 30 per minute and that in enteric the increase is never above 12. So ask the patient to lie horizontally at absolute and perfect mental rest; after 15 minutes count the pulse rate for 5 minutes so as to eliminate excitement. Then inject 1/33 grain Atropine s. c. and after an interval of ½ hour count the pulse minute by minute till the rate is steady. Note the increase in pulse rate. This test is positive only between 5th and 14th day of the fever. This test must be done only an hour after the meal. (b) *Blood smear* shows leucopenia with relative lymphocytosis. (c) *Urine*. Ehrlich's diazo reaction done by adding to urine a conc. solution of Sulphanilic acid in Hcl. and Sod. Nitrite shows a pink colour when positive. But this is positive also in malaria and eruptive fevers. Thus it is of importance only when it is negative.

III. *Differential diagnosis*.—There are a number of fevers that simulate enteric during the earlier phase.

1. Fevers with slow pulse: (1) *Influenza* especially abdominal type. (2) *Dengue* but this is of short duration. (3) *Typhus*. Difficult to distinguish this from enteric except by Weil-Felix reaction. Also there is neither marked slowness of pulse nor leucopenia. The rash comes on the 5th day of fever, appears all over the body and does not fade on pressure. (4) *Trench fever*. (5) *Sand fly fever*, but this lasts only for 7 days. Other fevers that must be differentiated are: (6) *M. T. Malaria* especially cerebral or abdominal types. (7) *Septicaemias* especially those due to *B. Facalis* *alkaligenes* or *B. coli*. (8) *Food or ptomaine poisoning* by bacilli of *Salmonella* group; in this however the fever is of very short duration and there is predominance of gastro-intestinal symptoms. (9) *B. coli* infections of urinary tract such as pyelitis. (10) *Incipient phthisis*. (11) *Acute miliary tuberculosis*. (12) *Tuberculous meningitis* especially in cases of enteric with meningism. (13) *Kala Azar* in early stages but the bone marrow smear distinguishes it. (14) *Undulant or Malta fever*. (15) *Relapsing fever*. (16) *Broncho pneumonia*. (17) *Subclinical amoebic hepatitis*. (18) *Rarely visceral syphilis* (secondary stage).

Studies in Gastric Analysis on South Indians*

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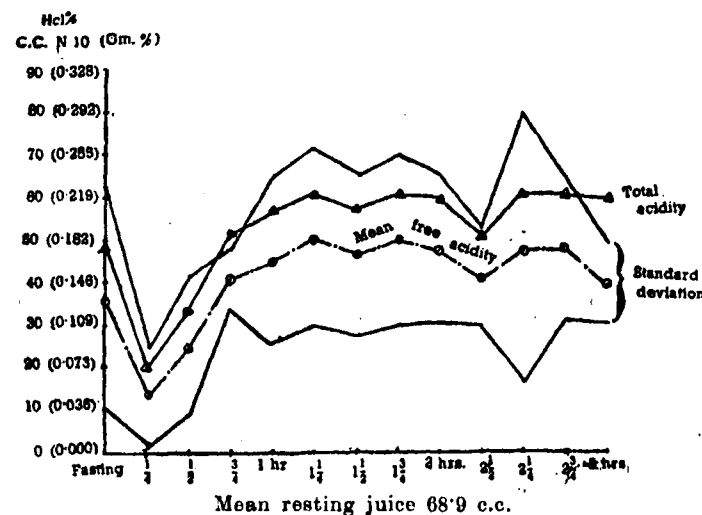
PART II.

Pathological Cases—(ii) Ulcers, and other cases of interest.

PREVIOUS publications of this series (VARIYAR and MANNADI NAYAR 1944; VARIYAR, CRUICKSHANK and MANNADI NAYAR 1944) dealt with the gastric acidity in normal South Indians and in some pathological cases. This paper gives the results of observations in subjects suffering from duodenal ulcer, ulcer with attendant complications (stenosis and appendicitis), appendicitis and anastomotic ulcer. Fifteen studies on individual cases of special pathological interest are also included. The experimental technique was the same as in previous studies.

I. **Group cases.**—*Duodenal ulcer*:—Twenty-eight subjects whose ages ranged from 20 to 55 years (average 31.9 years) were examined. The average duration of the complaint was 5 years, and the average value of the fasting contents 68.9 c.c. Mean total acidity, mean free acidity and standard deviation of free acidity in this group are shown in Chart No. 1.

CHART NO. 1
DUODENAL ULCER CASES.



Acidity variation in 26 out of the 28 cases are not statistically significant. Of the remaining two cases, the observed acidity values were outside the range (Mean $\pm$ 2 s.d.) by 1 c.c. in 3 samples in the first case, and in 2 samples in the second. As such slight variation can statistically be expected in 5%

of the cases, the acidity variation in duodenal ulcer cases can be considered to be of the same order as in normal subjects.

2. *Duodenal ulcer with pyloric stenosis*:—Twenty-one patients were examined under this group. The average age was 37.2 years. The duration of their illness varied from 2 to 20 years and the volume of the resting

* Specially contributed to 'The Antiseptic.'

† Part of the thesis "Gastric Analysis on South Indians" which formed the basis of the award of the Degree of Master of Science in the University of Madras in 1941.

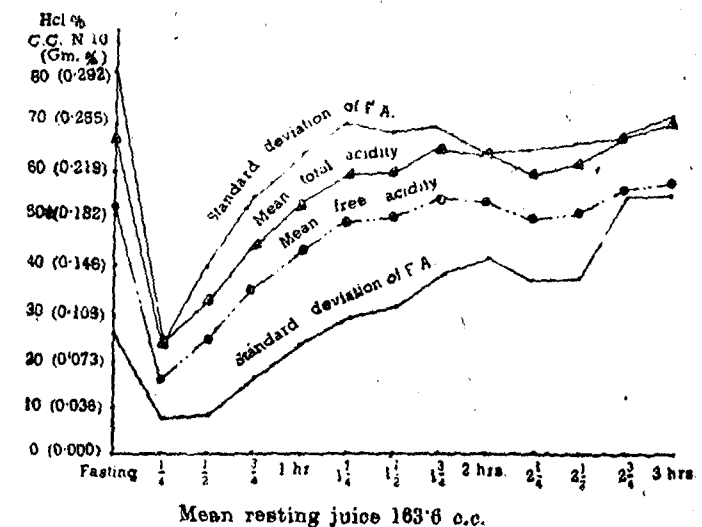
juice from 20 c.c. to 820 c.c. The average duration was 5.5 years and the average volume of the fasting contents 163 c.c.

Chart No. 2 contains curves of mean free acidity, mean total acidity and standard deviation of the free acidity values found in the series.

As the variation in 20 cases was within the range (Mean $\pm$ 2 s.d.) and the single remaining case fell within the 5% probability limit it may be concluded that only normal acidity variations occur in this condition.

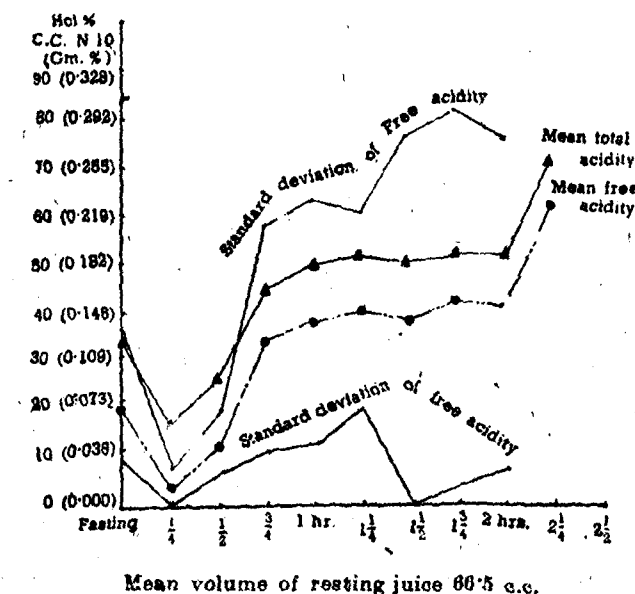
3. *Duodenal ulcer and appendicitis*:—The average age of the five

CHART NO. 2
DUODENAL ULCER WITH PYLORIC STENOSIS OR OBSTRUCTION.



patients examined was 33.6 years, the average duration of their illness 4.8 years and the average volume of the fasting stomach contents 66.5 c.c.

CHART NO. 3
DUODENAL ULCER AND APPENDICITIS.



The mean acidity values together with limits of normal variations of free acidity values are given in Chart No. 3.

All the values fall within the limits, "Mean $\pm$ 2 s.d." and therefore the variation in the acidity values is not significant.

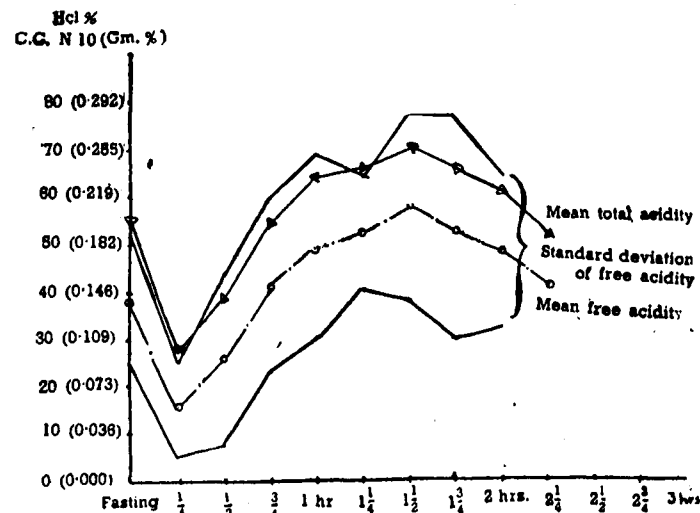
4. *Duodenal ulcer with stenosis and appendicitis*:—This combination was encountered in four cases. Their average age was 30.5 years, and the average duration of illness 3.7 years.

Curves for mean and total acidity values and for standard deviation values of free acidities are given in Chart No. 4. (Vide page 10.)

Even under this condition no significant acidity variation occurs.

5. *Appendicitis*:—The average age of five persons examined was 34

CHART NO. 4
DUODENAL ULCER WITH PYLORIC STENOSIS AND APPENDICITIS.



years, average duration of their illness 4.6 years and the average volume of the fasting contents 43.7 c.c.

Curves for mean free acidity, mean total acidity and standard deviation are given in *Chart No. 5*.

The values did not exceed their mean value $\pm$ twice the standard

deviation and so no significance need be attached to the variation in values.

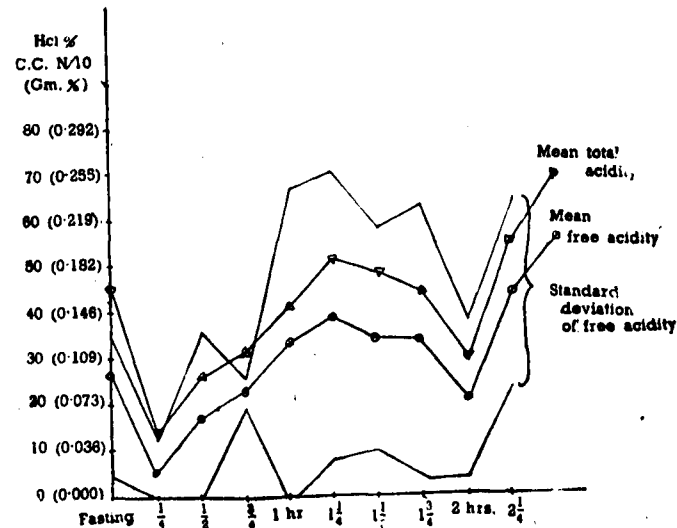
The diagnostic value of test-meal in appendicitis cases has been questioned by RYLE (1926); he was, however, of opinion that the results of

these are more likely to be found in hyperchlorhydria and achlorhydria groups than the normal ones. In his studies of chronic appendicular diseases with dyspepsia, BONAR (cited by RYLE, 1926) encountered achlorhydria and hypochlorhydria in 55%, normal acidity in 15% and high acidity in the

remaining 30% of the cases. In appendicitis cases without dyspepsia, 12% had normal acidity and 88%, hyperacidity.

In this study, out of the 5 cases of chronic appendicitis without any attendant complications, 3 cases (60%) came under the high normal group, while one each (20%) belonged to hyper and hypochlorhydria groups.

CHART NO. 5
CHRONIC APPENDICITIS.

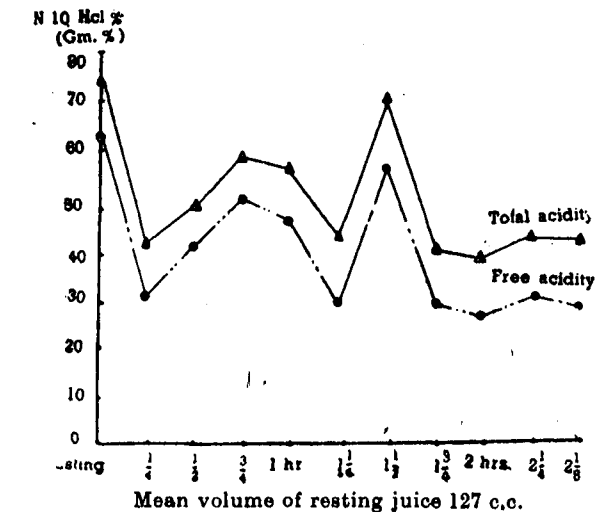


Taking into consideration all the cases in which appendicitis occurred (cases with and without attendant complications) 7 out of 15 (i.e., 46.7%) showed hyperchlorhydria, 6 (40%) high normal acidity and one each (6.7%) normal acidity and hypo-acidity. It will be seen therefore that while all acidity types are met with, the greatest frequency distribution falls in the high normal and hyper acidity range.

6. *Anastomotic ulcer*:—Two cases were examined. The average age was 27.5 years, average duration of illness 1.1 years and the average volume of the fasting stomach contents 127 c.c.

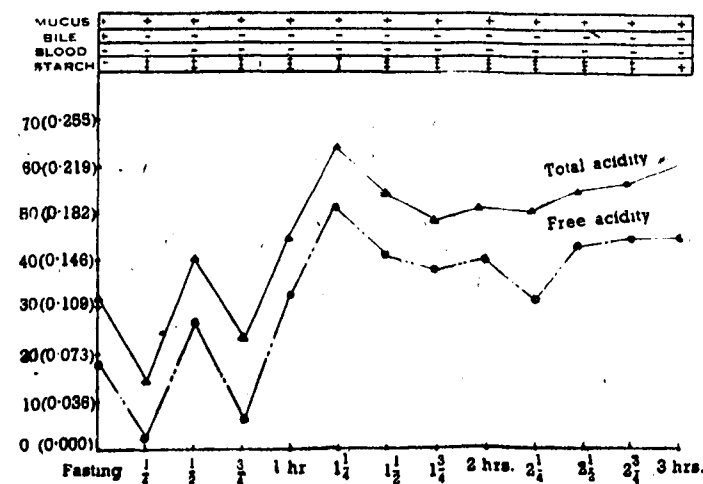
It will be seen from *Chart No. 6* that the hyperchlorhydric curve shows three maxima values, one prior to administration of the test-meal, another $\frac{1}{2}$ hour after ingestion and third after $1\frac{1}{2}$ hours. Examination of further cases is necessary to draw definite conclusions on the occurrence of hyperchlorhydria and fluctuation in acidity values in this disease.

CHART NO. 6
ANASTOMOTIC ULCER.



II. *Individual cases*.—1. *Gastric ulcer*:—The patient was 30 years

CHART NO. 7
GASTRIC ULCER.



R. J. 108 c.c. No retention. 30 cc. at the end of 3 hrs. Ulcer of about 1" dia. high up on the lesser curvature. Was adherent to the pancreas posteriorly.

Pathologist reported that the case was suggestive of chronic gastric ulcer showing no evidence of malignancy.

The result of the gastric analysis of this case is given in *Chart No. 7*.

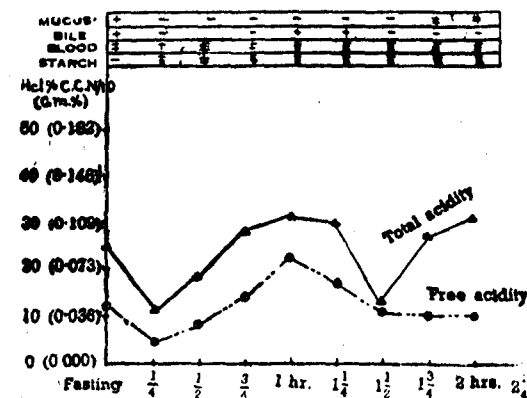
old and he had epigastric pain 3 years just previous to his admission—discomfort which had definite relation to food. Radiologist's report was the presence of ulcer crater on the lesser curvature of the stomach. On operation ulcer of one inch diameter was seen high up in the lesser curvature adhering to the pancreas posteriorly. Pa-

The following points on the test-meal report are note-worthy:—

The stomach showed delayed emptying. At the end of 2½ hours the specimens showed signs of emptying and the sample taken at the end of 3 hours contained only traces of starch. No sample contained either free or occult blood. Bile was present only in the resting juice and the sample taken just after 2¼ hours. All samples contained mucus. The free acidity values varied from 2.90 c.c. (in the sample taken ¼ hour after the administration of the meal) to 49.9 (in the specimen taken at the end of 1½ hours). Total acidity varied from 14.25 c.c. to 62.65 c.c. N/10 HCl. In three samples the values for combined acidity and acid salts were above 15 c.c. N/10 HCl. In the resting juice it had the value of 16.57 c.c., in the sample taken after ¾ hour, 15.90 c.c., and in that taken after 2¼ hours, 17.85 c.c. These specimens were viscous and probably contained exudations from the ulcer lesions.

2. *Gastric ulcer with a healed duodenal ulcer on the first part of the*

CHART NO. 8
GASTRIC ULCER WITH HEALED DUODENAL ULCER.



R. J. 15 c.c. No retention. Healed ulcer on the 1st part of the duodenum and a big hard, indurated ulcer on the lesser curvature of the stomach towards the cardiac end producing an "hour-glass constriction." Pancreas, liver, gall-bladder and spleen normal.

The gastric acidity was normal. There was free acid in all the samples and the maximum acidity was seen at 1 hour after the administration of the 'Meal' when it reached the value of 22.5 c.c. The emptying time of the stomach was normal, but all the specimens contained plenty of blood. Bile was present in the resting juice and the specimens collected just after 1 hour and 1¼ hours. Mucus was present only in traces in the resting juice, but in fairly good amounts in the last two specimens. Difference between the free and total acidities was 21.6 c.c. in the last specimen.

3. *Gastric ulcer and pyloric stenosis*:—This patient was 25 years old and the duration of his illness, 3 years. After thorough examination it was diagnosed that he was suffering from gastric ulcer and pyloric stenosis.

Chart No. 9 (vide page 13) represents the results of the gastric analysis

duodenum:—This patient was 40 years old and had a history of gastric pain extending to 4 years. Picture taken after an opaque meal showed a big ulcer crater on the lesser curvature and an hour-glass constriction of the stomach. Operation revealed a healed ulcer on the first part of the duodenum and a big, hard indurated ulcer on the lesser curvature of the stomach at the cardiac end producing "hour-glass constriction."

The test-meal analysis is reported in Chart No. 8.

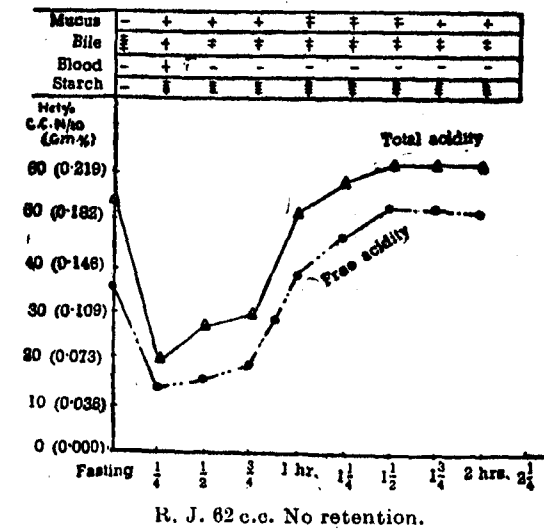
The following details are noteworthy:—

The following details are important:—

All the specimens except the resting juice contained mucus. There was plenty of bile in the samples. Blood was absent throughout. Resting juice did not contain starch, but all the other specimens did. The acidity curve was typically of a "climbing type."

4. *Duodenal ulcer with hypermotility*:—This patient was 23 years old and his complaint was of 3 years' duration.

CHART NO. 9
GASTRIC ULCER WITH PYLORIC STENOSIS.



R. J. 62 c.c. No retention.

CHART NO. 10
DUODENAL ULCER WITH RAPID EMPTYING.

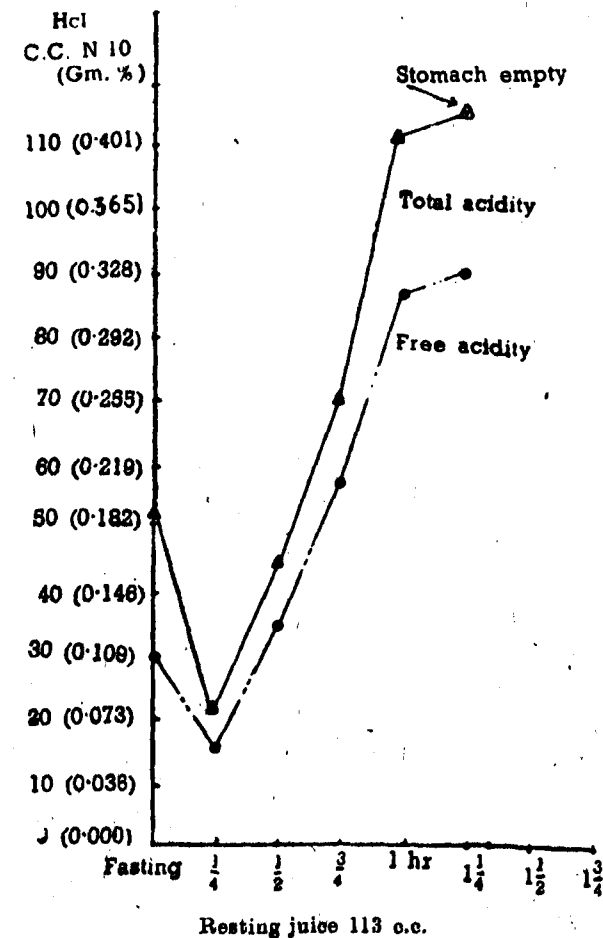


Chart No. 10 gives a picture of gastric acidity in the case.

The following were the salient points in the test-meal report:—

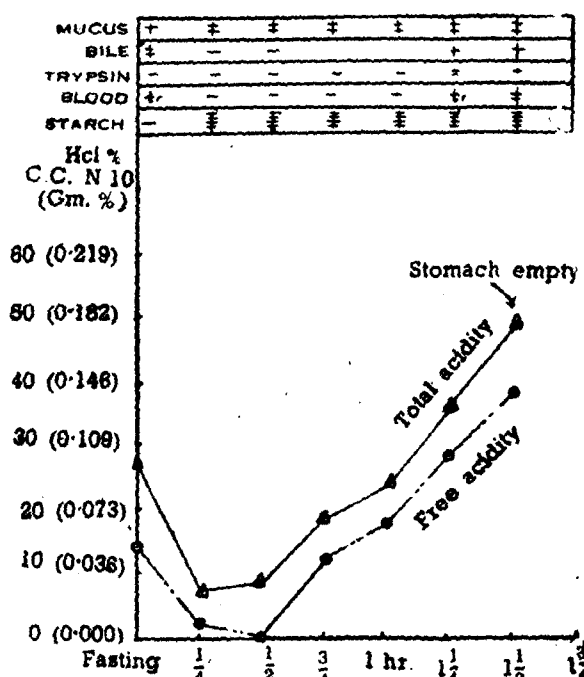
(1) In the fasting stomach contents the concentration of the free acid was 30 c.c. N/10 HCl (0.109 gm. per 100 c.c.) and its volume, 113 c.c. The sample contained traces of mucus, trypsin, plenty of bile and definite amounts of blood. But starch was completely absent. Difference between the free and total acidity values was 21.40 c.c.

(2) The curve belonged to the rapidly climbing type. The maximum free acidity was 89.60 c.c. and the maximum total acidity, 114.60 c.c. These values were reached in 1¼ hours.

- (3) The stomach emptied itself rapidly and at a time when the acidity reached its maximum value.
- (4) Definite amounts of blood were present in all the samples which contained bile suggesting the possibility of ulceration in the duodenum.
- (5) Free acidity curve closely followed the total acidity curve except in the resting juice and in the sample collected at the end of $1\frac{1}{4}$ hours.

5. *Pylorospasm*:—The patient was 35 years old and the duration of his illness, 5 years.

CHART NO. 11
PYLOROSPASM.



Resting juice 39 c.c. No ulcer was found either in the stomach or duodenum.

- (5) Blood and trypsin were closely following bile. However, trypsin was absent in the resting juice.
- (6) The stomach emptied itself at a time when the gastric acidity was at its maximum.

One fact about this case deserves special attention. There were traces of blood in all the samples in which bile was present and the inference, one is likely to draw, is that blood came from the ulcers of the duodenum. But, on operation, no ulcer was found either in the stomach or in the duodenum. Naturally, therefore, the bleeding might have been due to the trauma caused by the tip of the RYLE's tube in gastric mucosa. So, while interpreting the results of a test-meal the fact that the benzidine test is sensitive enough to detect even the smallest trace of blood, that there is a possibility of the blood coming from the trauma caused by the gastric tube and that mere traces of blood should never be taken as a

The results of fractional test-meal analysis are given in Chart No. 11.

The following points are important:—

- (1) There is no food retention and the stomach emptied itself in $1\frac{1}{2}$ hours.
- (2) The type of curve is the one usually seen in cases of duodenal ulcer with rapid emptying.
- (3) The volume of the resting juice and its free acidity value are low.
- (4) Mucus was present in all the samples, but in fairly good amounts in the latter ones.

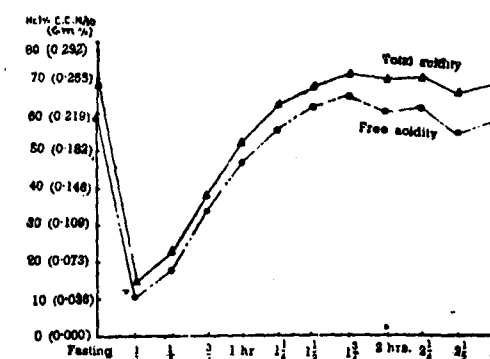
positive sign for the presence of active ulcers either in the stomach or in the duodenum, must be clearly borne in mind.

6. *Juxta-pyloric ulceration*:—Chart No. 12 indicates the shapes of the acidity curves.

The following points about the results of analysis of the gastric contents deserve attention:—

- (1) The volume of the resting juice was 60 c.c. There was bile in the specimen but the sample did not look abnormal. There was no food residue. Blood and lactic acid were absent.
- (2) The case belonged to one of stenosis type since there was delayed emptying. After $2\frac{1}{2}$ hours had elapsed 43 c.c. of the contents could be collected. This sample contained plenty of starch.
- (3) All the samples were perfectly clear. Mucus was practically absent in all the samples.

CHART NO. 12
DUODENAL ULCER NEAR THE PYLORUS.



R. J. 60 c.c. No retention. Lactic acid absent. 43 c.c. of stomach fluid could be obtained after $2\frac{1}{2}$ hrs. Ulcer on the anterior aspect of the 1st part of the duodenum near the pylorus.

- (4) All the specimens after 2 hours contained definite amounts of blood showing the possibility of the presence of an active ulcer.
- (5) The acidity values were slowly climbing up. At 2 hours and $2\frac{1}{2}$ hours there was slight lowering of acidities.

This is a typical case of juxta-pyloric ulceration. The acidity values climb up because of the organic lesion present at the pylorus which produces definite degree of stenosis. In this case the maximum acidity is in $1\frac{1}{2}$ hours sample but really the acidity would have gone

up if neutralization by the duodenal contents (presence of bile and trypsin in the samples and its higher total chloride value indicate this) had not taken place.

7. *Duodenal ulcer with marked stenosis*:—The patient was 47 years old and the duration of his illness, 5 years.

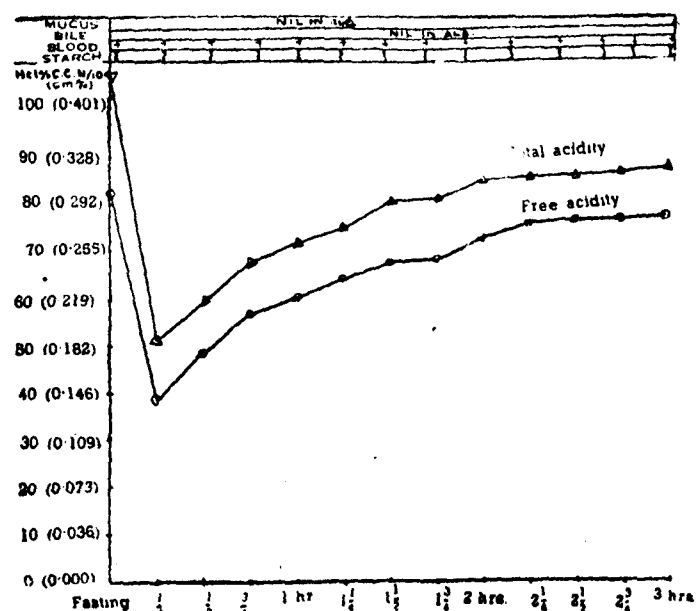
Chart No. 13 (vide page 16) is a graphic representation of the test-meal analysis on this patient.

The following points are important in the test-meal results:—

The volume of the resting juice was 650 c.c. Mucus and bile were absent in the samples. All the specimens contained small quantities of blood and plenty of starch. Maximum free acidity and total acidity were in the resting juice. Free acidity reached the minimum value $\frac{1}{4}$ hour after the administration of the test-meal and then it steadily went on increasing till it reached the value of 67.80 c.c., the 2nd highest point in the chart. This figure was reached at the end of 3 hours.

On operation the stomach was found to be much dilated. An ulcer of the size of a lime with marked induration was found on the first part of the duode-

CHART NO. 13
DUODENAL ULCER WITH PYLORIC STENOSIS ("PLATEAU" TYPE)



Volume of R. J. 650 cc. Stomach much dilated. Ulcer of the size of lime, with marked induration on the 1st part of the duodenum. Pyloric stenosis.

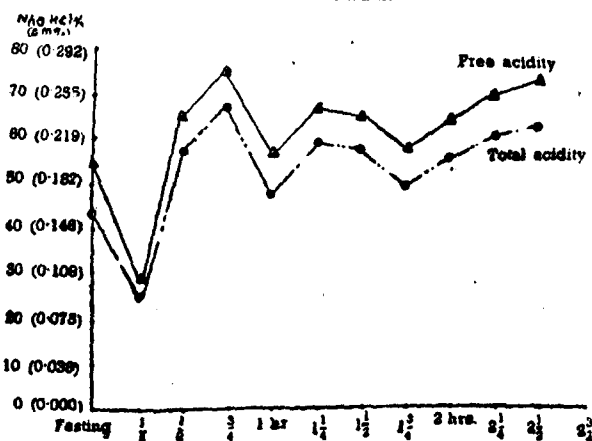
hesions to the liver and gall-bladder:—Chart No. 14 gives the acidity

curves in a case of duodenal ulcer with adhesions to the liver and gall-bladder met with in the series.

• The volume of the resting juice was 170 c.c. and this specimen contained plenty of bile. Acute abdominal pain started at the end of one hour after the administration of the test-meal and the patient was unwilling to submit himself till completion of the test. The gastro tube was therefore taken out at the

end of 2½ hours. Depressions in the acid curve are seen at ½ hour, 1 hour,

CHART NO. 14
DUODENAL ULCER WITH ADHESIONS TO LIVER
GALL-BLADDER.



Volume of R. J. 170 c.c. Stomach was not empty at the end of 2½ hrs. Stomach drawn up and adherent to liver on its anterior aspect. Indurated ulcer on the first part of the duodenum.

of the duode-nium, and stenosis at the pylorus.

This is really a case of "hyperacidity" and "hypersecretion"—"hyperacidity" because the maximum free acidity goes over 60 c.c. N/10 HCl per 100 c.c. of gastric contents and "hypersecretion" because the high value is reached quickly and is maintained.

8. Duodenal ulcer with ad-

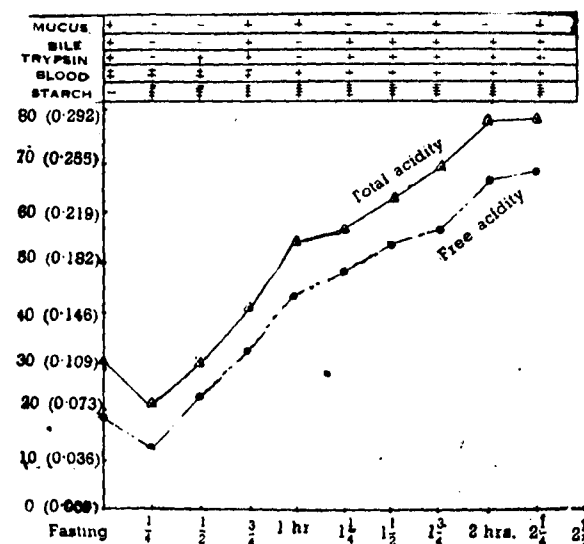
1½ hours, and 1¾ hours after administering the meal. Estimation of total chlorides also gave depressed values at ¼ hour, 1 hour and 1¾ hours showing thereby that only smaller quantities of juice were secreted at 1 hour and 1¾ hours. In the quarter-hour-sample, the decrease in the value was mainly due to dilution.

9. Duodenal ulcer with healing appendicitis:—

The patient was 40 years old, and the duration of his illness, 3 years. On operation a circular ulcer was noticed obstructing the pylorus. The pathologist reported that there was also healing appendicitis.

The test-meal results of this case are given in Chart No. 15.

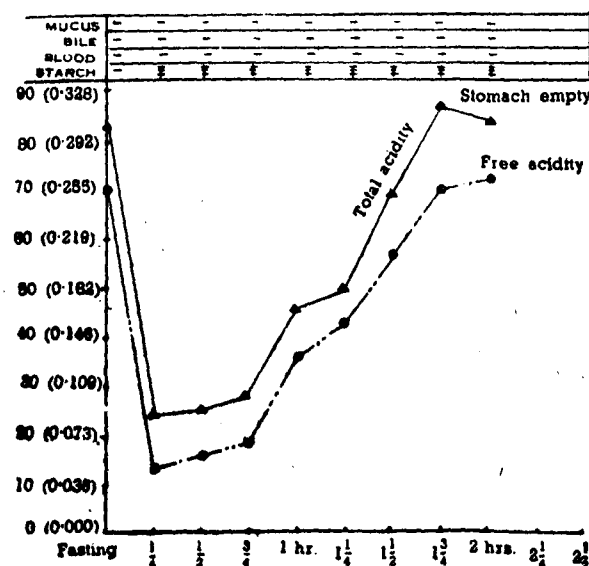
CHART NO. 15.
PYLORIC ULCER WITH HEALING APPENDICITIS.



Volume R. J. 47 c.c. A circular ulcer obstructing the pylorus healing appendicitis.

The following points in the chart are noteworthy:—

CHART NO. 16.
DUODENAL ULCER AND CHRONIC APPENDICITIS
WITH RUPTURE AND PERITONITIS.



An ulcer in the duodenum with little induration. No evidence of stasis but the whole peritoneum showed evidence of recent inflammation.

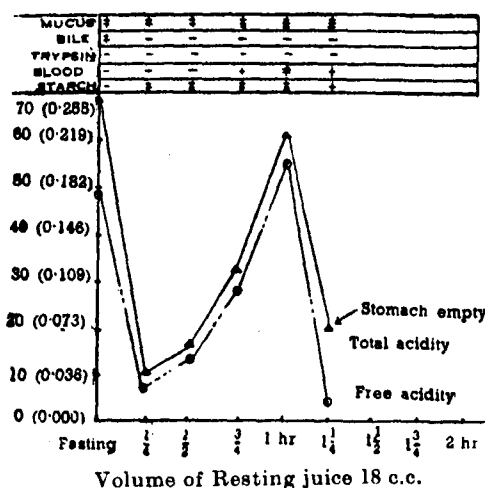
The curve is of the climbing type. Resting juice contained only 18.55 c.c. of free acid, but the latter reached the high figure of 69.05 c.c. in 2½ hours. Blood was present in all the specimens while mucus, bile and trypsin were present only in certain specimens. Resting juice did not contain starch and the stomach was emptied in 2½ hours.

10. Duodenal ulcer, appendicitis and peritonitis—This patient was 25 years old and the duration of his illness, 2 years. On opening the abdomen an ulcer with little induration was noticed in the duodenum. There was no evidence of pyloric stenosis but the whole perito-

neum showed evidence of recent inflammation. Appendix was highly inflamed

and it contained mucoid material. Chart No. 16 (see page 17) represents the report of the test-meal performed on the patient.

CHART NO. 17
PYELITIS.



The chart looks like that of a duodenal ulcer, but as blood is absent in all the samples the report does not positively indicate ulceration.

11. *Pyelitis*:—This is the only female patient in the series. The patient was 20 years old when she was admitted for gastric pain and the duration of her complaint was 5 years. This was a clear case of pyelitis, but as it was admitted for gastric complaint and as the fractional test-meal curve was slightly different from the normal type it is reported here with curve.

Chart No. 17 represents the results of the gastric analysis.

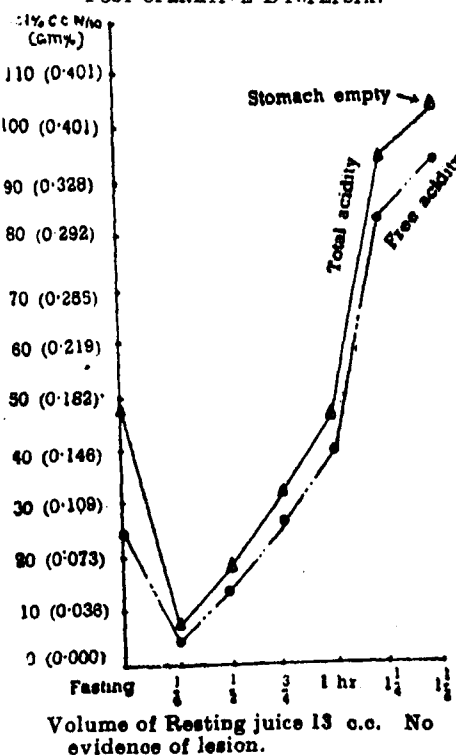
The following are the noteworthy points in the chart —

The free acidity of the resting juice was 49.05 c.c. It went down to 7.10 c.c. in $\frac{1}{2}$ hour and then slowly mounted up to 55.66 c.c. which value was reached in one hour. In the sample taken after $1\frac{1}{2}$ hours there was a sudden fall and the free acidity value became 4.90 c.c. The stomach was completely empty in $1\frac{1}{2}$ hrs. Mucus was present in fairly large amounts in all the specimens but blood was present only in the last three specimens.

12. *Post-operative dyspepsia*:—The patient was about 45 years old and he had been operated on for duodenal ulcer about 4 years ago. The present complaint had 3 months' duration. A thorough examination including picture after opaque meal failed to show any evidence of lesion.

A graphic representation of the acidity values is given in Chart No. 18.

CHART NO. 18
POST-OPERATIVE DYSPEPSIA.



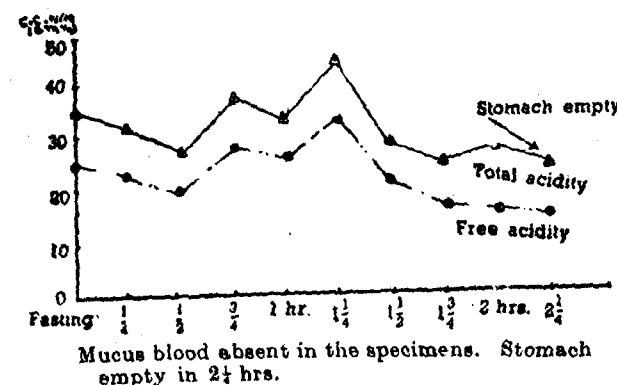
The following are the salient points in the test-meal results:—

The free acidity of the fasting contents was 49.05 c.c. It went down to 7.10 c.c. in $\frac{1}{2}$ hour and then slowly mounted up to 55.66 c.c. which value was reached in one hour. In the sample taken after $1\frac{1}{2}$ hours there was a sudden fall and the free acidity value became 4.90 c.c. The stomach was completely empty in $1\frac{1}{2}$ hours. Mucus was

present in fairly large amounts in all the specimens but blood was present only in the last three specimens.

13. *Recurrent ulcer of the jejunum*:—The patient was 23 years old and the present complaint started 4 months prior to his admission into the hospital. He had been operated on for duodenal ulcer and pyloric stenosis 4 years before. Gastroscopy and barium-meal report indicated

CHART NO. 19
RECURRENT ULCER OF THE JEJUNUM.



that the stoma of the gastro-jejunostomy was considerably narrowed and that ulcer was present.

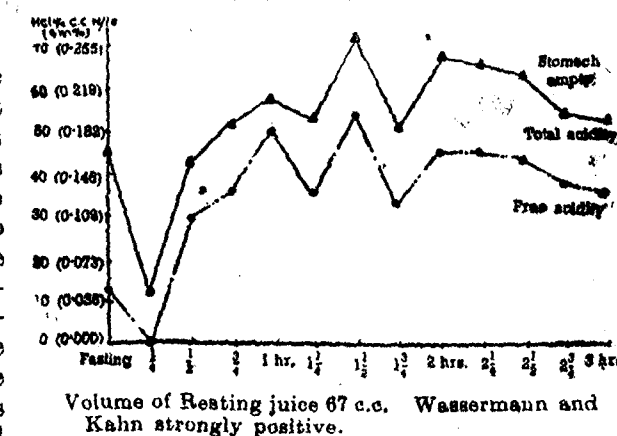
Chart No. 19 gives the acid concentration in the gastric samples.

Most of the acid values fall within normal limits.

14. *Gastric syphilis*:—There was only one case of gastric syphilis in the present series. The patient was 55 years old and the duration of his illness 3 months, before which he had no gastric trouble. After the onset of the attack the patient complained of gastric trouble throughout the day, i.e., the pain had no relation to food. The blood examination revealed that both Wasserman and Kahn tests were strongly positive. The gastroscopical report was that the stomach was full

of fluid and nothing could be seen. The patient was screened and the report was that nothing abnormal could be detected. However, after barium meal the radiologist reported that there was uniformly curved filling-defect at the pyloric end of the small curvature and that the stomach was one-third full in the picture taken after 3 hours the fractional test-meal report on Chart No. 20 represents this case.

CHART NO. 20
GASTRIC SYPHILIS.



The following points in the f.t.m. report are noteworthy:—

The volume of the resting juice was 67 c.c., and lactic acid was present in the sample. The first two specimens looked normal while the specimens taken after those were brown. The volume of the gastric contents could be withdrawn after 3 hours was 45 c.c.

REHFUSS (1927) has reported that STOKES and BROWN had investigated fractional test meal done on 122 syphilitic patients with gastric trouble and had found hypoacidity in 61 cases or 50 per cent., that WILE had found hypoacidity in 62 per cent. of such cases and that EUSTERMAN was inclined to believe that generally low acidity was found in cases of gastric syphilis. In REHFUSS' personal experience (1927) gastric analysis showed a marked reduction in the secretory out-put with or without pus or blood. In one case where there was a large deforming gummatous lesion he found anacidity and presence of blood in all gastric samples. He therefore concluded that generally the acidity would be much less in syphilitic cases but also suggested the possibility of occasionally finding hyperacidity. He further opined that high acidities were usually encountered in the localised ulcerous type and low acidity in diffuse gummatous and infiltrating type. He also said that the X-ray pictures in almost all cases showed a filling defect which might be marked in certain cases. SMITHIES found persistent twelve-hour retention in 8 out of 35 cases, i.e., in 22 per cent. of the total number of cases examined. Hydrochloric acid was absent in 5 cases only. The average free HCl for the group was 29.4 and maximum acidity, 110. The mean total acidity was 41.4 c.c. N/10 HCl per 100 c.c. of the gastric contents while the maximum total acidity was 114 c.c. N/10 HCl, per 100 c.c. Pyloric stenosis with palpable epigastric nodule was observed in that particular case. The total of combined HCl and acid salts averaged 10.2 c.c.; the minimum was zero and maximum, 36 c.c. The presence of lactic acid was found in three cases (i.e., in 11 per cent. of the cases). Altered blood was present in the gastric contents of 9 cases, i.e., 28.8 per cent. of the cases. SMITHIES said that neither fluoroscope nor plate methods would return pathognomonic signs while the Roentgen-method might ocularly demonstrate deformities in gastric contour.

The case in question agrees very well with the observations of the previous workers stated above. The free HCl figures show that the case belongs to the high acidity type. The minimum difference between the free and total acids is 8 c.c. N/10 HCl per 100 c.c. of the gastric contents and is found in the sample taken at the end of one hour, and the maximum, 32.50 c.c. found in the fasting stomach contents. These values fall within the range mentioned by SMITHIES, viz., 0 c.c. and 36 c.c. N/10 HCl per cent. For all samples except two, values for the combined acids and acid salts were above 15 c.c. N/10 HCl per cent. Occult blood was present in large quantities in all the samples. It is quite likely that the high free acid values are due to pyloric stenosis and the case being not advanced so far as to produce hypoacidity or complete anacidity.

15. *Cancer of the stomach*:—There was only one proved case. The patient was 32 years old and he gave a four months' history of epigastric discomfort unrelated to food. Radiological examination suggested malignant growth. On operation growth was seen at the pyloric end of the stomach, and the specimens removed therefrom showed carcinomatous infiltration of the stomach.

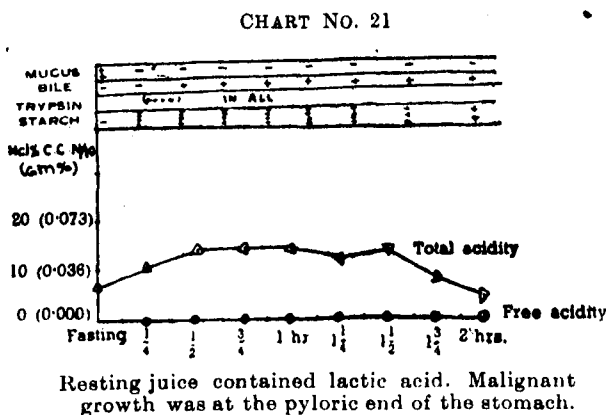
Chart No. 21 is the report on the gastric analysis.

The following points in the chart are noteworthy:—

There was absolutely no free acidity. The stomach emptied in 2 hours' time and thereby showed that emptying time was normal. A little mucus was present in the resting juice. Specimens removed after $\frac{1}{2}$ hr. showed presence of bile. The total acidity was in no case more than 14.25 c.c.—a value not different from that usually seen in anæmia or achylia gastrica cases. Lactic acid was present in the resting juice and all the samples contained definite amounts of blood.

This case is comparable with the case cited by DR. BENNETT (1925) in which though the volume of the resting juice was only 15 c.c. traces of charcoal taken the previous night indicated stagnation. Specimens removed before, 1 hr. after and $1\frac{1}{2}$ hrs. after the administration of the test-meal contained blood. Resting juice had "definite amounts of blood both free and 'coffee ground'." Free acidity was completely absent in the samples taken out and the total acidity was low. The fact that the total acidity of the resting juice was 18, which was definitely higher than what was

usually seen in benign achylia gastrica together with the traces of charcoal made him conclude that stagnation was definitely present. This, when taken together with the fact that there was also the gastric hæmorrhage enabled him to diagnose it definitely as carcinoma of the stomach.



In the present case the total acidity of the resting juice was much less than that in the case cited above. In other respects the two cases seem to be alike. It is likely that the charcoal test would have been positive in this case also, for the presence of lactic acid shows stagnation. However, emptying time was normal. Now, normal emptying time is opposed to stagnation of food in the stomach. However, the two things can exist together thus: The pylorus is not so much impaired by the growth as to prevent it from functioning properly so that the oatmeal and even major part of the normal food leaves the stomach in normal time. But the pockets which are usually present on such growth can retain some small portions of food and therefore the effects of stagnation can be seen in this region. When the fasting stomach is emptied before administering the meal the specimen contains portions of fluid coming from this region also and hence shows evidence of stagnation. DR. BENNETT said that from his long personal experience he could say that free HCl was secreted by the stomach of patients suffering from carcinoma of the stomach and that even in cases where free acidity was completely absent the picture of gastric analysis was rarely identical with "benign" achylia gastrica. As there was only one proved case of carcinoma of the stomach in the present series it is not possible to enter into any discussion. It is very

likely that the case was too far advanced to have any free HCl secretion and that if the analysis had been performed earlier the gastric picture might have been totally different.

Summary.—The results of observations on patients suffering from duodenal ulcer, duodenal ulcer with attendant complications, appendicitis and anastomotic ulcer are given with curves. The acidity variations in these cases are not statistically significant.

2. Certain individual cases of special pathological interest, viz., Gastric ulcer, gastric ulcer with complications, duodenal ulcer, duodenal ulcer with complications, pylorospasm, pyelitis, post-operative dyspepsia, recurrent ulcer of the jejunum, gastric syphilis and cancer of the stomach are recorded with acidity curves.

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2. M. C. Variyar, M. M. Cruickshank and A. S. Mannadi Nayar (1944)—*Antiseptic*.
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5. T. I. Bennett (1925)—*"Stomach and Upper Alimentary Canal in Health and Disease,"* Heinemann, London.

Indian Village Obstetric Emergencies

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(Continued from page 710 of Dec. 1944 issue).

Chapter XVI.

Operations on the Cervix and on the Perineal Body

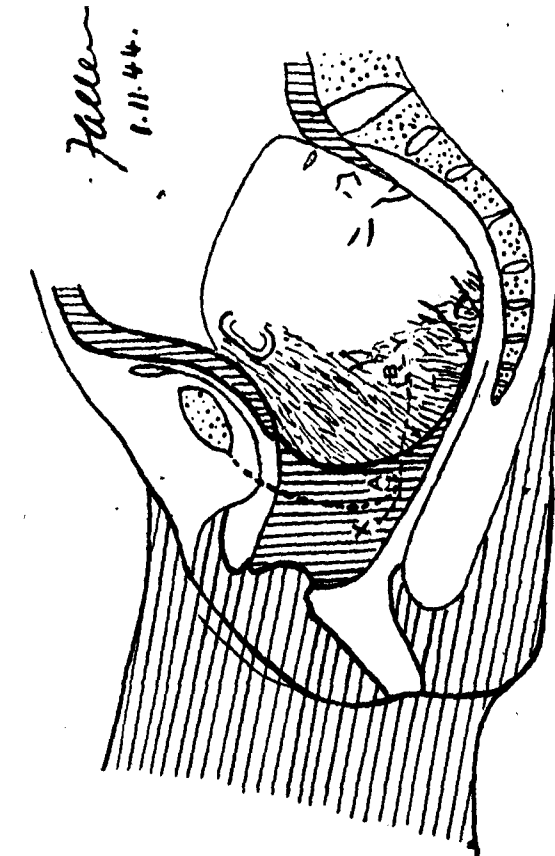
1. **Local infiltration anaesthesia.**—1. Local anaesthesia is ideal for the low forceps operation, for the repair of the lacerated perineal body and vagina and for the performance of episiotomy. If the patient is morphinised it is of great assistance but Morphine given immediately prior to the low forceps operation is liable to lead to severe apnoea in the infant on delivery.

2. Use Novocaine 1% solution with Adrenalin or Ephedrin or Percaine-Adrenalin 0.1% solution from sterile ampoules. Novutox 2% in 2 oz. rubber capped bottles is safe since Novutox solution is self sterilising but stings more than Novocaine.

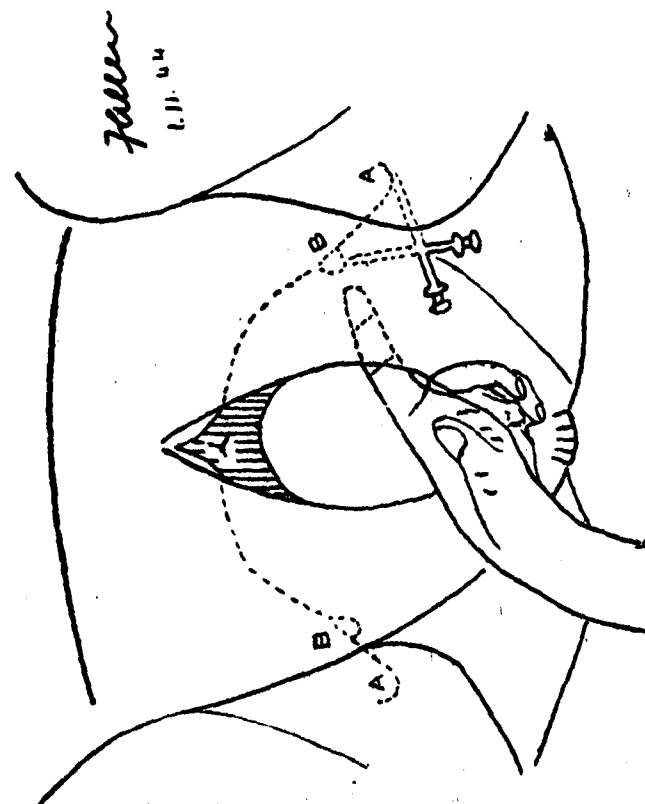
3. Before injecting any solution the piston of the syringe must always be pulled upon and if any blood is withdrawn it shows that the needle point is in a blood vessel. The position of the point must be changed until blood cannot be drawn into the syringe barrel.

4. **Pudendal nerve block:**—Fill an ordinary 20 cc. syringe with the solution and attach a 5 in. long 20 gauge needle. Introduce the point of the needle about $\frac{1}{2}$ inch (1 cm.) medial to the ischial tuberosity. With a finger in the vagina to guide the needle point under the mucosa, advance the needle point about 4 in (10 cm.) along the postero-lateral aspect of the vagina to the region of the ischial spine, which the finger in the vagina should endeavour to locate. Pull on the piston of the syringe. If

BLOCKING THE PUDENDAL NERVE



(2) Section.



(1) Plan.

A—Ischial Tuberosity.
B—Ischial Spine.
X-Y—Course of Pudendal Nerve.

blood is sucked into the barrel it shows that the point of the needle lies in a blood vessel and the position of the point must be altered slightly until no more blood can be sucked into the syringe. Inject 15 cc. of the solution so that it is deposited in the region of the ischial spine. One can rarely palpate the ischial spine, but this will put the anæsthetic in proximity to the pudendal nerve, which is all that is desired. Disconnect the syringe from the needle, refill the syringe. Withdraw the point of the needle to the subcutaneous tissue and then plunge the point down until it hits the ischial tuberosity. Back off the point of the needle and pass it just medial to and slightly posterior to the tuberosity. Pull on the piston to see if the needle point is free of a blood vessel. If necessary free it and then inject 10 cc. of the solution thus again blocking the pudendal nerve.

Repeat the whole of the above procedure on the opposite side. Only two needle punctures are made in the skin. The four points where the procaine solution must be deposited, namely, the 2 ischial spines and the 2 tuberosities of the ischium are reached from the 2 points of cutaneous puncture. It is most important to wait five minutes while the anæsthetic solution infiltrates the nerve sheaths. Many of the failures with local anæsthesia are the result of impatience. This five minutes interval is used for opening the sutures, threading the needle and catheterizing the bladder or for articulating the forceps and visualising how they will be applied and the various other steps of the proposed operation.

If on testing by needle or other pricks for anæsthesia after five minutes along the line of the proposed episiotomy incision the above infiltration is found to be insufficient :

5. *Local infiltration for episiotomy* :—Fill a 20 cc. syringe and enter the point of the needle in the midline at the centre of the fourchette. Inject 0.5 c.c. of anæsthetic solution into the muco-cutaneous junction. If your syringe is only of 10 cc. or 5 cc. capacity it will do but it must be refilled as soon as it is empty without withdrawing the needle. Proceed to pass the point of the needle postero-laterally immediately under the skin injecting the Novocaine solution as the needle advances along the line of your intended incision using about 10 cc. of the solution. Withdraw the needle point until it is very nearly but not quite back at its place of introduction. Now pass the point postero-laterally immediately under the vaginal mucous membrane injecting 10 cc. of solution in the line of your intended incision. Refill the syringe without withdrawing the needle. Withdraw the needle point until it is nearly disengaged from its place of introduction and advance it along under the skin first medially and then laterally to the original line of infiltration while injecting 5 cc. of the solution along each track. Repeat this procedure first medially and then laterally to the original vaginal line of infiltration again injecting 5 cc. along each new track.

Refill the syringe without withdrawing the needle.

Make several passes with the point of the needle into the muscles and fascia between the lines of skin infiltration and the lines of mucous membrane infiltration injecting the solution as the needle advances for each pass.

When the muscles have been infiltrated withdraw the needle completely.

Wait at least 5 minutes for the anaesthetic to take effect.

Messrs. Ciba supply ampoules of 5.5 cm. and 30.5 cm. of Percaine-Adrenalin 1 in 1,000 solution for infiltration anæsthesia.

6. *Local infiltration for suture of the perineum* :—If the injection is done with care and the method here described followed in detail, the operator may be confident of success. In any case, a gentle preliminary test with a pair of pressure forceps on the supposedly insensitive skin is sufficient to show whether the infiltration has been satisfactorily performed. In general, the amount of anæsthetic required varies from 20 to 40 c.c. with an average of 30 c.c. Always test whether the point of the needle has penetrated a blood vessel before injecting the solution from the syringe.

Fill a large syringe (20 c.c.) with anæsthetic solution. If Novocaine 1% or Percaine 0.1% is selected, the solution must be taken from freshly opened ampoules and not from rubber capped or ordinary bottles, since the risk of contamination is too great. A fairly long needle of medium bore is required. Novutox 2%, being self sterilizing, may be used from 2 oz. rubber capped bottles.

If care is taken in the injection, the patient will probably feel nothing, at the most only two pricks. The solution must never be injected through undamaged skin, but only from a torn surface outward underneath the skin. Accordingly, the first injection is made at the posterior end of the tear starting on one or the other side. Advance the point of the needle outward under the skin from the side of the tear. The injection should be as superficial as possible, and, as it is made, the skin should be seen to whiten. Withdraw the needle point slightly and then again advance it much deeper, so that the solution is now put deep in the perineal body. Withdraw the point of the needle somewhat again, advance and direct it forward, almost parallel with the cut surface, and infiltrate into the area forward of the first injection point. Withdraw the point of the needle completely and commence a new injection into the torn surface $\frac{1}{2}$ – $\frac{3}{4}$ in. in front of the first point. Repeat the same three movements. Continue to make injections with three similar passes until the upper end of the tear is reached (often high up the vagina), and then deal with the opposite side of the tear in the same way. It is obvious that the third movement of forward injection infiltrates the area immediately ahead. The needle penetrates each successive time through an already anæsthetised area, and the patient does not feel it.

It is important to see that the superficial part of the injection is only just underneath the skin of the perineum or the mucous membrane of the vagina, as the case may be, otherwise the patient will feel the suturing needles as they are introduced and drawn out.

II. *Episiotomy*.—Episiotomy is rarely necessary because the perineal bodies of Indian peasant women are usually beautifully elastic.

1. The indications for episiotomy may be maternal, that is to save a tear of the perineal body, or foetal, in order to avoid intracranial injuries, or mixed as when more room is required for the performance of some intra-vaginal or intra-uterine manipulation.

2. A medio-lateral incision may be made diagonally from the middle of the fourchette in a dorso-lateral direction to the right or to the left. A medio-lateral episiotomy is slightly more difficult to repair than a medial episiotomy but there is no risk of the wound extending to involve the sphincter ani.

3. If the patient is not under a general anæsthetic one may, with advantage, employ pudendal nerve block or infiltrate the skin, the mucous membrane and perineal body with local anæsthetic.

4. The timing of an episiotomy must be a matter of careful judgment. The incision must be made after the head reaches the pelvic floor when some stretching has occurred but before any damage has been caused. It is wrong to wait until crowning is marked and tearing of the muscle fibres has probably taken place. Yet it must not be made too early or an unnecessary quantity of blood will be lost.

5. When other obstetric operations are contemplated, after the vulval opening and the vagina have been ironed out as described in Chapter III, 17 if there is still insufficient room for the necessary manipulations owing to a tight vulval ring, the episiotomy must be performed in order to permit of the other manœuvres being effected.

If however there is sufficient room it is better to wait until the forceps have been applied etc., and the head has had time to stretch the perineum to some extent before making the incision in order to avoid unnecessary loss of blood.

6. Use a very sharp, straight, round ended pair of scissors.

7. Place the cutting angle of the blades of the scissors on the median raphe in the centre of the fourchette, one blade must be on the vaginal mucous membrane and the other must be on the skin. A finger and thumb must keep the sphincter ani pressed away from the bite of the scissors. Cut dorsally at an angle of 20° from the "A.P." line joining the fourchette to the anus. Pressure from a cloth wrung out in hot, weak antiseptic will control any bleeding.

8. For repair of the episiotomy wound use the technique described for repairing tears of the perineum. (V below).

III. Digital dilatation of the external "os."—1. This is a very dangerous operation because even with the greatest gentleness and patience it may result in serious tears of the cervix even extending to the lower segment of the uterus. It must never be attempted in a case of placenta prævia.

2. The method described in Chapter XV (III) is safer but slower provided the situation permits.

3. Prepare the patient as described in Chapter I, 11, 12, 13 and 14 and Chapter III, 17.

4. When the cervix is completely taken up and the external "os" will admit a finger and thumb the external "os" may be stretched until another finger and finally in succession all the fingers can be introduced and opened out. It is less dangerous if the "os" externum is four fingers dilated before the operation commences.

5. If the cervix and external "os" are low in the vagina it is sometimes preferable to introduce first one index finger and then the other index finger. When these two fingers have gently stretched the external "os" first one and then the other middle fingers are introduced thus forming a cone. Careful gentle stretching is continued until first one thumb or ring finger can be introduced followed by the thumb or ring finger of the other hand.

6. In one of these ways the external "os" is dilated until it can be pushed back over the presenting part or until it appears to have reached the diameter of the presenting part if forceps are to be applied.

IV. Incisions in the external "os."—Like digital dilatation, the field of usefulness for this operation is strictly limited.

The incisions are safe only after complete and full dilatation and refacement of the cervix. Placenta prævia is an absolute contra-indication.

(Most digital dilatations of the external "os" are in reality bilateral tears).

Prepare the patient and yourself in the usual way. A good light and a broad posterior speculum are essential. Where available the requirements for repairing the cervix should be prepared although it is better to leave the incisions to be repaired in a hospital after the puerperium if you doubt your ability. Expose the external "os" by wide retraction, posteriorly and bilaterally, of the vagina.

Suppose that 12 o'clock is directly under the patient's urethral orifice and 6 o'clock is directly above the anus, incisions will be required at 1-30, at 4-30, at 7-30, and at 10-30 o'clock.

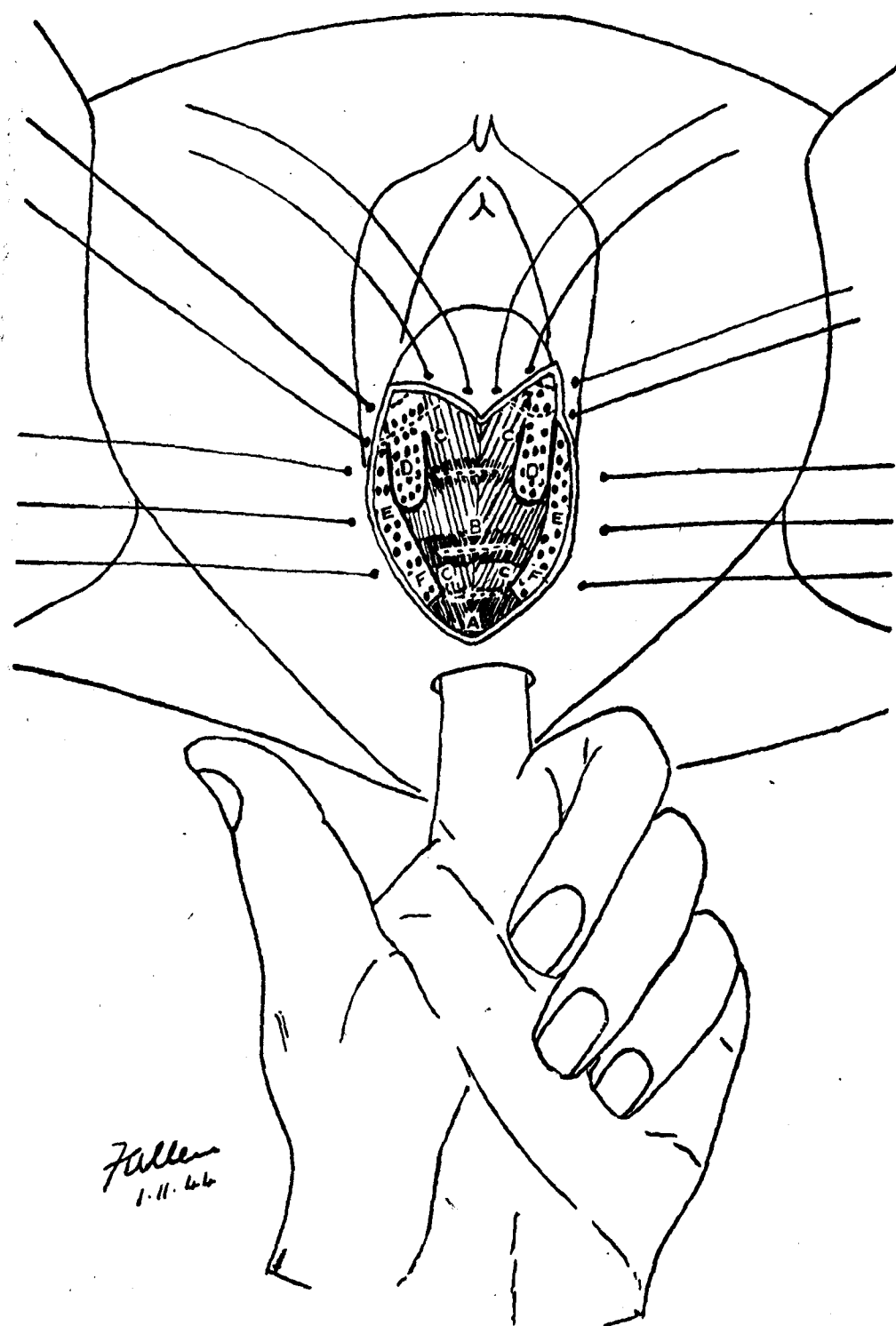
Grasp the external "os" on each side of your proposed first incision in the jaws of two hæmostats and with a sharp pair of scissors make a cut almost up to the vault of the fornix. Leave the hæmostats in position for a minute or two to reduce hæmorrhage and then repeat the procedure at the sites for the other incisions. Where you do not possess hæmostats you will have to make the incisions without their aid.

In the subsequent extraction of the child exert the greatest care and deliberation in order to try and prevent the incisions tearing further laterally.

Where there is bleeding after delivery and you are unable to repair the cervix plug the wounds with sterile gauze or cloth for 24 hours leaving a sterile rubber or other tube drain through and between the plugs whereby the lochia may escape. This drain should be of the widest tubing you possess. [See VI below].

V. Repair of tears of the perineal body and of episiotomy incisions.—1. *Special requirements:*—(a) Large half circle needles such as The Rotunda Hospital pattern or Bonney's (Down Bros. Catalogue No's 278/9 and 931/5). These large needles are used for those sutures which are introduced through the skin and owing to their size a needle holder is not necessary. If only smaller needles are available then a needle holder is required though in the absence of a needle holder hæmostat forceps may be used. It is handy to have three of these needles though the job can be done with one. A most convenient needle for the general practitioners is the full curved hollow needle with a flat finger grip at one end, as made to the design of Dr. J. S. LAURIE by Messrs. C. P. Thackray, Park Street, Leeds, England. One such needle is sufficient but it is always advisable to have one or two spare needles ready sterilized in reserve.

The needle point must be kept as sharp as the point of a new serum needle by touching it up on an Arkansas stone, which every medical man should possess for touching up all his needles and knives. [See 2. Maxims (b) below.]



A—Sphincter Ani. B—Muscle of Rectal Wall. C—Levatores Ani.
 D—Deep Transverse Perinei in Triangular Ligament.
 E—Bulbo Cavernosus (Sphincter Vaginae). F—Superficial Transverse Perinei.

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E 6

(b) $\frac{3}{4}$ circle fine needles about $\frac{3}{4}$ to 1 inch (2 to 2.5 cm.) in diameter for repair of the mucous surfaces. It is advantageous to possess at least three of such needles. Tidy's hollow curved needles (Down Bros., 21, St. Thomas's Street, London S.E.-1, Catalogue No. 280/14) are handy especially for small tears at the vaginal outlet. I prefer to use fine horse hair with these needles. When ordering Tidy's needles specify that half circle are required. (The makers supply packets containing 6 needles of 3 sizes). [See 2. Maxims: (b) below].

(c) At least six strands of the stoutest available silk-worm gut. Each strand should be 12 inches long.

(d) One or two pairs of sterile gloves. If gloves are not available then a sterilised stout rubber stomach tube or enema nozzle of vulcanite or preferably of rubber will be required.

(e) Two pairs of Allis' or other tissue forceps.

(f) One or two tubes of sterile No. 1 or No. 2 Chromic, ultra-tan or 40 day catgut made by a firm of repute. (This is important for fear of causing tetanus).

NOTE that in an emergency stout white, black or khaki cotton sewing thread may be employed for the sutures.

2. *Maxims*:—(a) Every tear of the perineal body requires repair. Occasionally it is not advisable to carry out the repair immediately after labour because the woman is too collapsed or too exhausted, because there is commencing infection, because the parts are so battered and bruised that necrosis is feared, or because there is an old laceration which will require extensive dissection before a satisfactory repair can be effected.

A clean case which is merely too shocked or collapsed for immediate repair should have the operation performed about 24 hours after delivery when she has rallied.

Any other case must be sent to hospital in about eight months' time for thorough operative treatment. Failure to do this may result in the woman being abandoned by her husband.

The repair of a complete laceration of the perineal body involving the sphincter ani and the rectal wall requires considerable technical skill. It can be carried out in the home provided the operator is intelligent and is meticulously careful. Beware of a small tear of the fourchet or even a severe stretching of the vaginal outlet masking an underlying disruption of the muscles. Careful examination with a finger in the rectum will reveal this pitfall.

(b) Anæsthesia is not necessary if only one or two superficial sutures are required but beware of overlooking deeper disruptions which will lead to subsequent prolapse. An almost painless introduction of sutures, in the absence of local or general anæsthesia, may be obtained by the use of hollow needles. (My own scalp was stitched without an anæsthetic, so I have some slight knowledge on the subject of painless introduction of sutures. I was glad that I had previously introduced Tidy's hollow needles into the hospital practice.)

A hollow needle is either threaded upto but not beyond the point before introduction, or else it is threaded after introduction. The point of the needle is introduced and made to traverse the layers and depths of the

wound, just like the point of any other suture needle. When the point emerges at the opposite lip of the wound one end of the suture material is pushed through the bore from the base and the leading tip withdrawn from the needle point for a sufficient distance. When a satisfactory hold has been obtained on the leading end of the suture the needle is withdrawn like a

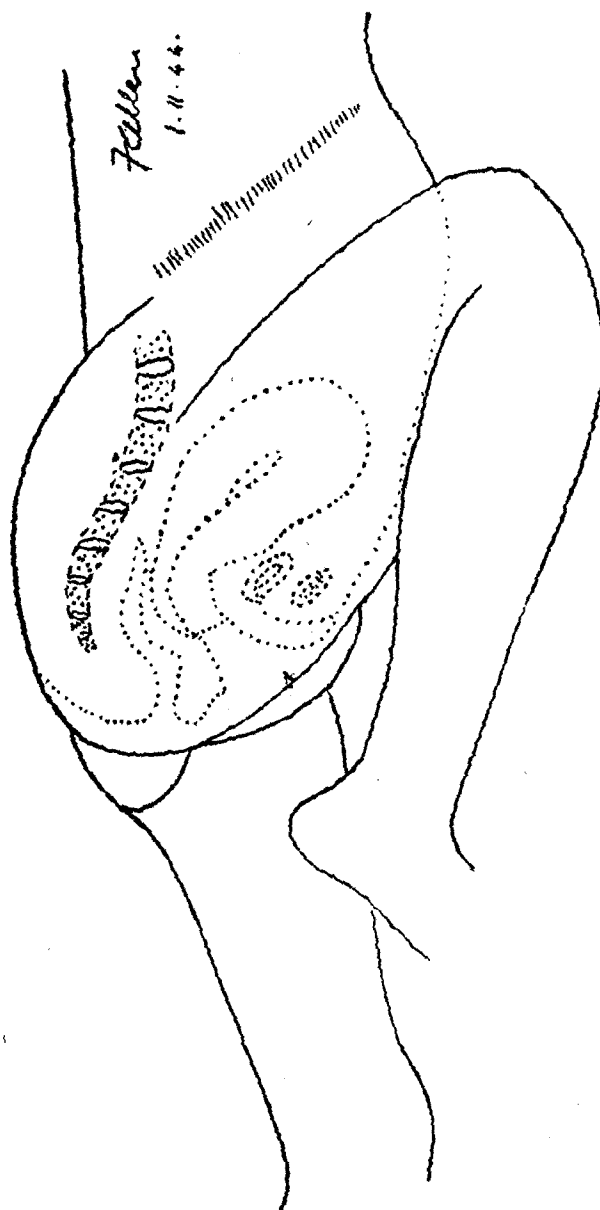
hypodermic or intramuscular or intravenous needle, along its track of introduction, leaving the suture material in position. When the needle has cleared the base of the suture material the stitch is tied off exactly like any other stitch.

Hollow needles may be threaded with any suture material which is sufficiently small to fit the bore of the needle. It is of paramount importance to clean the bore of hollow needles by means of a stylet or a bristle after use to avoid the bore becoming choked. It is also important to keep the points touched upon an Arkansas stone but this applies equally to all needles and knives.

(c) It is not necessary to await delivery of the placenta before commencing to repair the perineum unless there is a likelihood of "P.P.H."

(d) In order to keep the blood and other discharges as much as possible away from the field of operation place the woman in the left lateral posture or in Sims' posture. If in the left lateral posture the patient's buttocks must be drawn to the edge of the bed or over a small cushion pillow or roll of cloth so that her buttocks are on a higher level than her

LEFT SIMS' POSTURE



The Genital tract is shown as it would be on about the third day of the puerperium.

knees. A sterile plug of cloth may be pushed up the vagina to dam back the blood but *beware* of forgetting to withdraw it.

(e) A good light is essential. If the day light is not sufficient then artificial light must be obtained. The ideal would be a head light for the operator but this is rarely available.

(f) No. 1 ultra-tan, chronic or 40 day catgut may be used throughout but stout 12 in. long strands of silk worm gut are to be preferred for safety. It is difficult to cut the knots off, and remove the S.W. gut sutures from the rectum, and not easy to do so from the vagina. It is therefore permissible to use catgut when working on the mucous membranes, provided there is absolute asepsis, but S.W. gut should be chosen for all sutures inserted on the skin surface.

(g) Always use interrupted stitches and place each suture not more than $\frac{1}{2}$ inch away from its neighbour.

(h) On the mucous membranes the insertion of each stitch should not be more than about $\frac{1}{2}$ inch from the margin of the wound in order to avoid an undue narrowing of the lumen of the bowel or vagina.

On the skin surface a good bite of at least $\frac{1}{4}$ to $\frac{1}{2}$ inch 1 cm. is ideal

The bite must widen as the point of the needle penetrates deeper into the layers of tissue, which compose the lips of the wound. When the needle point has reached the level of the floor of the wound it must be brought across the floor or just deep to the floor and be made to penetrate to an equal extent and to an identical depth in the opposite lip of the wound before it is brought out through all the layers.

(i) The knots must only be tied sufficiently tight to draw together the entire depth of the disrupted layers of the injured part. If the knot are tied under tension the sutures will cut out and the repair will not be successful.

(j) The ends of the S. W. gut sutures must not be cut after being tied off. They must be left long. Finally before the pad is applied the loose ends must be collected together and tied in a loose loop which must be wrapped in a small piece of sterile cloth.

(k) As many sutures as are necessary to effect good co-option must be used. It is better to insert too many sutures than too few.

(l) The perineal body is triangular in shape. If the perineal body is to be repaired satisfactorily this fibro-muscular triangle must be restored to its proper shape and consistency, muscle to muscle, fascia to fascia. The base of the triangle, which is about $1\frac{1}{2}$ inches (4 cm.) long is covered by skin and is situated on the surface of the body. The apex of the triangle lies at a depth of about $1\frac{1}{2}$ inches (4 cm.) in the pelvis at the point where the lower angulation of the rectum meets the vagina.

The shape of the perineal body is maintained by muscles enclosed in their sheaths and embedded in fibro-fatty connective tissue.

The dorsal tension of the posterior angle of the perineal body is maintained by the external sphincter ani muscle. Anterior tension in the region of the fourchette is maintained by the sphincter vaginal muscle whose anatomical name is the bulbo-cavernosus. Between the above two muscles stretches the median raphe into which are inserted from each side the ensheathed superficial and deep transverse perineal muscles.

Deep to the sphincter ani and superficial transverse perineal muscles lie portions of the levatores ani. From their origins on the posterior aspect of the pubes and from the white line these fibres run back on each side to intermingle with the longitudinal fibres of the muscle in the vaginal wall in the lower third of the canal, with the longitudinal muscle fibres of the rectal wall and with both sphincter and muscles thus forming the sling which holds the pelvic contents in position.

The apex of the triangle of the perineal body is formed by the junction of the muscles of posterior vaginal wall and of the muscles of the anterior wall of the rectum.

It is very important that the point of entry of each suture and the point of exit of each suture should be made exactly opposite each other. Failure to do so will result in uneven repair of the wound and in puckering up of the skin edges with resultant tags and painful lumps in the patient's perineum. Further more the muscles and fascia cannot unite satisfactorily if not accurately opposed.

(m) When the perineal body is to be repaired, in order to enable the point of the needle to pick up the outer longitudinal muscle fibres of the rectum without penetrating the lumen, it is most desirable either to introduce a finger through the anus for a distance of about three inches or to pass in the tip of a stiff stomach tube or other piece of rubber or vulcanite before the repair is commenced and to keep it there during the operation.

If one waits until all the sutures have been tied before inserting a finger into the rectum one often finds that one has to cut out the most important suture because it is traversing the lumen of the bowel and the whole operation or a large part of it must be done all over again.

3. *The Operation*:—Ensure that the needles are loaded and all instruments ready to hand.

(a) If the tear is deep and involves the wall of the rectum as well as the sphincter ani muscle the rectal tear must be repaired first.

It is essential that all the sutures be inserted from, and all the knots be tied in the cavity of, the rectum commencing with the deepest, or, to be more accurate the most proximal.

Each suture must pick up the mucous membrane, the submucous tissues and the muscle itself of the rectal wall, which has retracted with in the two leaves of its sheath, before passing across the bed of the wound to pick up the layers of the opposite margin of the wound in the reverse order.

When the mucocutaneous junction of the anal margin has been brought together the two retracted ends of the external sphincter ani must be identified and drawn together by three sutures, one passing very deep, the others less deep and rather superficial. If possible one of the sutures at least should include the muscle sheath. This muscle is about half an inch in thickness and must be co-opted accurately in its entirety. The two torn edges of the external sphincter ani retract strongly and will only be found if search is made deep in the pocket of skin on each side of the laid open anal canal. To hold and draw them together while the sutures are being introduced, tissue forceps, such as Allis', are useful but vulsella or hæmostats will do if the others are not available.

(b) For the vagina and the perineal body apart from the sphincter

ani and rectal wall the operator will be well advised to perform his repair either with a finger or with a stout bougie in the rectum.

If the former method is employed both hands must be gloved and a second glove must be drawn over the glove which is already on the left hand. The left forefinger must be lubricated and inserted very gently through the anus of the patient to reach as far as possible. If sutures have already been placed in the rectal wall or sphincter ani this introduction of the finger must be made with extreme care. By flexing the left forefinger in the rectum the posterior vaginal wall is drawn down into full view.

In the second method a stout flatus tube, stomach tube or vulcanite dilator of about the same diameter as the forefinger is to be introduced through the anus for a distance of about four inches with even greater care than when the left forefinger is being used. By pressing back the base of the article introduced into the rectum the posterior vaginal wall can be drawn into view.

If a tear or tears is discovered in the walls of the vagina repair must be effected.

Introduce the point of a threaded needle through the mucous-membrane about $\frac{1}{4}$ inch from the torn margin and about $\frac{1}{4}$ inch from the highest point of the tear. Make the point of the needle pick up the underlying muscle wall of the vagina which is about $\frac{1}{4}$ inch in thickness. The point of the needle of this topmost suture must now pick up the muscle of the anterior wall of the rectum, which is lying in the bed of the wound, as high up the pelvis as possible, thus refixing the vagina to the rectum from which it has been avulsed.

After having secured the muscle of the rectal wall the point of the needle must now pass through the muscle of the vaginal wall on the opposite side of the tear and finally emerge through the vaginal mucous membrane $\frac{1}{4}$ inch from the margin of the tear opposite the original point of introduction. The left forefinger must be kept in the rectum, if it is there already, and the remaining fingers of the left hand must help the right hand to tie the suture just tight enough to bring the torn margins together without tension.

The second highest suture should also pick up the muscle of the rectal wall in the bed of the tear but the remaining stitches which must be inserted at intervals of $\frac{1}{4}$ inch must not include the rectal muscle.

Exactly the same procedure must be adopted for any other tear in the vagina.

(c) After the vagina has been repaired the perineal body remains to be dealt with or where the perineal body alone requires to be dealt with:—

Make the wound bulge downwards by gentle flexure of the finger in the rectum or by backward pressure on the stomach tube. Usually three sutures will be required.

Enter the point of the needle for the first suture slightly ventral to and $\frac{1}{4}$ to $\frac{1}{2}$ inch 1 cm. lateral to the dorsal margin of the wound. The point of the needle must be made to advance outwards taking thus a wider bite of the superficial transverse perineal muscle and an even wider bite of the underlying levator ani. When both of these muscles have been traversed the point of the needle must be brought across the bed of the wound within the substance of the longitudinal muscle covering the rectum and anus from

which the lavatores have been parted. When the opposite side is reached the point of the needle must pick up first a very wide bite of the levator ani, then a slightly less wide bite of the superficial transverse perineal muscle and finally about $\frac{1}{4}$ inch of skin. Two such sutures usually suffice for the lavatores ani and superficial transverse perineal muscles. The anterior of these two sutures must pass rather deeper than the posterior one.

The anterior (ventral) margin of the wound must now be closed in an exactly similar manner but the muscles to be penetrated as the needle point advances from the subcutaneous tissue are the bulbo-cavernosus (sphincter vaginal), the deep transverse perineal and the insertion of the levator ani into the outer longitudinal muscle of the vaginal wall.

(d) If there is any doubt about the satisfactory reconstitution of the sphincter vagina a fourth suture must be inserted in order to coapt carefully the posterior junction of the bulbo cavernosi muscles of each side. This repair of the bulbo cavernosi and of the underlying deep transverse perineal muscles within the triangular ligament is of great importance for the maintenance of married contentment.

Failure to effect perfect repair will have an adverse affect upon the sexual pleasure of both the patient and her husband. Even if the woman is a widow she has a right to a functioning sphincter for her vagina.

The finger or bougie must now be withdrawn from the rectum. The outer glove, if two are being worn, must be discarded. The gloved hands, if gloves are being worn, or the naked hands, if no gloves are available, must be washed thoroughly, using, if possible, a freshly boiled nailbrush with plenty of soap. The hands must then be steeped in strong disinfectant or "Dettol" obstetric cream or "Tropical Bleach Cream" well rubbed in.

With the finger tips press the two halves of the perineal body together and tie the sutures tight enough to hold the parts nicely together but *without any tension*.

If there is any tension the subsequent swelling of the parts will cause the sutures to cut out. A very slight amount of cutting out does not matter but there is always the danger of infection entering along the suture line where the material is cutting through the tissues.

If there is any gaping or pouting of the skin margins one or more superficial sutures must be introduced to approximate accurately the skin edges. Failure to do this is a common source of subsequent trouble and discomfort. Pay attention to the muco-cutaneous junctions and see that they are carefully co-apted.

Cut away any loose tags or semi-detached strips of skin or mucous membrane.

Very gently wipe away all blood with sterile cloths from the repaired area and when clean paint the line of sutures over with Tincture of Iodine.

Some people prefer a final cleansing with Ether and Ether is excellent but rather uncomfortable for the patient unless she is anaesthetised. *Do not cut off the ends of the sutures. Leave them full length and knot all the long ends together.*

(e) After the placenta has been expelled ensure by abdominal palpation that the uterus is well anteverted. If not, through the abdominal wall, sink the tips of the fingers or the ulnar border of a hand behind the

uterus from above and draw the uterus forward. Apply a binder to keep the uterus in anteversion.

If a dry sterile pad is available it may be applied, but not so tightly as to dam back faeces and discharges along the suture line, and be kept in position by a "T"-bandage. It is preferable to apply a sterile piece of gauze or cloth squeezed out in a 1 in a 1,000 neutral solution of some flavine in glycerine along the suture lines including the vaginal sutures but excluding those in the rectum or anal canal, if any. If flavine is not available use 1 part of finely powdered Sodium and Magnesium Sulphate in 4 parts of glycerine. If glycerine is not available finely powdered Urea or finely powdered Sodium or Magnesium Sulphate may be employed. Finally a sterile pad and "T" bandage must be applied over the above dressing.

The dressing and/or pad must be changed as often as soiled by lochia, urine or faeces. The lochia are the least dangerous and the faeces are the most dangerous contaminants apart from sepsis introduced at the time of operation or at each time of subsequent dressing.

4. *After care*:—After care is important to secure good union.

(a) The pad must be changed as often as it is soiled by lochia, urine or faeces. The pad must be sterile and applied loosely to avoid the danger being dammed back against the line of sutures.

(b) It is a wise precaution to bind the thighs together for one or two weeks according to the extent of the wound. Squatting for urination or of faeces defaecation must not be permitted for 3 or 4 weeks.

(c) The woman should lie prone on her abdomen when she passes urine. She should lie supine on her back when she defaecates.

(d) Most of the time for 3 weeks after the operation should be spent by the patient lying semi prone or prone. Cushions should be employed to keep her comfortably in position.

(e) Plenty of water is required by the patient. Her diet should be of the non-residue type such as milk, dhal, whey, biscuits, honey, ghee, ovaltine, juices only of fruits, etc.

(f) Some authorities like to give a little opium to bind the bowels but this is usually not necessary where the diet is carefully regulated. Opium must however be given for pain.

(g) After the seventh day medicinal paraffin or plenty of sweet oil should be given and before the bowels move the medical attendant should inject by means of a soft rubber catheter or similar tube 4 to 8 oz. of Bland oil into the rectum. The patient must be instructed not to strain when the bowels are moving.

(h) The sutures should be inspected daily by the operator who must wear a mask during the inspection and dressing.

(i) The dressing advised is 1 part of a neutral flavine in 1000 parts of glycerine. If a flavine is not available use 1 part of finely powdered Sodium or Magnesium Sulphate in 4 parts of glycerine. If glycerine is not available use finely powdered Urea, finely powdered Sodium or Magnesium Sulphate. Sometimes marked swelling yields quicker to sterile compress of boiled 10% aqueous solutions of Sodium or Magnesium Sulphate.

(j) Remove the stitches between the 10th and 14th days but if suppuration supervenes the stitches must be removed at once and the wound laid open and treated by finely powdered Urea or hot packs of 10% aqueous solution of Sodium or Magnesium Sulphate.

(k) Only the S. W. gut or thread sutures require to be removed. It is important that when removing a suture only *one side* should be cut near the knot and the suture withdrawn by traction on the knot. If a suture is cut on both sides of the knot a portion will be left in the tissues and may give rise to an abscess later.

(l) The patient is permitted to get out of bed 21 days after the removal of the sutures.

VI. Repair of tears of the cervix. — Unless there are signs of hæmorrhage or collapse it is not advisable to search for tears of the cervix which are luckily not very common among Indian peasant women.

If infection is either present or probable a tear of the cervix must not be sutured unless it bleeds and packing with sterile material or the application of ring forceps fails to control the hæmorrhage.

When bleeding is profuse it is a matter of great difficulty to effect a satisfactory repair until the source of the hæmorrhage can be controlled.

If the tear is deep and approaches or involves the lower uterine segment great care is required to avoid enclosing the ureter in the bite of a stitch or in the jaws of a ring forceps.

By means of ring or volsellum forceps on the anterior and posterior lips of the cervix the injured part must be drawn well down to where it will be accessible and the bleeding vessels brought into view.

To avoid a serious and possibly fatal hæmatoma the torn vessel must be encircled by a stitch or the ring of the forceps where packing has failed to control the bleeding or when it is decided to repair a tear straight away. It may even be necessary to introduce a finger into the cervix or lower segment, to pass the needle loaded with the suture material from inside the cavity round the bleeding vessel and bring the needle out again within the cavity. The knot must then be tied within the cavity of the cervix or uterus. If a ring forceps is used one jaw is placed inside the cavity and the other on the vaginal surface high in the fornix.

The sutures intended for repair of the rupture must be placed on the vaginal surface and the knots drawn rather tight before being tied because the cervix involutes rapidly.

It is advisable to use No 2 forty day (chronic or utraton) sterile catgut.

The needle should be $\frac{3}{4}$ circle and round pointed and about 1 inch diameter.

The muscle retracts between the two layers of the mucous membrane. Great care must be exercised to ensure that the muscle of both lips of the tear is seized in the bite of the suture.

Each stitch must pass through the vaginal mucous membrane, pick up the muscle of one lip of the tear, avoid the mucous membrane on the inside of the cavity, pick up the muscle of the other lip of the tear and emerge again through the vaginal mucous membrane.

Sufficient sutures must be introduced to effect a thorough and complete apposition of the torn margins. Each suture is to be placed about $\frac{1}{4}$ inch from its neighbour.

Vaginal douches must not be given.

If the wound becomes infected, if there is purulent vaginal discharge (not to be confused with normal lochia) or fever due to puerperal sepsis the stitches must be cut out immediately. Otherwise they are left to absorb.

(To be continued).

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Eye Troubles in Old Age—Causes*

DR. R. S. AGARWAL,
Eye Specialist, Delhi.

Normal function.—The eye is one of the sensory organs. Things are seen, just as they are felt, or heard, or tasted, without effort or volition on the part of the subject. The eye with normal sight never tries to see. What we see is mind's interpretation of the retinal images. The following illustration is very interesting:

"Take a Snellen test card and hold it at a distance from your eyes at which your sight is fairly good. Look at the white centre of the large letter. Suppose this large letter is 'O', compare the whiteness of the centre of the 'O' with the whiteness of the rest of the card. You may do it readily; but if not, use a screen, that is, a card with a small hole in it. With that card, cover over the black part of the letter 'O' and note the white centre of the letter which is exposed by the opening in the screen. Remove the screen and observe that there is a change in the appearance of the white, which appears to be a whiter white, when the black part of the letter is exposed. When the black part of the letter is covered with a screen, the centre of the 'O' is of the same whiteness as the rest of the card. It is, therefore, possible to demonstrate that you do not see the white centre of the 'O' whiter than the rest of the card, because you are seeing something that is not there. When you see something that is not there, you do not really see it, your mind only interprets or imagines it."

Strain.—When the mind is under strain, as usually happens in regarding unfamiliar objects, when there are sudden changes of light, noise, fear, worry, mental and physical discomforts, etc., and the eye makes stares or makes an effort to see, the normal functioning of the eye is affected and the interpretation of the retinal images by the mind is disturbed. The result is imperfect eyesight. The following experiment of strain on the chart is a good illustration:

"(a) Look at the notch of C on the Snellen test card from fifteen feet and fix the sight. Note that the blackness of the letter begins to blur. If the effort is increased, it becomes difficult to keep the eyes and mind fixed at one point, and one feels pain in the eyes and head.

(b) Then look at small letters and fix the sight. The letters become, blurred, and trying to see them blurs them more.

(c) Take the test card in the hand, note that C is clear. Now try to see the bottom and the top of the letter perfectly black at one time; note that C becomes blurred.

This shows that perfect sight comes easily, without effort or strain, while imperfect sight is always produced by a strain or an effort to see."

When the eye makes an effort to see, myopia is produced and the eyeball is lengthened. When the eye makes an effort to read or see at a near point, the eyeball is flattened and hypermetropia is produced. When the effort is such as to cause irregularity in the curvature of the eyeball, astigmatism is produced.

* Specially contributed to 'The Antiseptic.'

[87]

Eye movements.—The normal eye moves in various directions by the action of the outside muscles. Usually they make short, gentle and rapid movements unconsciously, and the movement is not conspicuous, but by direct examination with the ophthalmoscope it can always be demonstrated by noting the movements of the disc or blood vessels. When the eye is under strain, its movements become less, slow and jerky. By lessening the movements of the eyeball, the blood circulation of the eye is disturbed and the health of the eye suffers. When this condition becomes permanent, different forms of eye diseases, glaucoma, iritis, choroiditis, optic atrophy, retinitis, cataract, etc., occur. Whatever may be the form of the disease, if the patient is able to move his eyeballs in the normal way by doing certain eye exercises, the vision is benefited and the disease is partially or completely cured.

Central fixation.—The retina has a point of most acute vision. This point is called the macula lutea. When the eye looks at an object or a letter on the test card, it sees that object or letter best which it regards; other letters appear less distinct. This action of seeing the part regarded best is performed by the macula lutea, and is called central fixation. When the sight is normal the part seen best is extremely small. When the eye possesses central fixation, it functions without effort and can be used indefinitely without fatigue. By making an effort to see, the point of most acute vision—macula lutea—becomes less sensitive and the part of the letter or letter regarded is not seen best, and the central fixation is lost. When loss of central fixation is habitual, it leads to all sorts of abnormal conditions and is, in fact, at the bottom of most eye troubles, both functional and organic. The proof that the loss of central fixation is the underlying cause of all eye diseases, is that the patient seen begins to get the benefit as soon as he is able to use the eye by central fixation which can be taught by various central fixation eye exercises.

Interpretation or imagination.—When the mind is under strain, its power of interpretation or imagination is disturbed and the vision is affected. Imperfect imagination affects the health of the eye and mind, and by such imagination one can produce myopia, hypermetropia, astigmatism. Imperfect imagination may even produce organic changes of the eyeball. Imagination when used properly is a very helpful method for improving eyesight.

Syphilis.—It is a general belief that syphilis is the cause of most diseases of the inside of the eye, such as iritis, choroiditis and retinal diseases, and antisyphilitic treatment is adopted even when there is no history of syphilis or the blood examination is negative. Most of these cases become worse in spite of persistent treatment. The fact is that very few cases are affected by syphilis and cured by anti-syphilitic treatment. It is often seen that people suffering from syphilis have no eye-trouble; even if such persons suffer from eye-diseases, that may be very well due not to syphilis but to the same causes as in other patients who have no syphilis. Most of the cases suffering from internal diseases of the eye are benefited in a short time by the methods which relieve the strain of the eyes. A considerable improvement of sight can be demonstrated within a few minutes or hours or days in some cases. This suggests that strain is the real cause of these organic diseases of the eye.

Teeth.—Pyorrhoea and other dental diseases are usually supposed to be the cause of many eye diseases, and patients are often advised to get the

teeth extracted. This hit is usually made when no other cause is found. By the extraction of the teeth the patient very seldom gets any benefit. Most of the cases in whom extraction of teeth is advisable are greatly benefited in a short time by the methods which relieve the strain. I do not mean that bad teeth should not be attended to, but a drastic step of getting the teeth extracted immediately often proves useless.

Constipation.—Chronic constipation generally causes mental strain and often exaggerates the eye strain if it is already present. Treatment of constipation by regulating the diet or enemas and purgatives proves very helpful in relieving the strain.

Trachoma.—When there is smarting sensation in the eye, pain in the eyeballs, redness in the eyes, or discomfort after sleep, it is usual to diagnose and treat such cases for trachoma. Usually no permanent benefit comes by such treatment. Long treatment with caustics adds more complications. Most of these cases suffer from eye strain and are quickly benefited by relaxation methods. Of course, persons who really suffer from trachoma require anti-trachoma treatment also.

Old age.—Most people have difficulty in reading books or newspapers, when they arrive at the middle age, and they are dependent upon their glasses. The decline of near vision usually goes on increasing and higher power glasses are used. This decline of eyesight is said to be the result of growing old, but this is not true because there are people who maintain perfect eyesight in old age. There are also people who regain their vision after having lost it for many years. Moreover, when other sense organs—ears, nose etc.—do not grow old or become defective in old age, why should the eye?

The truth is that a strain to see at the near point causes imperfect eyesight, and produces a form of hypermetropia. Use of glasses, in a majority of cases, makes the condition worse. The patient finds that the large print which he could read without difficulty before he got his glasses can no longer be read without their aid. Sometimes the sight declines very rapidly and the patient changes his glasses to higher powers quite frequently till no more power can be added to the glasses and still the patient suffers from discomfort in reading; and if the patient does not get cataract, glaucoma, or inflammation of the retina, he may think himself fortunate. When the strain is relieved or corrected by relaxation exercises, the patient improves his eyesight.

Adverse conditions.—Bright lights, artificial lights, dim lights, sudden fluctuations of light, reading fine print, reading in moving vehicles, etc., have long been considered "bad for the eyes," and libraries of literature have been produced about their supposedly direful effects. These ideas are not correct. When the eyes are properly used, vision under adverse conditions not only does not injure them, but is an actual benefit because a greater degree of relaxation is required to see under such conditions than under more favourable ones. It is true that such conditions may at first cause discomfort even to persons with normal sight; but a careful study of the facts has demonstrated that only persons with imperfect sight suffer seriously from them, and that such persons, if they practise central fixation, quickly become accustomed to them and derive great benefit from them.

Reading of fine print, when it can be done without discomfort, has invariably proved to be beneficial, and the dimmer the light in which it can

be read, and the closer to the eyes it can be held, the greater the benefit. The reason is that fine print cannot be read in a dim light and close to the eyes unless the eyes are relaxed, whereas large print can be read in a good light and at ordinary reading distance although the eyes may be under a strain. When fine print can be read under adverse conditions the reading of ordinary print under ordinary conditions is vastly improved. By reading fine print daily one can escape from all those eye troubles which now so often trouble the later years of life.

Use the eye.—The idea that it rests the eyes not to use them is also erroneous. The eyes were made to see with, and if when they are open they do not see, it is because they are under such a strain and have such a great error of refraction that they cannot see. The remedy is not to avoid either near work or distant vision, but to get rid of the strain which underlies the imperfect functioning of the eye at both points.

Sleep.—Most people, when told that rest or relaxation will relieve the strain and cure their eye troubles, ask why sleep does not do so. The truth, however, is that eyes are rarely completely relaxed in sleep. If they are under a strain when one is awake, that strain will certainly be continued during sleep, to a greater or less degree. This is why people waken in the morning with eyes more tired than at any other time, or even with severe headaches.

Rest and relaxation.—The fact is that when the mind is at rest nothing can tire the eyes, and when the mind is under a strain nothing can rest them. Anything that rests the mind will benefit the eyes. Many patients, once regarded as incurable, have derived great benefit by the methods which relieve their strain and relax their mind and eyes. For example, Lord ARUN SINHA of Raipur came for treatment from Calcutta. He had chronic iritis with a pinhole pupil and cataract in both the eyes. He had consulted many doctors. The right eye was operated five times by a European Ophthalmologist of great fame, and ultimately it became totally blind and hopeless. The left eye had little vision but was unable to read or write; the present vision was also deteriorating. The doctors neither advised operation in this eye nor could do anything to improve its condition. He was given the relaxation treatment for about a month, at the end of which the vision improved considerably and the pupil showed dilatation. He could read newspapers and write letters.

Psoriasis*

K. D. LAHIRI, M.B., B.S.,
Senior Clinical Assistant in Skin and Venereal Dept.,
Medical College Hospital, Patna.

PSORIASIS is a type of chronic dermatitis which is characterised by silvery scales set on blood-red raised surfaces on the body.

The author (1942) has reported uncomplicated cases of psoriasis in 17 adults and (1943) uncomplicated cases in 5 children from Bihar. The present case under review is a case of psoriasis associated with sub-clinical pellagral dermatitis in an adult.

Psoriasis is a complex reaction and is supposed by many as an allergic reaction of the skin associated with hormonal deficiency together with avitaminosis.

* For detailed study the readers are recommended to read *Common Skin and Venereal Diseases* by the author to be had of Kamala Book Store, Patna, E.I.Ry.

Though common in both sexes all the 21 cases reported by the author from Bihar were in males. Frequently, it starts at puberty, but Low (1924) observed that RILLE reported this condition in a case of 38 days old and WATSON in an old man of 85 years of age. There is no familial influence but INGRAM (1938) has traced in 30 per cent. of his cases the heredity factor.

Pathology.—There are infiltrations in the papillary layer of the corium with dilatation of blood vessels and an increase of horny layer with parakeratotic change. INGRAM (1938) thinks that psoriasis is really a superficial condition.

Varieties: (1) Psoriasis punctata; (2) psoriasis guttata; (3) psoriasis nummularis; (4) psoriasis circinata; (5) psoriasis associated with skin conditions such as pellagra and cutaneous syphilide.

Signs and symptoms.—Silvery scales in patches all over the body. Itching is present and is paroxysmal in nature. Present only on the extensor surface of the body, elbow, knees. The distribution is almost symmetrical.

Differential diagnosis.—(1) Eczema; (2) seborrhoeic dermatitis; (3) papulo-squamous syphilide; (4) tinea circinata; and (5) pityriasis rosea.

Treatment.—The author (1942) advocated administration of vitamin C. Arsenicals like Fowler's solution are used as a routine, 5 drops three times daily. Thyroid has been advocated in $\frac{1}{2}$ grain thrice daily doses by INGRAM (1939) and Pituitary Extract and Adrenal Cortex by MADDAN (1940). Injection of Collo Sulphur has been advocated by GRAY (1937) and Collo Bismuth injection in 0.5 c.c. bi-weekly doses by the author (1942). Locally 5 per cent Crysophanic acid application is very good.

CASE REPORT.—M. H.; Muhammadan male of 38 years of age (*vide Illustration*) and a cultivator by profession; and a native of Bihar. Married—and has 2 children, all living.

History:—Family history—nothing particular except that father died of a very chronic wound of tongue (which might have been cancer tongue) at the age of 72 years.

Personal History:—No history of venereal diseases. Wife never had any miscarriage or abortion. Children are all healthy and living.

Patient has suffered from stomatitis occasionally for the last 10 to 12 years and has been suffering from scabies-like skin condition at the elbows and of the head for the last 2½ years since the death of his mother from cholera. The skin conditions are gradually increasing and troubles him most due to itching. The whitish skin conditions look prominent with rough grey skin condition on his wrist and arm and the butterfly patch on his face.

His blood Wassermann reaction was negative and his prostatic smear examination did not show Nisserian gonorrhoeal infection too. He had pellagrous skin conditions and had acute stomatitis with irregular bowels.

He had 500 mgm. Nicotinic acid daily for one week with liver diet and 2 lbs. of milk in addition to 4 limes and enough of green vegetables. His diarrhoea and pellagrous skin conditions improved but did not disappear until I put him on Vitamin B complex 300 mgm. together with Vitamin C 100 mgm. daily for seven days when the psoriasis also improved in the sense that his face and neck and the scalp became devoid of any silvery

scales or any raised hyperæmic base. Few patches were left on the hands and trunk which got cleared up with 16 injections of 0.5 c.c. Collo Bismuth given every third day and with only one exposure of ultra violet on the body. The patient left the hospital and came back just after one year and seven months for the infection of acute amœbic dysentery when there was no relapse of his psoriasis.

Discussion.—In the treatment of psoriasis nutritional skin conditions like pellagra should not be lost sight of. The beneficial effect recorded by the administration of Vitamin B complex and Vitamin C together with Collo Bismuth injection and exposures to ultra violet therapy are valuable for the treatment of psoriasis.

Acknowledgement.—I am thankful to the House Surgeon, Dr. Mehrotra and Dr. Nawab for help and encouragement. For the permission to publish the case report I am grateful to the Superintendent, Dr. B. P. Varma, M.B., Ch. B. (Edin.), F.R.C.S., (Edin.).

Cases and Comments

Fibrous Epulis

P. RAMA RAO, M.B., B.S., (Andhra),

AND

R. N. RAJU, M.B., B.S., (Andhra),

Osler Hospital, Podur, P.O., (Via) Palakol, (M.S.M. Ry.).

P. Satyavati, H.F.C., 2½ years. History of a gradually growing lump from the floor of the mouth on the left side since one year. It began as a small nodule over the region of the future last molar on the left side. The lump grew to the present size and has been resting on the tongue. On examination it was tempting to think that the mass arose from the posterior part of the tongue, as it was moving with the tongue. On palpation, the tumour was somewhat lobulated, firm, of the size of a lime, having attachment through a stalk to the gum margin on the left side at the posterior-most extremity. The tumour was adherent to the palato-glossal fold and the left half of the soft palate. The reflexion of the mucous membrane from the tumour to the side of the posterior half of the tongue was palpable as a fold.

Clinical diagnosis of fibrous epulis was made. Operation under semi-open C₂ E₃ mixture induction and maintenance by insufflating the same mixture through a nasal tube into the naso-pharynx. A sand bag was put under the shoulders to keep the trachea high up and thus avoid any blood trickling into the trachea. The mouth was opened wide by a mouth-gag, tongue was drawn forward by a clip, and the tumour was caught by a volsellum-forceps. With a cataract knife the tumour was separated from the gum margin by a clean sweep, all the adhesions around were separated and the tumour enucleated. The main bleeding points were clamped and ligated. Blood was prevented from trickling into the trachea all through by packing the oro-pharynx with ribbon gauze. Finally the pharynx was inspected by inserting a Boyle-Davis gag, and the tumour was found to have been completely removed.

Patient was discharged cured from the hospital in a week.

Psoriasis with Pellagra Dr. K. D. Lahiri, Patna.



(M.H., M.M., 38 yrs. cultivator). [Vide page 41.]

Fibrous Epulis

Dr. P. Rama Rao and Dr. R.N. Raju, Podur.



(P. Satyavati 2½ years).

of the gum margin was noticed teeth have not erupted. There he tumour. 2. This tumour had the gum."

actice of Surgery, 1937, Vol. II.

losed Fever

A, M.B., B.S.,

on 22nd September, and was

alf back she had an attack of ich yielded to Quinine. She was months back. She had been with some other members of the at some places on the feet and und at the clavicular regions in tches. Ever since her childhood atous eruptions. Any breach on ematous vesicles. She had an est of her history was uneventful isease during her childhood.

started on 22nd September with ure recorded that day was 100° F. perature was 101 which rose to igue was coated, chest and abdo- 2 with 103° F. temperature and t was a bit congested and angry At 12-30 in the night between ntly asleep, she screamed, had he fits lasted for a few minutes 3 30 a.m. she had another fit of and the left angle of the mouth. with wetting of the bed etc. d by her and when loudly called without recognising anybody. re continued about 103.4 and arying intervals.

xed signs of meningeal involve- gidity of the neck except at the ere not exaggerated. Babinski's . At 10 p.m. coma deepened; uration and then became more or ie face muscles. Swallowing and leg remained flaccid and motion- xed and drawn towards the body. d the next day, the 25th, with ie convulsions which made her

present a heart-rending sight and an object of pity and compassion for the struggle she was waging so valiantly with the impending death, which ultimately rung down the curtain and closed the painful and pathetic scene at 3.30 p.m. on 25th September.

Clinical tests.—Blood slide taken on the morning of 24th showed no other departure from the normal except slight relative increase in large mononuclears. No M. P. could be expected as she had already received gr. 10 of Quinine Bihydrochlor I.M. at night previous to the withdrawal of the blood.

C.S.F. was withdrawn under normal pressure and without any detectable abnormality as reported by the laboratory.

Treatment.—With the history of the malarial fever $1\frac{1}{2}$ months back and the present attack ushered in with slight shivering, she was given gr. 15 of Quinine on the first day orally and it was repeated next day. On the night between 23rd and 24th after the second convulsive fit at 3.30 p.m. she was administered gr. 10 of Quinine Bihydrochlor I.M. At 10 a.m. on the 24th she was given gr. 5 I.V. with 20% Glucose Sol. 10 c.c.; grs. 5 I.M. was repeated at 10 p.m. after which no further Quinine was administered as there was no improvement whatsoever and the convulsions became more or less continuous.

After withdrawal of 5 c.c. C.S.F. she was given Glucose 25% Sol. 100 c.c. I.V. at 1.30, a.m. and the weak and thready pulse indicating myocardial weakness was controlled with Coramine I.M. repeated every four hours. At 7 a.m. on the morning of the 25th, 50 c.c. more of Glucose was administered along with 43,000 units of Anti-tetanic Serum, given I.V. and partly I.M. She was also given Mag Sulph intravenously to control convulsion but without avail. But all this made no change in the condition of the patient and she rapidly went down hill and succumbed to the disease at 3.30 p.m. in the afternoon of 25th.

Conclusion.—The above notes of a case which remained undiagnosed to the last and failed to respond to all that was done symptomatically are published with a view to elicit views of my medical colleagues who could throw some light on the nature of the virulent toxic condition which carried away the young patient within almost 72 hours of the onset. She was given anti-tetanic serum in consultation on the presumption that there might have been entry of tetanic germs through eczematous skin lesions she had recently on the nape of the neck and upper part of the chest, though the character of the convulsions was not typical of the tetanic poisoning. Was there any septic embolism in any of the cerebral arteries? What was its origin?

Hypotony Following Cataract Extraction

P. K. BHAT, M.B., B.S.,

Ophthalmic Surgeon, Eye Hospital, Bhavanagar.

GENERALLY speaking the common complication which follows cataract extraction is increased tension or secondary glaucoma usually after a week; sometimes even after a year or two. Diminution of intra-ocular tension following penetrating injuries or trephining is common but hypotony following cataract extraction, where the healing of the wound is complete and where there is no fistula of the cornea, is not often met with.

The following is the case record:—

A Mahommedan female, aged 38 years, with ripe cataract in the left eye and unripe cataract in the right eye with left vision was operated for cataract extraction on 2nd February 1944.

Examination before operation.—V R E=M. B.; V R E=4 ft. not improved. Reaction of both pupils was normal both direct and consensual. Depth of the anterior chamber normal as seen through slit lamp. Tension both eyes was 22 mm. Hg. under Schiotz tonometer. Fundii of both eyes could not be seen.

General condition of the patient.—Patient was fairly tall and slim. Slight pallor of the skin present.

Examination of blood films.—Polymorphs-neutrophils 68%; Lymphocytes 24%; Large monocytes 4%; Eosinophiles 2%; Basophiles 2%; Total R. B. C. 4 millions per c.mm.; Total W.B.C. 7,200 per cmm.; Colour index .8%.

Urine examination.—Nothing abnormal found.

Blood pressure.—120 mm. Hg. systolic; 80 mm. Hg. diastolic.

Operation was done on 2nd February 1944 in the morning under local anaesthesia and 2 c.c. retrobulbar Novocain 2% with Adrenalin. Intra-capsular cataract extraction with iridectomy was done; no complication occurred during operation and the cataract wound healed perfectly within ten days and there was $V \frac{6}{24} \bar{c} + 10 \text{ D Sph.}$ on the 10th day of the operation. Guttæ Argyrol 10% was given for after treatment. On the 22nd day, i.e. on 24th February, patient complained of pain and photophobia in the operated eye and she was brought for examination.

The aphakic eye showed marked ciliary injection haziness of the cornea and striate keratitis. Tension on palpation was 3 T; vision only mounting of fingers. On slit lamp examination there was oedema of the cornea and folding of the Descemet's membrane and the endothelium on the posterior surface of the cornea was swollen and cedematous. On account of haziness of the media fundus could not be seen. There was no apparent injury to the eye. The cataract wound was quite in apposition and no fistula was present.

Treatment.—Hypertonic saline subconjunctively and Dionin and Atropine drops were ordered. Ultra-violet irradiation from small Hushberg radiation lamp was given. Gradually the oedema of the cornea began to

disappear and after 4 weeks the patient's lesion was $\frac{6}{60} c + 10 D$ Sph. though there was still some striate opacities in the cornea.

Causes of hypotony:—It may be due to: (1) Diminished secretion of the aqueous due to: (a) nerve inhibition; (b) vascular disturbance; (c) injury to the ciliary epithelium. (2) Increased excretion either through normal or newly formed channels.

Either diminished secretion or increased excretion may be brought about by the following:

- (1) Perforating wounds of the eyeball whether accidental or intentional (as in iridectomy or trephining for glaucoma).
- (2) By pressure as in tonometry or by bandage.
- (3) By use of drugs: Cocain, Pilocarpine, Eserine, etc.
- (4) Paralysis of the cervical portion of the sympathetic from trauma or from excision of the superior cervical ganglion.
- (5) Detachment of retina.
- (6) Shrinking of an exudate in the vitreous in which the atrophy of the eye-ball is developing as in iridocyclitis.
- (7) Slight decrease in tension accompanies many cases of inflammation of the cornea both suppurative and non-suppurative and also after erosions of the cornea.
- (8) Contusion or concussion of the eyeball condition called contusion hypotony.
- (9) Diabetic coma a very prominent sign.
- (10) FUCHS has described a condition called ophthalmal malacia or essential phthisis in which diminution of tension occurs spontaneously without known cause. The eye becomes soft, smaller, and injected and marked photophobia and neuralgic pain. This may last for hours or days when it gives place to the normal condition.

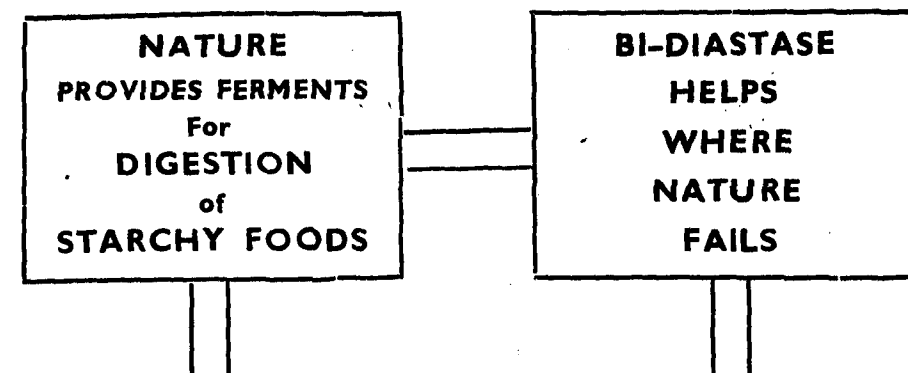
I attribute my case to this condition of ophthalmal malacia.

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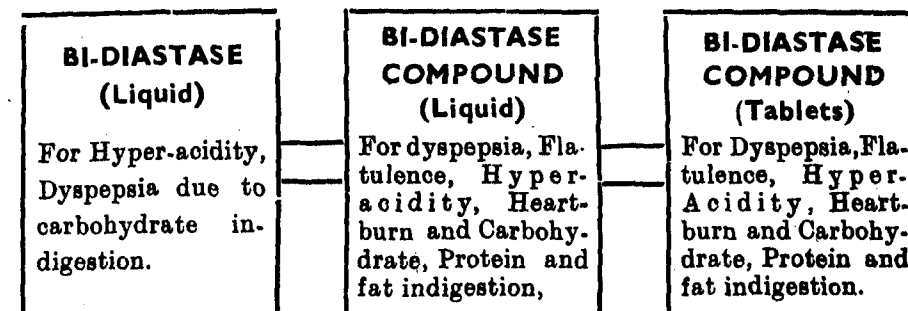
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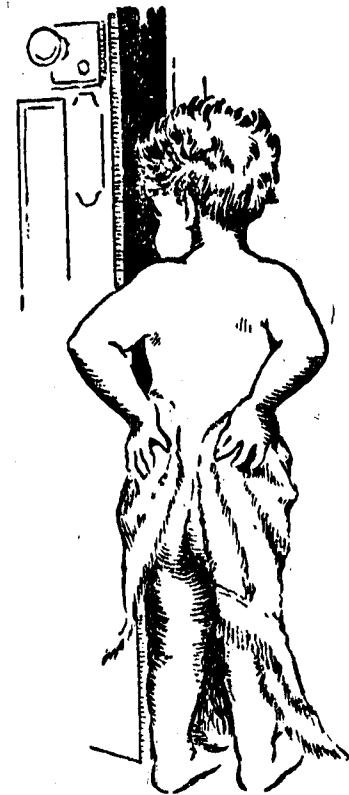
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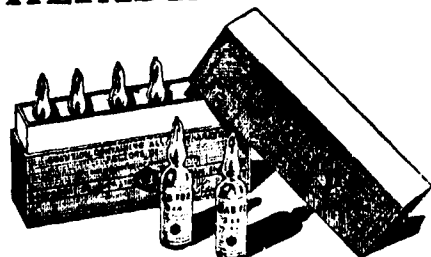
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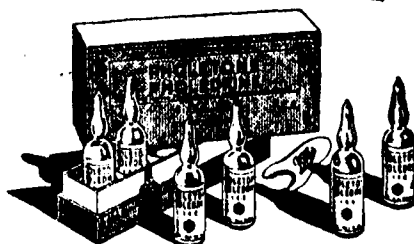
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No.

The New Year

IN the eternal epoch of the seasons, 1944 has become a memory, and it is now upon us. It is time once again to exchange the old, old wish is so heartening. **Happy New Year and best of luck.**

Our sincere greetings go out to one and all our readers with this issue of THE ANTISEPTIC. We have done our best to cram it with as full of things as the proverbial stocking, subject to the limitations that have imposed on us by the various Control Orders.

The occasion, apart from the significance that is given it all the way over, is one which we cannot skip over without a word of self-adulation marks the end of our forty-first year of continuous publication. And it is a brighter, mightier, breezier ANTISEPTIC we would have our readers expect during the coming years.

For those who make it, THE ANTISEPTIC has so far been an adventure of faith. We are not giving away the secrets of the sanctum when we say this—we only want to imply that we have reason for modest rejoicing.

We have been as keenly concerned with the production of a journal that pleased us as about pleasing our readers. We have just spent an enjoyable hour going through the issues of the last year's journal and have come to the conclusion that with the material now increasingly made available to us we can make it much more comprehensive and useful than it had been possible in the past.

The way we have contrived successfully to overcome editorial difficulties in spite of terribly changed conditions has prompted many an anxious reader and advertiser to thank us for all that we have done to maintain and, wherever possible, to improve the standard of the journal. That is the ideal we have placed before us, and we shall unflinchingly carry it out.

Our subscription list has increased manyfold. The casual reader became a regular subscriber. The subscriber recommended us to a friend. And that friend mentioned us to his friend—and so the good work went on. It has all been very gratifying. Only we are afraid that at this rate we shall not be able to meet the increasing demand made on us owing to circumstances beyond our control.

Our achievements in the past have been possible only by the splendid support that we have received from our contributors. In spite of a large number of medical men having joined the ranks of fighting forces we have received enthusiastic support from the doctors. They have always responded willingly to our requests and demands on their time and leisure. Our advertisers have also been with us through these difficult years. When the Paper Control Order compelled us to ration out space and raise the rates they willingly submitted to these restrictions and demands on their exchequer and helped us tide over these difficult days. To both of them **THE ANTISEPTIC** owes a deep debt of gratitude.

May we foregather on this old anniversary for many, many years to come!

It will not be out of place if we view in retrospect the year that has now left us. It is memorable from every point of view and it will go down in history as the turning point in the history of the Second World War. To us in India too, the year that has passed away is not without some significance. In spite of the political deadlock continuing, we find in our ruling classes and their allies a realisation that unless the problem of India is solved, and solved to the satisfaction of all true lovers of democracy, the world cannot be made safe from future wars. That itself is no mean achievement. And let us hope and trust that it would not be long before this feeling is translated into action.

To the medical profession also, the year had been noteworthy. Thanks to the untiring zeal and devotion of some of our brethren, an Association of Physicians of India was brought into existence during the year under review. The organisers could not have made a better choice than **DR. JIVRAJ MEHTA**, Ex-Dean, Seth G. S. Medical College and K. E. M. Hospital, Bombay, to inaugurate the Association. His address was worthy of the occasion and deserves to be read, re-read and digested by all the members of the profession who desire to safeguard its greatness and importance.

To the sceptics who feared that the starting of this Association would in some way or other affect the prestige of the Indian Medical Association whose doors are wide open to all the members of the profession, **DR. MEHTA** gave the most effective answer. "Had I the faintest doubt in my mind that the inauguration of this Association would in any way affect the function, the importance, the utility and popularity of that great body of medical men and women in India—the Indian Medical Association, I would not have had anything to do with this Association, however well sponsored it might have been from eminent quarters." And in support thereof he quoted from the circular issued by the organisers, that "it is of advantage to have a forum where one can exchange and discuss ideas and experience essential to our branch of the profession. The war has given a fillip to research in the means and methods of treatment of many diseases and at the termination of it there will be to the credit of medical knowledge a considerable volume of data which we should take advantage of."

While on the question of research the President could not but refer to the step-motherly attitude of Government to this most important branch of work: "The State in India has, alas, not yet properly realised its duty towards medical research.....The total amount disbursed by the body (**I.R.F.A.**) on medical research which has amounted to 13 lakhs a year in the late twenties, has been steadily reduced year by year, until it came down to less than 5 lakhs last year...It is no wonder, therefore, that unlike

as in other countries, barring perhaps a couple of institutions, medical research forms hardly any part of the normal activities of Medical Colleges in India." But his criticism did not stop there. He strongly protested against the "most nefarious practice which had grown up to the detriment of the spirit of research, of the senior officers or heads of departments or of laboratories taking the main credit for the research work done and assuming for themselves the entire authorship or the senior authorship of papers published." This will kill the enthusiasm of young medicos who are interested in research work and do most of it. It is therefore necessary to put down this tendency with an iron hand. And this can be achieved only if the junior members of the profession assert themselves.

The problem of medical education received due attention at the hands of the President. "The medical curriculum," he said, "has long since reached the limit of human endurance. The course must be simplified. The curriculum in most cases should be shortened. It would not be wrong to say that about 75% to 85% of an average general medical practitioner's work belongs to the sphere of medicine proper.... With such proportionate knowledge of the various branches of medicine, it would be naturally expected that at least three-fourths of the time spent in clinical studies, during the hospital course of the study, i.e., in the last three years of the Medical College career, should be devoted to the study of the subject of medicine proper. Instead, he devotes barely a third of his time prescribed for clinical work to such study, while the other subjects take a lion's share of the time set apart for clinical work. Medical education has thus become topsy-turvy, and it behoves us to see that such anomalies as exist in the rule laid down by the Universities and the Medical Council of India are rectified as early as possible, and the burden of students lessened." We will only add, "and the usefulness of medicos increased." The media of medical instruction was also touched upon by him. He has absolutely no fear that the standard of medical education would deteriorate with the change of language. "It is the opinion of experienced teachers," he says, "that with the exercise of proper care in the planning of the curricula, in the appointment of suitable teachers and examiners, the standards should show a definite amelioration instead of a deterioration." Such an opinion, emanating from those experienced in the art of teaching, deserves the careful consideration of the authorities.

The All-India Medical Conference which held its 21st session in Cawnpore in December last had the good fortune to be presided over by him. His presidential address was a bird's eye view of the position in India and a clarion call to the medicos to rise to their full heights to discharge their great and onerous responsibilities. He started with an earnest appeal for unity among all ranks of the profession. "Unless and until we realised that union is strength and organisation means influence," he said, "one shall not only not be able to serve the interests of the profession, but also fail in the building of the nation and in the service of its humanity." This appeal is timely and very necessary too, since the view is prevalent among a small section of the All-India Medical Licenciates' Association that such an amalgamation would affect their interests. The safeguards he has suggested are more than enough not only to allay their fears in this regard but also in regard to the utilisation of the funds of that Association. Besides this, of about 40,000 qualified members of the profession only about 6,000 are enrolled as members of the Indian Medical Association.

If all of them had joined the I. M. A. and made it the strongest and the most powerful organisation in India, as they are in England and the United States of America, would the Government of Madras have dared to place a ban on its members joining it? Now that this matter is again under the consideration of the Government of Madras as a result of the interview a deputation had with the Adviser-in-charge we trust they would see their way to retrace their steps.

The President very naturally devoted a considerable portion of his address to the paucity of medical relief in India. "India," he said, "has over 7,00,000 villages, so that even if we take the entire number of qualified medical men and women as in a position to serve the country through their art of healing, there is hardly one qualified medico to every 15 villages or one to every 9,000 of the population. This is obviously a very low proportion of medical aid to the Indian masses scattered in so many villages. The average, however, does not indicate the actual availability of skilled medical advice or assistance to the millions of Indians, since out of the 45,000 qualified medical practitioners, perhaps over 35,000 will be found residing and practising in the larger towns, which have no more than 12% to 15% of the total population of India. The remaining 85%, or over 32 crores of men, women and children, peasants and workers, are left to be served by not more than say 10,000 duly qualified medical men and women, hardly one to every 32,000 of the population."

How to remedy this sorry state of affairs? The opening of more medical colleges and the improving of the lot of the medicos in rural areas can alone solve the problem. Had the Governments in this country realised their responsibility in this matter as the Governments in other countries had done, and had they acted with foresight and wisdom, would we have witnessed the appalling spectacle of millions of men, women and children dying in Bengal and other provinces of starvation and epidemics like cholera and malaria as they did and are still doing? These have no doubt opened the eyes of the Government of India, and they have appointed a Commission under the chairmanship of Sir JOSEPH BHOORE. In the words of the late LORD CURZON, used on a historic occasion, the Government must give up the tendency of preferring the mere interests of economy to those of humanity. They must acknowledge to the utmost their obligation to spend the last rupee in the saving of human life and in the mitigation of extreme human suffering. This obligation, they can discharge only by spreading medical relief far and wide, i.e., by making medical aid available within easy reach to every man, woman and child in need of it, and, in the words of DR. GURUMURTHI who presided over the 11th Andhra Medical Conference held in Cocanada in November last, every one of them (medicos) becoming a Health Officer of and Health Inspector to the families under their care. But the hole and corner manner in which the Commission and its sub-committees had carried on their work, does not give us much cause for hope.

Besides, the tendency to import experts from abroad which has taken such a deep root in the Secretariats at the centre and in the Provinces, does not foreshadow good to the country. As DR. MEHTA observed, "it not only means an utterly unmerited slight upon the Indian medical profession of to-day, but also because those unacquainted personally with the condition of living in India can throw, during the course of a short peripatetic stay therein, no useful light on the solution of the problems. These outsiders must, in the

very nature of the course, be unfamiliar with our conditions, ignorant of our customs and unable to assess the actual circumstances of life and work of our people, which have such a close bearing upon the general state of public health in the country." If it is argued that experience gained in other countries might be useful to us, the proper course would be to depute some very competent medical men and women to tour other countries and learn first hand the manner in which the problem of public health has been solved there. This would be not only cheaper but also very useful since the knowledge so gained by their itinerary would be available to the country.

The importance of the drug and allied industries was stressed upon by the President and he also urged on the Government the need for giving proper representation in the Post-War Planning Committees to the Indian Medical Association. The absence of proper medical facilities in jails and the poor nature of the diet given to the prisoners and detainees were also brought to the fore by him. Coming as they do from one who has had personal experience, these defects should be attended to without any delay. The much-pampered Indian Medical Service did not escape his attention. Now that the A.I.M.C. has been constituted, there is no justification whatsoever for the Indian Medical Service to continue to exist. It should, in the words of the President, "go the way of the Education Service," and all posts now reserved for that service should be thrown open to Indians. The Conference went one step further and demanded of the Government to constitute separate medical services for the Indian Air Force and the Royal Indian Navy, the commissioned ranks of which should be reserved for Indian nationals only. Another demand of the Conference for the publication of an Indian Pharmacopoeia under the direction of the Medical Council of India, containing a list of medicines and compounds and the manner of preparing them is a very urgent one which should be taken on hand early if the new spirit that is now abroad as a result of the painful experiences of the past, is not to be curbed.

We have reserved to the last two important suggestions made by DR. MEHTA in the course of his Madras address, one relating to the encouragement of Ayurveda and the other regarding holding the Specialists' Conferences in one and the same place with the Indian Medical Association Conference. As he pointed out, "the observations of our seers on life processes, living organisms, animal life and plant life which are embodied in the books on *Yajur Veda* would even in these days hold their own in many respects, though it is painfully true that much of them is not followed by its own so-called votaries. It is the duty of the Medical Association to encourage the study of these books and to help all those who have taken up such study, and find out if they do not contain some observations on some diseases, which still baffle the modern scientists." The second suggestion is very timely. A great deal of advantage will accrue to the medical profession in general, and to the members of the specialist organisations in particular, by such co-operation. It would also lead to saving of much time and energy to the members who should find it burdensome to attend too many conferences a year, held at different places and at different times. We trust this suggestion will be taken up immediately by all the associations and a working arrangement arrived at as early as possible.

Post-menopausal bleeding as a hazard of diethylstilbestrol therapy.—Since diethylstilbestrol produces post-menopausal bleeding, it should be given only for pronounced menopausal vasomotor symptoms in daily doses not exceeding 0.1-0.5 mg. Dosage is often required only for a short time, some times only for a few days, especially as the symptoms tend to occur in exacerbations. Prolonged use and especially routine fixed dosage for prolonged or indefinite periods should be avoided. If menopausal bleeding follows relatively small doses of diethylstilbestrol, natural hormone preparations or a conjugated or synthetic hormone should be given. If the endometrium appears abnormally sensitive, testosterone will relieve flushes without producing bleeding. The prevailing picture in several instances of bleeding following diethylstilbestrol therapy was that of benign hyperplasia. Postmenopausal bleeding following large doses of diethylstilbestrol should be treated by withdrawal of the drug without immediate diagnostic curettage, which is advisable when the bleeding follows modest or unknown dosages. A woman with very moderate original vasomotor symptoms, who had taken more than 250 doses of 5 mg. diethylstilbestrol nightly, exhibited besides menopausal bleeding nervous tension resembling the so-called premenstrual tension. Similar conditions were also seen following long continued and excessive dosage of natural hormone preparations.—*J.A.M.A.*

Dicoumarin in the treatment of puerperal thrombosis.—Forty-three cases of post-partum thrombosis, comprising all degrees of severity, have been treated by oral administration of dicoumarin, in dosage of 300 mgm. daily, divided into three eight-hourly doses. The results are reported by A. Davis and Margaret Porter (*British Medical Journal*, May 27, 1944, 1, 718). Experimental and clinical trials have shown that the individual response to the drug varies considerably. The optimum dose should be sufficient to reduce prothrombin to 30 per cent. of normal, but the margin of safety is narrow so that it is essential to control the treatment by daily estimation of prothrombin, bleeding or clotting time. It is stated that the first-named test is the more accurate, but in the treated series recorded, in which all the cases were already established as thrombosis, estimation of bleeding or clotting time proved adequate. The reaction of the blood to dicoumarin usually begins about twenty-four hours after administration of the first dose, and there is as a rule an average daily rise in the coagulation time of one minute, independent of the initial normal clotting time, which increases more or less steadily for some days and then remains stationary or decreases, the effect of the drug persist-

ing for two or three days after cessation of treatment, and the coagulation rate usually returning to normal in two weeks. Two cases were noted, however, in which the clotting time remained considerably higher than the initial normal for some months. Comparison with an equal number of cases in which dicoumarin therapy was not used showed that in those patients who received the drug there was a definite amelioration of pain, fairly rapid diminution of oedema, and a shortened average period of hospitalization—nineteen days in the treated series compared with twenty-eight days in the untreated cases. There was also a lowered incidence of pulmonary embolism, and in only one case was the embolism severe. The patients tolerated the drug well and no untoward complications, or suggestion of spontaneous hemorrhage, were noted. In conclusion it is stressed that the drug must be carefully used, and daily expert estimation of prothrombin and clotting time is most essential.—*Practitioner*.

Pyridoxine hydrochloride in nausea and vomiting of pregnancy.—When given parenterally, pyridoxine hydrochloride (vitamin B₆) has been found of value in the treatment of nausea and vomiting of pregnancy. The results of an investigation of the results obtained by oral administration are now recorded by B. B. Weinstein, Z. Wohl, G. J. Mitchell and G. F. Sustental (*American Journal of Obstetrics and Gynecology*, March 1944, 47, 389) who have observed a series of seventy-eight patients, comprising cases of morning sickness, nausea persisting throughout the day, nausea and occasional vomiting, and nausea and vomiting of a degree to prevent retention of fluids or solids. In the first group the drug was given in initial dosage of one 10 mgm. tablet three times daily, the dosage being increased or decreased as necessary; in the second group the initial dose was two tablets three times daily; group 3 received two tablets three or four times daily, and group 4 were necessarily treated by intramuscular injections of 100 mgm. daily until vomiting was controlled, followed then by two tablets four times daily. The largest total oral dosage given to any one patient was 2500 mgm. and the largest total combined dosage 2280 mgm. In some cases, particularly those in groups 1 and 2, a favourable response was obtained within twenty-four to forty-eight hours, and in some instances the total dosage was as low as 30 mgm. In many patients the symptoms were not controlled until seventy-two hours had passed. One patient in group 1 was not free from symptoms until the tenth day of treatment. In this case phenobarbitone ½ grain t.i.d. also failed to produce relief, but after seventy-two hours of combined therapy complete relief was obtained. The results obtained in patients with more severe symptoms were striking.

and in two cases the total dosage required was only 160 mgm. No untoward reactions were noted. In a few cases there was recurrence after cessation of treatment for two to five days, but no recurrence failed to respond to resumed therapy. It is stated that in "highly-strung" patients combined sedative treatment and pyridoxine hydrochloride is of distinct value. Of the treated series thirty-four of thirty-seven patients in group 1 were completely relieved, and seventeen of eighteen in group 2. Of thirteen patients in group 3 eleven were completely relieved, as were eight out of ten patients in group 4; the other two required additional therapy.—*Practitioner*.

Spinning the occipito-posterior.—Douglas A. Mitchell writes in the *B.M.J.*, Oct. 14, 1944, that during his experience of 25 years of obstetric practice, he has found a method which has a limited application, but might possibly be used much more often if the necessary conditions were looked for and attempt made. The method depends upon the combination of several favourable circumstances, some of which are partly under medical control. These are as follow:

1. The membranes must be intact.
2. The head must not be absolutely jammed in the lower strait.
3. There must be at least two or three fingers dilatation.
4. There must be no disproportion between the head and the pelvis.
5. The attempt should be made within 24 hours (probably) of the onset of painful contractions of poor quality so characteristic of occipito-posterior presentations.

In such cases the usual approved method of treatment is by analgesics and psychological control of the patient. There is an alternative. In the course of examination, to determine position and progress a two finger vaginal examination should, if possible, be made with a knowledge of intact membranes. The head may be pushed upwards, between pains, possibly half an inch or more into the cavity of the pelvis. The result is that liquor amnii can pass down on all sides of the head; so that for practical purposes, it again floats in the lower part of the amniotic sac. Should the pressure upwards be timed to coincide with the onset of a contraction, the head will sometimes spin completely round to occipito-anterior practically instantaneously. Retaining this position by fundal pressure and promptly rupturing the membranes and letting off liquor will lead to a reasonably rapid and normal delivery.—*B.M.J.*

Chronic nephritis and toxæmia of pregnancy.—Both toxæmia of pregnancy and chronic nephritis in pregnancy may have as their chief manifestations edema, albuminuria, and hypertension. If such symptoms are noted before the twenty-fourth

week, a nephritic background is usually assumed and is highly probable. After that time, the tendency is to call the picture pre-eclampsia or, with convulsions, eclampsia. This statement, that the development of albuminuria and hypertension before the twenty-fourth week usually places the clinical picture in the group of pre-existing disease, whereas, after that time, eclampsia or pre-eclampsia is most likely, is an arbitrary criterion. In general it affects a working division, but obviously such a line of demarcation is going to leave many cases, erroneously classified. Differentiation may be very difficult or impossible. Significant hematuria, if it develops, can result from chronic hemorrhagic nephritis or from malignant nephrosclerosis. It also can result from pre-eclampsia or eclampsia. However, in the late conditions it is transient, lasts usually only for several days and tends to disappear.

In pre-eclampsia and eclampsia the renal function tests, particularly the concentration, urea clearance and phenolsulphonphthalein tests are not distinctly abnormal, whereas in the nephritic pictures they may be abnormal.

The previous history of the patient and the knowledge of the early findings are most helpful. If pregnancy has occurred before findings are more marked than in the previous pregnancy, particularly the albuminuria and hypertension which are noted earlier in the pregnancy than previously. An elevation of the nitrogenous waste products may develop in the blood. Pre-existing renal disease may not be known or evident before pregnancy and may not be manifested until activated by pregnancy. Under such circumstances differentiation between eclampsia and pre-eclampsia is most difficult.

The course of the disease through the puerperium may also be helpful in differentiation of this group. Residual effects are more likely to be present with previously existing renal disease. Further more repeated pregnancies tend to increase progressively the renal impairment and unfavourably affect the blood pressure.

It may be seen, then, that despite the differential points mentioned, it may not be possible to differentiate pre-eclampsia and eclampsia from pre-existing nephritis until the puerperal period is over, or even until a subsequent pregnancy occurs.—*The Bull. of the Tu'ane Med. Faculty*.

Toxæmia persisting after parturition.—The persistence of an abnormally high blood pressure reading is common after a toxæmic pregnancy. Prof. Brown and Miss Dodds (*J. of Obst. & Gyn. Brit. Emp.*, 1938, 46, 443) found a persistent hypertension in about 40% of patients who had suffered from pre-eclamptic toxæmia. Recent work by Theobald, and in the United States, suggests that this hypertension is probably not caused by the toxæmia, but that such patients are

potential hypertensives and that their blood pressure would rise with age even if they had never been pregnant. The American workers claim to have shown that hypertension is an extremely common condition and that, in fact, 40% of adults actually or potentially are hypertensive. Hypertension following a toxæmic pregnancy does not call for any treatment and is important mainly for its possible effect on subsequent pregnancies. Since Prof. Brown and Miss Dodds have also shown, in cases where the blood pressure exceeds 150/100 before pregnancy, or in the first 20 weeks, in only 30% does the foetus survive.

It is known that albuminuria may take a long time to clear up. A case has been recorded where albuminuria persisted for two years after confinement and then cleared completely. No treatment is required. The persistence of hypertension and albuminuria together for a long time after child-birth is suggestive of either chronic nephritis or malignant hypertension though neither of these is likely in the absence of casts. In such cases, however, examination of the fundus oculi and renal function tests should be carried out.—*B.M.J.*

The Care of the foetus during labour.—This discussion based on experience in 6,000 deliveries and on the literature covers measures for protection of the foetus in normal labour and in complications. Oxygen, dextrose, water and vitamins, administered to the mother, may often be life-saving for the foetus. Vitamin K should be given in all premature deliveries. Local procaine infiltration and continuous caudal anaesthesia apparently do not depress the foetus. The latter form of anaesthesia is recommended for women with heart disease. Short acting barbiturates and scopolamine lead to some foetal depression, which becomes severe upon super imposition of ether or cyclopropane anaesthesia. The danger of uterine tetany is increased by repeated doses of oxytocics and ergot. Vaginal instillation of an aqueous solution of antiseptic tends to prevent foetal infection in prolonged labour. Phenobarbital sodium intravenously, plus 1 gm. $MgSO_4$ and other barbiturates or paraldehyde if necessary for sedation, are recommended

for stopping the convulsions of eclampsia. During coma, the eclamptic patient should be given 3.5 L. 5% dextrose in sterile distilled water intravenously 1 day 5'82 oxygen one minute oropharyngeally, and blood transfusion if anaemia is present; to prevent pulmonary damage, the foot of the bed is elevated and constant suction aspiration is applied by a duodenal nasal tube. Pregnancy should be terminated by induction of labour preferably by rupture of the membranes, after recovery from the attack of eclampsia or after the eclamptic condition has become stationary.—*J.A.M.A.*

Therapy with female sex hormones.—The simplest remedy for premenstrual soreness and swelling of the breasts is diethylstilbestrol, 0.3 mg. daily, reduced to 0.2 mg. daily as soon as relief is experienced.

Keeping the daily amount of diethylstilbestrol below 0.5 mg. avoids induced endometrial bleeding and practically always suffices for the control of menopausal symptoms.

Once the husband has been shown to produce a healthy semen and wife to have a healthy vagina and cervix, palpably normal internal genitalia, patent tubes, regular menstruation from a secretory endometrium and endocervical mucus containing a fair number of active spermatozoa three to six hours after intercourse, failure to conceive may be considered functional. In these situations, general health measures, small doses of thyroid and mild intrauterine trauma or tubal insufflation within a few hours after intercourse at about midcycle every two or three months are likely to be effective without the use of sex hormones.

At the Free Hospital for Women it has been believed for some years that the daily ingestion of moderate doses of an estrogen enhances the wife's chances of pregnancy, and 0.1 to 0.2 mg. of diethylstilbestrol is now commonly prescribed. A study of the literature indicates that there is as yet no specific hormonal means of increasing fertility in the husband. For him the best treatment appears to be an active out-of-door vacation, in addition to general health measures and the giving of thyroid.—*Smith, G. V. New England J. Med. 230: 339 (March 23) 1944.—B.N.E. Med. Centre.*

MEDICINE and THERAPEUTICS

Evacuation of stomach of infants.—Emetics are not as commonly used as in former times. The emetics which are in common use may be briefly enumerated; Ipecac may be used in the form of powder, tea-spoon to a glass of water or 1 table spoon of the syrup in water repeated every fifteen minutes until vomiting is produced. Ipecac is uncertain and in large doses acts as a depressant. Zinc Sulphate and Copper Sulphate are no longer in common use. One-half tea-spoon of the Zinc Sulphate in 5 gr. doses in warm water repeated in fifteen minutes will cause vomiting with only slight constitu-

tional symptoms, but if not promptly ejected it may cause corrosion of the mucous surfaces. Mustard is safe but not certain in the desired action. One tea-spoon in a cup of warm water should be given, repeated every 15 minutes until vomiting is produced. Salt water, 2 table-spoons to a glass of water, sometimes produces the desired result. Apomorphine is a rapidly acting emetic, though most physicians are reluctant to use it for young infants on account of its toxic and depressant action. For young infants the dose is 1/60 dr. hypodermically or 1/12 to 1/20 dr. by mouth.

The emetics may be employed if lavage is contra-indicated or inadvisable, though as a rule they are less reliable and are likely to be more depressing. Lavage is the method of choice in removing poisonous substances from the stomach. A catheter will serve the purpose, the diameter of which should vary with the size of the child. A small funnel may be attached to the lumen of the tube and the stomach washing may proceed in the usual manner. In most cases it is preferable to attach a 20 c.c. glass syringe (larger size if available) to the catheter. Water should be slowly and gently forced through the catheter into the stomach, followed by immediate aspiration. This washing and aspirating process should be frequently repeated until the wash water is clear and free from injected poison. If the poison has caused erosion of the mouth, pharynx or digestive tract, the passage of a tube is contra-indicated. In washing the stomach great care should be taken that food particles and poisonous substances are not aspirated from the pharynx into the lungs. It has been suggested that this accident may occur when the stomach is evacuated in kerosine poisoning, causing pneumonia; others think that if the oil remains long in the stomach it may be absorbed, and partially eliminated through the respiratory organs, causing irritation and inflammation in these areas.—*J.A.M.A.*

Preventive aspects of coronary disease.—Plotz thinks that preventive measures are possible for a certain number of patients with coronary disease or myocardial infarction. First there is the patient who has already had one attack of coronary thrombosis. Next there is the man with angina pectoris. Next there are middle aged and aged persons with electrocardiographic evidence of heart damage without symptoms. Given certain conditions, their coronary arteries will fail. Somewhat less vulnerable but still requiring special vigilance are patients with hypertension, diabetes, myxedema, polycythemia or elevated blood cholesterol from any cause. Coronary thrombosis practically never occurs in an undamaged artery. It is preceded by an atheroma. Terrifying pain, shock and changes in the cardiogram are only the final act in coronary thrombosis. Preceding this there may be a prodromal stage of precordial pain resembling coronary pain. It is like a prolonged, atypical attack of angina pectoris and is a reflection of reduced coronary circulation and anoxia of the heart. If a patient falls into one of the vulnerable categories such an attack should lead one to suspect an impending coronary thrombosis. A man who suddenly develops angina pectoris for the first time should be put in the same category. These patients should be treated as though they had a cardiac infarction. Bed rest for five to fourteen days and use of papaverine to increase the pulmonary circulation are essential. Patients should be warned against the use of glyceryl trinitrate at this stage. If it does not relieve pain promptly it should

not be used again, because the repeated use lowers the blood pressure and increases the possibility of infarction. Sharp and prolonged reduction of blood pressure may be fatal to a patient of the vulnerable classes. Therefore he must be protected against such events as shocking operations, spinal anaesthetics, which lower the blood pressure, and severe hemorrhages. In this connection the author cites several illustrative cases and says that for the past two years he has employed slow plasma transfusion for those patients whose systolic blood pressure has fallen below 90. He feels that several lives have been saved by preventing the coronary head pressure from falling too low.—*J.A.M.A.*

A new test for acetone.—Mr. John, Ingrams, F.I.C., biochemist to the medical unit, Welsh National School of Medicine, Cardiff, writes to the *B.M.J.*: Rothera's test is a satisfactory one for ketosis. It is essential to perform this test in a room that is not used for blood and water analysis, otherwise contamination of the reagents will occur and inaccuracies will result. The new test for acetone bodies is carried out on a dry stable powder, containing sodium carbonate, ammonium sulphate, and sodium nitro-prusside. The powder detects the presence or absence of acetone in the urine. The colour reaction is identical to that found in Rothera's test, a delicate permanganate tinge develops which gradually deepens within two minutes if acetone is present. There are no fallacies and the powder will detect acetone in a dilution, 1 part in 10,000 parts of urine. Reagents are prepared thus: 3 g. of sodium nitro-prusside is ground to a powder in a mortar, add 100 g. ammonium sulphate and 50 g. of sodium carbonate anhydrous; mix well in the mortar; keep in a dry wide mouthed bottle. Method as applied to urine:—Place a small amount of the powder in a dry test tube (about half an inch). Saturate the powder with a small amount of urine. If acetone is present, the powder will develop a faint permanganate colour to a deep permanganate colour for larger amounts within two minutes. A brown colour does not constitute a positive reaction. By the use of this powder in clinical laboratory practice the performance of the test is simplicity itself and the cost is almost negligible. The test so performed is thoroughly reliable and very sensitive. It does away with objectionable ammonia.—*G.P.*

Changes in fundus of eye in arterial hypertension.—Elwyn lists the changes in the fundus of the eye that may be observed during hypertension and says that the pathologic basis of these changes may be described as follows: (1) for the edema, transudation of fluid from the capillaries into the substance of the retina; (2) for the cotton wool patches, accumulations of precipitated fibrin and serum; (3) for the hemorrhages, the presence of blood in the various layers

of the retina, especially in the inner layers; (4) for the sharply defined white spots, deposits of hyalin, mixed with lipids and with lipid-containing fat granule cells in the deeper layers of the retina, and for some of the more superficial white spots, a gangliform swelling of segments of nerve fibers in the nerve fiber layer; (5) for the glistening white spots, deposits of lipid and lipid-containing fat granule cells, and for the star shaped figure in the macular area deposits of hyalin and lipids along the fibers of the layer of Henle, which radiate from the macula. The changes in the retinal vessels are either functional, resulting in contraction of the arteries or organic. The organic changes are due to either aging of the vessels or to arteriosclerosis. Only some cases of hypertension show all of the enumerated changes; in others some of them are present, and again, in other cases perhaps none at all. In uncomplicated essential hypertension in its benign form the retinal arteries are not contracted. The changes in the fundus of the eye are only those of aging and sclerosis of the retinal vessels. In the later stages occur complications, such as a few hemorrhages, occasionally a few white spots and occlusion of branches of the central vein and artery, occasionally of the main vessels as well. A more important complication is temporary arteriospastic retinitis as part of a temporary arterial contraction in many organs. In malignant renal sclerosis or the malignant phase of hypertension all the signs of arteriospastic retinitis are apparent, that is, narrowed arteries, edema, cotton wool patches, hemorrhages, hyaline and lipid deposits and the star shaped figure in the macular area. Edema of the optic disks is also present. Because the malignant stage of essential hypertension is preceded by a long period of high blood pressure, aging and sclerosis of the retinal vessels are also seen, with angular tortuosity of the vessels, irregularity of the lumen and apparent arteriovenous compression. The subendothelial hyalinosis is also observed in some of the arteries of the retina and gives the vessels their white, "silver wire" appearance. In hypertension associated with eclampsia the changes in the fundus of the eye indicate the severity of the arterial contraction. As a guide to the advisability of artificial termination of the pregnancy the ocular changes are of less importance than the continuous observation of the state of the blood pressure. The arteriospastic retinitis produced in the presence of adrenal or pituitary tumors may resemble that of malignant renal sclerosis.—J. A. M. A.

Calcinosis universalis.—This is a condition in which widespread deposits of calcium occur in the skin, the subcutaneous tissues, and the connective tissue of muscles, tendons, fascia and nerves. The cause of the abnormality is unknown, though the early onset would suggest a hereditary basis. Myositis ossificans is closely related, if not identical. The local lesions are undoubtedly favoured by trauma and nodules develop at the site

of venepuncture or biopsy. It is stated that the affected tissues have an increased affinity for calcium and phosphorus and an increased phosphatase activity. Although spontaneous recovery has been reported, the outlook is bad and the patient is likely to die from progressive immobilization. Parathyroid hormone has been advised in conjunction with a low calcium intake, but is unlikely to be effective for long owing to the development of resistance to this hormone. It is recommended that the maximum dose tolerated should be injected on alternate days. Benefit has also been reported from sodium acid phosphate and from a ketogenic diet. Another possibility, apparently untried, in this disease, would be to diminish phosphorus absorption by the ingestion of aluminium acetate or gluconate, on the lines suggested by Helfet for parathyroid disease (*Brit. J. Surgery*, 1939, 27, 651). If attempts are made to deplete the body of calcium or phosphorus a careful watch should be kept on the skeleton in view of the danger of rickets. It would, in fact, be more rational to try to inhibit the excessive phosphatase activity, but little has been so far published in this field.—B. M. J.

Renal osteodystrophy.—Renal osteodystrophy is a new name suggested by Liu and Chu for the disease commonly known as renal rickets. This disease which also goes under the names of renal infantilism, renal dwarfism, and renal osteitis fibrosa, cystica is characterised by rickets-like deformities, osteoporosis, dwarfism, albuminuria, anemia, impaired renal functions, and a high blood phosphorus. The pathogenesis of this disorder, the outstanding feature of which is osteodystrophy, is obscure. Because chronic renal insufficiency is responsible for the skeletal changes, which resemble those of rickets, the condition was originally known as renal rickets. This term identifies the bony changes with those of rickets; but they are not identical, although the radiographical appearances and gross skeletal deformities are similar in the two diseases. And rickets responds to vitamin D, whereas renal osteodystrophy does not. The terms renal dwarfism and renal infantilism are equally unsatisfactory because they emphasize a feature which is absent when growth is complete and do not indicate the osseous changes. Albright, Drake and Suck are inclined to consider osteofibrosis as the essential pathological skeletal lesion, and so introduce the descriptive term of renal osteitis fibrosa cystica. Certainly rarefaction of bone and cystic absorption are the most prominent radiological features. Metabolic studies by Liu and Chu on five patients confirm the low urinary output of phosphorus, the high level of serum phosphorus, and the renal failure; the phenol sulphonephthalein excretion through the kidneys averaged only 6% and the urea clearance only 10% of normal. Increased intake of phosphorus resulted in increased excretion into the gut where it interfered with absorption of calcium, so that the patients were in negative

calcium balance. Liu and Chu also demonstrated the existence of chronic acidosis, which in turn tends to lowered blood calcium. In man and animals it has been shown experimentally that acidosis produces decalcification. These observations provide a rational explanation of the pathogenesis of renal osteodystrophy. The disease has its origin in renal insufficiency; this hampers the urinary excretion of phosphorus, the blood level of which is raised. Increased phosphorus excretion into the gut interferes with calcium absorption, the calcium forming insoluble calcium phosphate. Renal insufficiency by causing retention of phosphate, sulphate and other acid metabolites, causes base to be taken up, with resulting acidosis, which in turn further limits absorption of calcium. The low calcium intake in the diet of patients studied by Liu and Chu aggravated the condition still more. All these factors contribute to produce a low blood calcium and finally skeletal decalcification.

Although vitamin D is specific in the treatment of true rickets and of osteomalacia, it is ineffective, even in massive doses, in renal osteodystrophy; in fact it may make the condition worse by mobilizing phosphorus from the tissues. Liu and Chu found that A. J. 10 in dihydrotachysterol, one of the products formed by the prolonged irradiation and hydrogenation of ergosterol, was remarkably effective in improving the intestinal absorption and retention of calcium and phosphorus in their patients. They were however, unable to observe recalcification of bones, possibly because treatment was not continued long enough. There was evidence that iron improved absorption of calcium in patients studied, presumably by facilitating the excretion of excess phosphorus in the gut by the formation of insoluble iron phosphate. The administration of alkalies such as sodium bicarbonate and citrate also resulted in improvement, probably by preventing acidosis. The ultimate prognosis in patients with renal osteodystrophy is poor, but the treatment suggested by Liu and Chu—a limited protein, low phosphorus, and rich calcium diet, alkalies, A. T. 10 and iron is certainly worthy of trial.—B. M. J.

SURGERY

Wound-healing in compound fractures and repair of bone defects.—In war surgery it is felt that the open-wound method of treatment, with the routine use of sulfonamides, has resulted in a great saving of life and limb, even though many infections are seen after their use. The modification and control of the early fulminating infection have meant the saving of many limbs that might have been lost. The fact that these drugs are not ideal and do not do the entire task of eliminating infection does not in any way relegate them to disuse, but it does encourage the search for a more effective agent.

The question of the local use of sulfonamides is still a subject of discussion with good authority on both sides. In wounds with adequate blood supply, the systemic administration should be sufficient protection for the patient. However, if the drugs are properly used locally, no particular harm should be done. Powder or crystals of sulfanilamide or sulfathiazole, or mixtures of the two, have been used by many workers, some times along with buffers and other substances such as urea. Some claim has been made for the greater efficacy of the sodium salts of these compounds as local agents. Local therapy may do good in selected cases. Systemic therapy is given both orally and intravenously; the intravenous method is reserved usually for the immediately post-operative period. Sulfathiazole and sulfadiazine are the drugs most frequently used, and a sufficient amount is given to maintain a fairly high blood level. While sulfonamide therapy is usually effective, it is not without its drawbacks. The occasional failures, not infrequent toxic reactions, and the gastro-intestinal upsets, with depression of appetite in some instances, interfere with the proper care and nutrition so essential in these cases.

In some contrast to this, penicillin has

been found to be a more potent anti-bacterial agent, active against almost all of the common pathogenic organisms found in traumatic wounds, and almost completely non-toxic. There are no contra-indications to its use, but it should be realized that it is active chiefly against the gram-positive organisms and the gram-negative cocci, and is not effective against the other bacteria. Since most wounds contain organisms that fall into the susceptible group, penicillin should be effective. It is of benefit in mixed infections. Even in susceptible species, an occasional organism is found to be resistant to penicillin. This can be determined by testing the organisms in vitro against penicillin. The intramuscular route of administration is usually employed, since this method has proved very efficient, and is the one which can be used by nursing personnel without special care or training. Intravenous administration is used in selected cases which require rapid and constant concentration of penicillin in the blood and tissues. Subcutaneous administration is painful, and the rate of absorption is inconstant; so this route is not preferred.

Penicillin has been used clinically and found to be effective in controlling most wound infections associated with compound fracture, when used in full doses as an adjunct to a well-rounded surgical programme. As an effective dose 200,000 units per day, given by the intramuscular route, in 25,000 unit doses every three hours each 24 hours, is recommended. Since most patients with septic compound fractures require operative procedures, the "unsteady state" described by Lyons must be corrected rapidly, and whole blood and plasma are the only agents which quickly accomplish this. High-protein, high-calorie diet is used for adequate supply of proteins needed for the repair of tissue.

Penicillin has been used clinically and found to be effective in controlling most wound infections associated with compound fracture, when used in full doses as an adjunct to a well-rounded surgical programme. As an effective dose 200,000 units per day, given by the intramuscular route, in 25,000 unit doses every three hours each 24 hours, is recommended. Since most patients with septic compound fractures require operative procedures, the "unsteady state" described by Lyons must be corrected rapidly, and whole blood and plasma are the only agents which quickly accomplish this. High-protein, high-calorie diet is used for adequate supply of proteins needed for the repair of tissue.

Wound healing is most satisfactorily effected under a combination of good surgical care—including operation with the patient supported by blood and plasma therapy—adequate diet, and control of infection by penicillin therapy. With the patient in good condition, and with the use of penicillin in the prevention of infection, reconstructive surgery can be performed at a shorter interval of time after complete wound healing than was formerly considered safe.—(Mech, K. F., Medical Corps U. S. Army: *Journal of Bone and Joint Surgery* 26: 442-447, July, 1944.)—U. S. O. W. I.

Protein deficiency in surgical patients.—Hypoproteinemia is a common result of surgical disease as such, as well as the result of operative procedures which drain the protein deposits of the body. In this study plasma protein was determined in 278 surgical patients and the influence of surgery on the plasma protein levels was observed in 193 of these. Hypoproteinemia was encountered most frequently in bleeding peptic ulcers, carcinomas of the gastrointestinal tract, bowel obstruction and intestinal fistulas. In peptic ulcer patients it was corrected by liberal amounts of blood,

blood plasma and amino acids. Hypoproteinemia in carcinoma of the gastro-intestinal tract, bowel obstruction and intestinal fistulas was aggravated by surgery. Hypoproteinemia improved markedly if intensive therapy was employed. Of 32 fatal cases, 18 either showed a hypoproteinemia before or after surgery. Incidence of plasma protein rise was related to the amount of whole blood, plasma or amino acids, and combinations thereof administered. Consistent improvement was seen when 2,000 cubic centimeters or more of blood alone or in combination with plasma or amino acid was given. Whole blood appears to improve plasma proteins more than does plasma due to the value of hemoglobin as a protein source. The combination of amino acids and whole blood as a means of treating hypoproteinemia warrants further use. Finally, the daily observation of the total protein, hematocrit, and hemoglobin is suggested as an aid in deciding whether whole blood plasma, or dextrose and/or saline solution, meets the patient's requirements best.—(Meyer, K. A. and Koell, D. D.; *Surgery Gynecology and Obstetrics* 78: 181 (Feb. 1944))—U. S. O. W. I.

DERMATOLOGY

The prevention of the spread of furunculosis.—In support of the theory of a local causal factor in the etiology of furunculosis, P. B. Price (*Journal of the American Medical Association*, April 22, 1944, 124, 1189) points to the facts that the onset is usually in the form of a single infection invariably originating in hair follicles or the associated sebaceous glands, that the lesions are as a rule limited to one area of the body, and that relapses tend to occur in the original area. Blood culture, even at the height of infection, is nearly always negative. These facts do not support the theory of a blood-borne infection. Sterilization of the skin of the whole contaminated area, using a solution of ethyl alcohol exactly 70 per cent. by weight, has been carried out by the author in a series of cases, with most encouraging results. The treatment cannot, of course, be used on open wounds; therefore the correct time for its application is in the interval between the healing of the last furuncle and the onset of the next one. The solution is applied continuously for about twenty minutes with gentle gauze friction; the germicidal action of the alcohol solution is increased by friction, but it is essential that this be gentle, as anything in the form of vigorous massage or hard rubbing may push live bacteria into hair follicles. After application of the solution the area should be powdered with sterile talcum or zinc stearate. Details of four cases treated by this method are given. One patient, a woman

of thirty, who had been more or less incapacitated by boils on her legs for eight months and had failed to respond to chemotherapy, vaccines and other forms of treatment, was given light gauze friction with freshly prepared 70 per cent. ethyl alcohol solution for twenty minutes, the treatment covering both extremities from the hips to the ankles. The treatment was given in the interval when the latest boil had ceased discharging and before fresh ones could be seen. The patient was followed for four years and there was no recurrence of furuncles. In another case, a girl of ten who had not been free from boils scattered over the lumbar region, buttocks and backs of the thighs for over four months, was treated when a crop of furuncles was subsiding, the affected areas being continuously washed with the solution for thirty minutes. No more furuncles developed and the patient remained free from them for three years. The fourth case was a man of thirty-two with furuncles on the neck, cheek and chin, which had failed to respond to X-ray treatment, injections, local applications and chemotherapy. The hair on the face was carefully trimmed away and the affected areas gently washed with the solution for twenty-five minutes. No new furuncles developed and the patient was free from them for at least three years. In all, the author has treated eleven patients, and in each case prompt and permanent relief has been obtained.—*Practitioner*.

OPHTHALMOLOGY

Diagnosis of glaucoma.—A. G. Thens. *Minnesota Medicine* 27: 21 (Jan.) 1944.

According to Thens, glaucoma is the chief cause of blindness in the adult in the United States; and that this is chiefly

because patients with glaucoma often do not come to the ophthalmologist for treatment before vision has been irretrievably damaged. The general practitioner may aid in early diagnosis of glaucoma if its early

signs are recognized in "the general physical checkup," in examining persons for jobs for industry or applicants for insurance. Pain is not an early symptom of primary glaucoma, although there may be a sense of fullness in the eye especially after a heavy meal, after taking stimulants, or after viewing a movie. Increased intraocular tension is the characteristic feature of glaucoma and the size of the pupil is "a fairly good index" of the height of the tension, a wide pupil indicating high tension. The use of any drug that dilates the pupil, as belladonna or atropine, tends to increase the tension and may precipitate an attack of congestive glaucoma. Such drugs should not be used, therefore, in any case in which there is

"the least suspicion" of glaucoma. While ophthalmologists use the tonometer for measuring intra-ocular tension, a fairly accurate estimate may be made by palpation, if this method is used repeatedly. An elongation of the normal blind spot is an important early sign of glaucoma; the defect is observed first in the nasal half of the field; the visual fields for colors, especially for blue, contract before the visual fields for form. The internist and the general practitioner can determine these visual field defects by the use of some form of tangent screen for charting the visual fields; this does not require any special training and may easily be made a part of the general physical examination.—E. N. T.

Book Reviews

Fractures and Joint Injuries.—By R. WATSON-JONES, B.Sc., M.Ch. Orth., F.R.C.S., Consultant in Orthopedic Surgery to the Royal Air Force, Vols. I and II; third edition; pp. 407 with 1,353 illustrations. Publishers: E. & S. Livingstone, Edinburgh.

Mr. R. Watson-Jones is one of the world's foremost orthopedic surgeons. In the former editions, he claimed the experience of nearly 50,000 civilian casualties. He is now the fraci-civilian consultant to the R.A.F. on fractures and dislocations, and the experiences that he has now gained must surely be enormous. No one can be said to be more fitted to write a book on fractures and joint injuries than Mr. R. Watson-Jones. The present edition has been published in two volumes. Every chapter has been revised and new sections have been added on open and infected fractures, war wounds, sequestrectomy, vascular injuries, immersion foot and shelter foot, traumatic edema and the crush syndrome, Volkmann's ischemic contracture, traumatic asphyxia and chest injuries, radiographic diagnosis of union, internal fixation of fractures, "no-touch" technique, treatment by onlay grafting, burns and contractures of the hand. New recommendations are made in the treatment of supraspinatus tendon ruptures, Monteggia fracture—dislocations of the forearm, recurrent dislocations of the shoulder fractures of the navicular and fractures of the spine. Spinal injuries in air crews, naval casualties and air-borne troops are reviewed. New methods of treatment are described for congenital pseudarthrosis of the tibia, acromioclavicular dislocation, fracture—dislocation of the talus and supracondylar fracture of the femur.

Vol. I deals with (1) Principles of fracture treatment; (2) Pathological fractures and birth fractures; and (3) Injuries of the trunk and head. Vol. II deals with the injuries of the upperlimb, injuries of the lower limb and rehabilitation.

In a book that is uniformly well written, it is difficult to pick out chapters for special mention. Still chapters on vascular injuries complicating wounds and fractures, complications of plaster immobilization, open and

infected fractures in war wounds, and on rehabilitation are features of the book. The author is strongly in favour of rehabilitation centres and his section dealing with the organisation of an accident service forms very interesting reading. The last chapter of unusual and instructive cases is also very good. The material is well selected and the illustrations are excellent and the general "get-up" is of the very best type.

That the author should have been able to produce such a book during war-time, under the handicaps mentioned, speaks volumes about his ability and perseverance. We have no hesitation in recommending this book as a standard textbook and a book of reference on fractures and joint injuries.

Surgical Epitome.—By D. V. NADKARNI, M.S., (Bom.), F.R.C.S. (Eng.), VOL. I and II pp. 2016. Publishers: N. M. TRIPATHI LTD., Princess Street, Bombay, 1944.

Dr. Nadkarni's book is an epitome of surgery. It is not intended to replace any of the text-books on the subject. It is intended to provide a means for a very rapid revision of the subject by the student just before an examination or by the surgeon just before an operation or a clinical lecture. In fulfilling this aim, the author has succeeded. The whole subject has been divided into 4 parts: (1) tissue surgery;—or surgery of anatomical structures; (2) regional surgery—surgery of the different anatomical regions of the body; (3) systemic surgery—surgery of the different physiological systems of the body; and (4) some general states—general surgical conditions. Each section has been divided into the well-known pathological heads: (1) congenital abnormalities; (2) trauma; (3) infections; (4) specific diseases; (5) new growths; (6) operations; and (7) important points—the last being a special feature of the book, these points being collected from a vast amount of literature and personal experience. Every disease has been treated exhaustively under various sub-heads.

This is the first of the epitomes written by an Indian doctor for Indian students, and Dr. Nadkarni must be congratulated on

making this attempt. We are sure it will be useful for practitioners of surgery and to medical students:

The Radiology of Bones and Joints.—By JAMES F. BRAILSFORD, M.D., F.R.C.P., 3rd edition, with 404 illustrations: London: J. & A. Churchill, Ltd. (1944 edition).

Most of the lesions of bones and joints produce a characteristic radiographic picture and the more complete our knowledge of the normal and of the changes due to heredity, environments, diseases, etc., the more readily shall we be able to anticipate their nature and apply efficient remedial measures with the minimum of distress to the unfortunate patient and with the maximum of hope of success. Mr. Brailsford's book which has been the result of study of 25 years, devoted to this special subject, helps

in this problem to a very great extent. Apart from setting forth concisely an account of the bone changes in health and disease, this book indicates the significance of the radiological findings, and presents briefly the recent advances in the subject. In this third edition, particular attention has been paid to the changes in bones and joints resulting from trauma, the osseous dystrophies, tuberculosis, syphilis and neoplasm. Though the book is devoted almost exclusively to bones and joints the significance of certain other structures in the soft tissues which by virtue of their relative densities obscure important details or confuse the picture is considered. There is a very excellent bibliography at the end of the book. The X-ray photographs and the line drawings are very illustrative. We are of the opinion that it is a very authoritative work on the subject.

Correspondence

**Acute Obstruction by Faecal Mass,
Mistaken for Strangulated Hernia**

To The Editors, THE ANTISEPTIC, Madras.
Dear Sirs,

With reference to the case notes by Dr. Sinha in your issue of July 1944 on page 461, I would like to mention a few points about the diagnosis of the case.

(1) As nothing has been said about the right sided inguinal hernia except its mere presence and the fact that the patient used to wear a truss, one could easily presume that no complication of that hernia had been found by the author and that no abnormal changes had been observed by him over the site of that hernia. The mere presence of a hernia with symptom of acute intestinal obstruction is not sufficient to diagnose strangulated hernia. It is true that if a patient who happens to have a hernia gets acute intestinal obstruction from some other cause, as the abdomen distends, the hernia will fill up with distended bowel and get larger. But in strangulated hernia, it gets larger, tender, painful, tense, irreducible and loses its former impulse on coughing. It is almost a dictum that no hernia which is not hard and tense, is strangulated. From the absence of the

signs, one could conclude that it was not a case of strangulated hernia.

(2) The 2nd point is whether it was an obstruction of the small intestine or the large gut. Though early vomiting is more a sign of obstruction of small intestine, early abdominal distension is much more suggestive of obstruction of the large gut as obstruction of the small intestine rarely shows more than perhaps a suggestive fullness in those early stages. Now the common causes of a large gut obstruction are volvulus (most commonly of pelvic colon) and malignant growth. The former is diagnosed by the extreme rapidity and amount of distension specially on the left side of abdomen and the fact that vomiting and collapse are not marked features. In the latter, a previous history of vague abdominal pain, increasing constipation or a history of alternate constipation and diarrhoea and rectal examination would help.

Although I do realise the difficulties of the author in handling the case, I feel that the above points would have guided him to some extent in diagnosing the case.

Yours faithfully,
K. K. BAJAJ, M.B., B.S.,
Rampart Row,
Karachi, }
15-12-44. }

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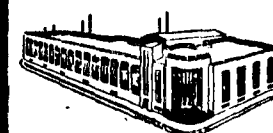
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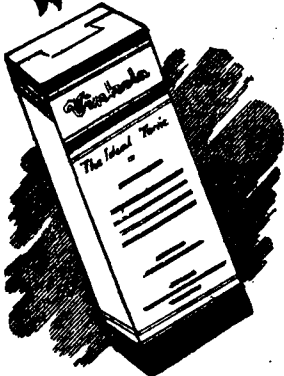
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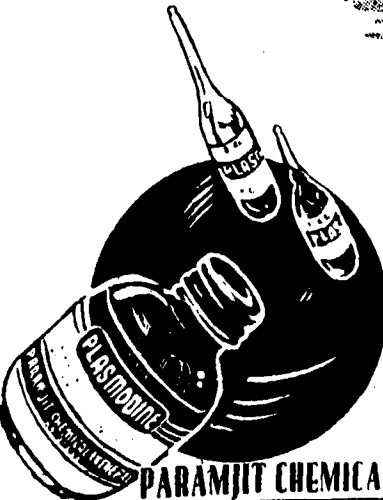
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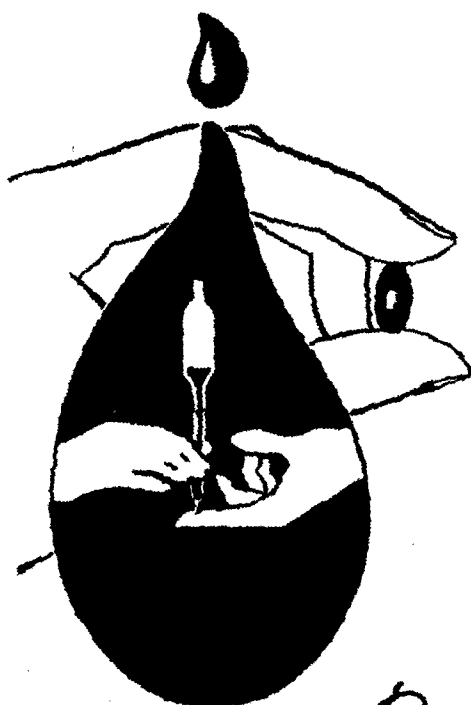
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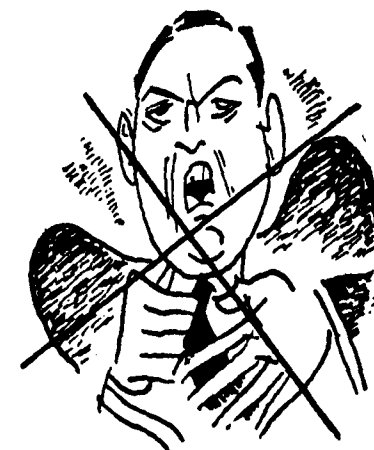
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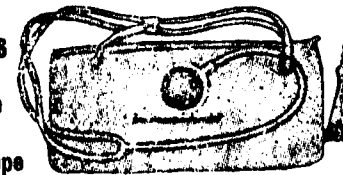
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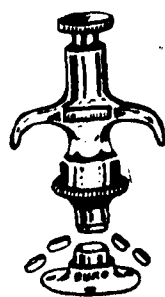
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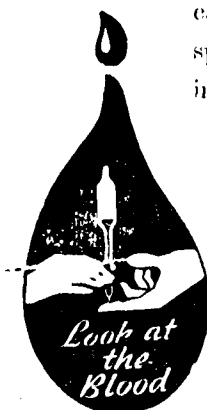
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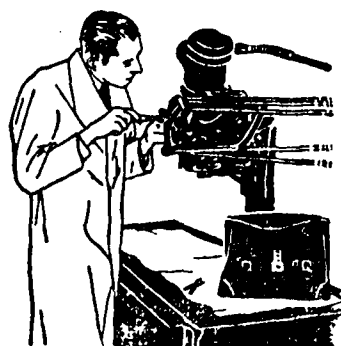
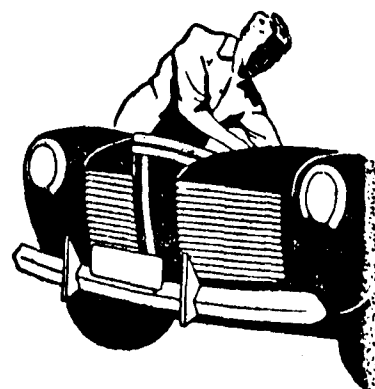
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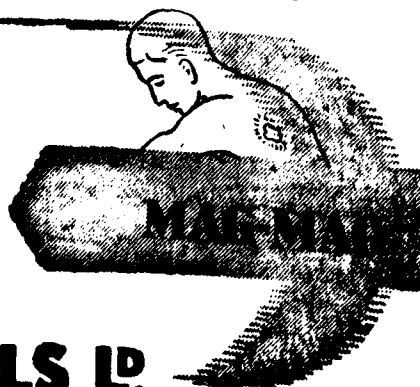


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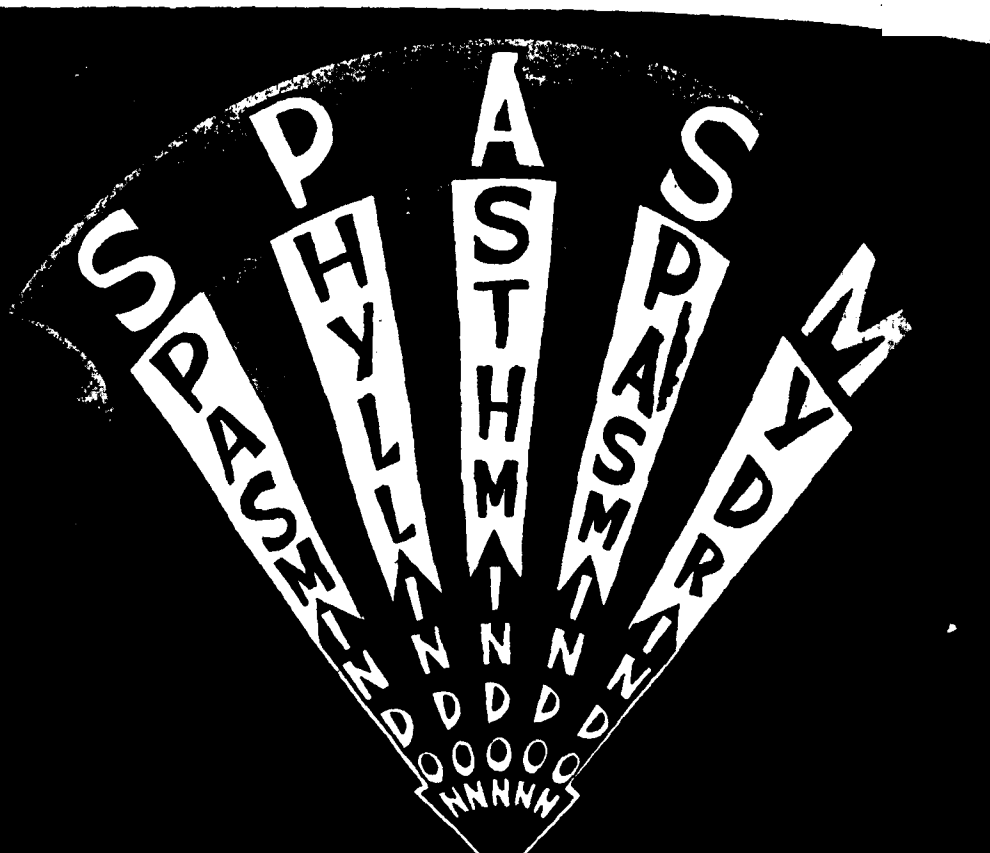
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Urethane q. s.

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(a) Ferarchin stops malarial fever even in cases where oral administration and injections of quinine bi-hydrochlor fail.

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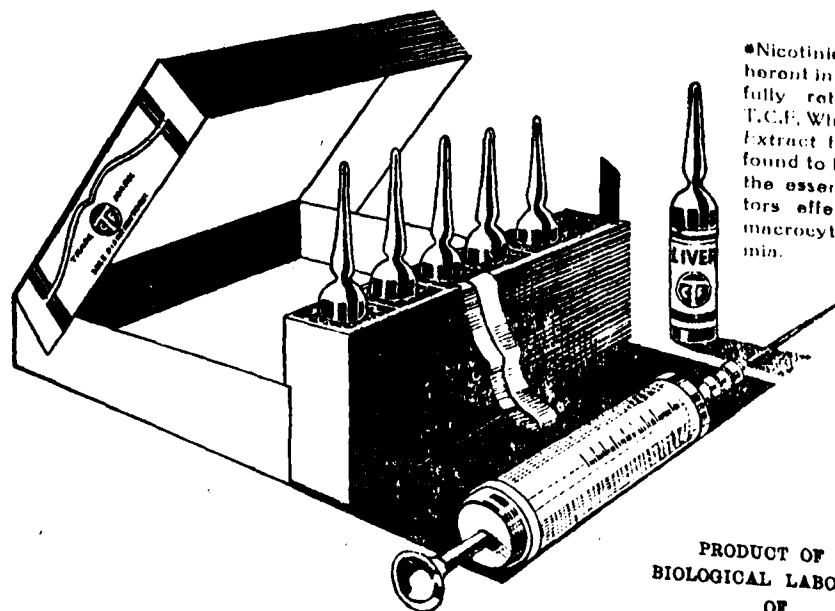
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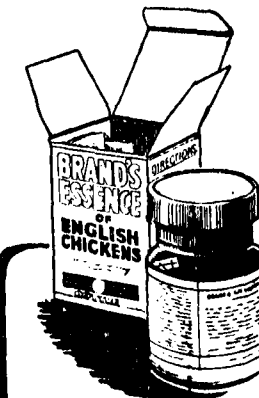
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The Antiseptic

ESTD. 1904.

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Vol. 42.

FEBRUARY, 1948

No. 2.

Original Articles

Penicillin*

K. U. JHATAKIA, M.D., (Bom.),

Tutor in Medicine, B. J. Medical School, and

Asst. to Physician, Sassoon Hospitals, Poona.

I. Introduction.—The dawn of the chemotherapeutic era dates back to the day of salvation of the syphilitic by Salvarsan. From Salvarsan to Sulphanamide, that is from 606 to 693, the progress has been very slow, while the progress from Prontosil to Penicillin, on the other hand, has been prompt. Penicillin is no pronoun to Prontosil, but it professes to be protagonist in the drama of bacterial chemotherapeutics. It is unfortunate that the period from FLEMING to FLOREY should be a prolonged one—about 12 years.

Penicillin is a potent anti-bacterial substance which is obtained from the culture fluid of the mould "Penicilium Notatum." It was born at St. Mary's Hospital in London. It happened one day in 1929, when FLEMING was engaged in a bacteriological research on staphylococci, that a mould drifted and had grown on one of the culture plates, and, strange enough, he found that bacteriological colonies in its vicinity were fading away. As he was interested in antiseptics, he took special notice of this and further observed that the crude culture of fluid in which the mould had grown was strongly anti-bacterial and non-toxic to animals and to human leucocytes.

Penicillin would have been lost to therapeutics at least for a considerable time but for the fine work by FLOREY and his colleagues at Oxford, which resulted in the release of an excellent chemotherapeutic agent, which inhibits the growth of susceptible bacteria in very high dilutions without any toxicity to tissues and with unimpaired action by serum, blood, and pus, thus serving as one of the most ideal antiseptics.

Penicillin has become so widely known with the publicity given to it during the treatment of some world-famous persons. It has a special interest largely because of the panorama, the popular press has spread

* Specially contributed to THE ANTISEPTIC.

before the public, not much unlike the pre-release news of well-known "Film" under production.

II. Pharmacology.—1. *Formula*:—The probable formula as suggested at present is either $C_{14}H_{19}NO_6$ or $C_{14}H_{17}NO_6HO_2$. However, the exact chemical nature is still not clear.

2. *Properties of the drug*:—(a) It is a strong organic acid; (b) it is freely soluble in water, ether acetone, etc.; (c) in its free acid form it is hygroscopic and loses its potency soon; (d) it is stable in dried form and in its other salt form if kept under $10^\circ C$. temp.; (e) it forms soluble salts with alkalies and alkaline earths; (f) in watery solution it is most stable at pH 5.7 and loses its potency if pH is changed; (g) sodium salt is less stable and more hygroscopic than calcium salt; (h) it is decomposed by other acids, alkalies, alcohol, metals and on heating; (i) it is oxidised by H_2O_2 and $KMnO_4$; (j) it is inactivated by an enzyme called "Penicillinase" derived from certain bacteria; (k) its potency is not affected by the presence of serum, pus or blood and is non-toxic to cells; (l) solution form of the drug loses its potency to a great extent within 48 hours even if it is kept under $10^\circ C$.

3. *Assay of "Unit"*:—An Oxford unit (or a Florey unit) is defined as "that amount of Penicillin which when dissolved in 50 c.c. of meat extract broth just inhibits completely the growth of the test strain of staphylococcus aureus." "Potency of a unit is such that '01 to '02 of a unit per c.c. inhibits the growth of 26 sensitive strains of staphylococcus."

4. *Salts of Penicillin*:—Many salts have been formed but therapeutically useful are at present two: (a) calcium salt; and (b) sodium salt.

(a) *Calcium salt*:—It is more stable but more irritative if given intramuscularly. It is chiefly used locally and also for intrathecal use.

(b) *Sodium salt*:—More difficult to prepare. It is less stable and hygroscopic. It is usually used for intramuscular and intravenous use.

5. *Mode of action*:—The action of Penicillin is bacteriostatic rather than bacteriocidal. The mode of action in such bacteriostatic drugs consists in interfering with certain essential metabolic process of bacteria, viz: (a) by oxidising a metabolic substance which has to be reduced in the process of bacterial nutrition; (b) by combining with the substrate or one of its constituents rendering it inactive for bacterial utilization; (c) by competing for an enzyme required by the bacteria for metabolic process; (d) by influencing its respiratory mechanism; and (e) by interfering with bacterial cell division.

But, out of all these, how exactly Penicillin produces its anti-bacterial action is not clear. Excepting staphylococci lysis of bacteria does not occur. Perhaps it renders the organism more easily susceptible to phagocytes, thus similar to sulphanamides, but Penicillin maintains its anti-bacterial action in the presence of blood-serum, pus or the products of protein decomposition substances, which completely annul the bacteriostatic action of sulfonamide drugs. Secondly, the action of Penicillin is only influenced to a minor extent by the number of bacteria to be inhibited, in contrast to sulfonamide. Thirdly, the resistance to sulfonamides is no indication of resistance to Penicillin, and, lastly, unlike the Sulfonamides the inhibitory action of Penicillin is not neutralised by para-amino benzoic acid, rather enhanced.

6. *Absorption*:—Penicillin is poorly absorbed after oral use both in man and animals due to its inactivation by the gastric acid. Human saliva, bile succus entericus have no inhibitory influence on Penicillin. This drug is to be given either by intramuscular or intravenous injections from where it is absorbed without being destroyed.

Absorption from rectum is also very poor.

(a) *Intramuscular injections*:—With I. M. injection within 2 minutes there is a definite rise in blood and reaches maximum within 10 minutes and remains at that level for 30 to 45 minutes and then gradually declines.

(b) *Intravenous injection*:—It is needless to say that it reaches to maximum within few seconds.

(c) *Intrathecal injection*:—From here it gradually passes into circulation.

(d) *From body cavities*:—Pleural—Joint sinuses. It is found that absorption from these places is very slow and much of the drug was recovered from here even after 20 hours in some cases.

7. *Distribution*:—In human beings Penicillin appears soon in peripheral blood, none in saliva, tears, or in cerebrospinal fluid. In general, average concentration found in erythrocytes was less than 10% of plasma concentration.

8. *Excretion*: It is mainly excreted in urine colouring it bright yellow. Average excretion in man by this route amounts to 60% of intravenous dose, whereas after oral, rectal and intraduodenal administration the respective amount excreted being 10, 12, and 16% of the dose given.

9. *Fate*:—By whatever route Penicillin is administered, not all the acute substance is secreted but some portion is evidently destroyed in body.

10. *Optimum concentration in blood*:—Optimum concentration necessary in blood for full therapeutic effect is 0.019 unit per c.c. of blood for maximum anti-bacterial effect against streptococci while 0.156 unit per c.c. against staphylococci. This standard is achieved by 10,000 to 20,000 units intramuscular or intravenous given every 4 hours.

11. *Action on bacteria*:—It has been found that gram positive bacteria are susceptible to Penicillin while most of gram negative bacteria are not sensitive to it except gonococci and meningococci. Staphylococci are most sensitive and their growth is prevented even in 1:1 million dilution.

Bacteria susceptible to Penicillin are:—(1) Staphylococci; (2) streptococci; (3) pneumococci; (4) gonococci; (5) meningococci; (6) clostridium group: (a) cl. welchi; (b) cl. deieliens; (c) cl. septique; (7) B. tetanus; (8) B. anthrax; (9) B. diphtheria; (10) actinomycosis, etc.

Bacteria which are least sensitive to Penicillin are:—(1) B. coli; (2) B. typhosus; (3) B. pyocyaneus; (4) B. proteus; (5) vitrio cholera; (6) B. dysenterica; (7) H. influenza; (8) B. tuberculosis, etc.

Besides these malarial parasites, viruses and other gram-negative bacilli are least sensitive to the drug. The drug has been useful to some extent in cases of syphilis, while its utility in cases of sub-acute bacterial endocarditis is still questionable. It is very unfortunate that bacillus tuberculosis and bacillus typhosus should prove insensitive to Penicillin.

III. Therapeutic aspects of the Penicillin.—Many human maladies come within the scope of Penicillin therapy and most of the major infections to be feared in the battle front are amenable to it.

As shown by statistical data, Penicillin is superior to any of the Sulfonamides in the treatment of staphylococcal infection with or without bacteræmia, including acute and chronic osteomyelitis, cellulitis, empyema and burns. It is also extremely effective in the treatment of gonococcal, pneumococcal and streptococcal hemolytic infections which are resistant to sulfonamide. In actinomycosis, the response has been variable while promising results are reported in cases of gas gangrene. Both of the venereal diseases also come within its scope.

In Penicillin, the physician finds a remarkable chemotherapeutic agent, while a surgeon sees in it the potentiate of a new agent with which to implement his orthodox operative procedures. It has helped the surgery a lot to achieve most wonderful results in war wounds, compound fractures, chronic sinuses and osteomyelitis.

Penicillin is no substitute for sound surgical or medical judgments, but dramatic results are expected when one combines the application of Penicillin with adequate surgery and other necessary therapeutic measures. One must see while using the Penicillin that: (1) the bacteria is sensitive to it; (2) it must be made available at the required site in an effective concentration throughout the treatment; (3) and also that nothing else comes in the way to prevent its maximum effect.

Summing up the chief indications of its use are:—(1) all staphylococcal infections, such as osteomyelitis, acute, chronic, carbuncles, meningitis, sinus thrombosis, wound infections, carbuncle of kidney, etc.; (2) all clostridia infections, such as gas gangrene, malignant œdema, etc.; (3) all hemolytic streptococcal infections such as septicæmia, cellulitis, empyema, mastoiditis, puerperal sepsis, peritonitis, etc.; (4) all pneumococcal infections of lungs, pleura, meninges, endocardium, peritoneum, etc.; (5) all gonococcal infections and complications such as arthritis, peritonitis, endocarditis, etc.; (6) it is useful also in syphilis and actinomycosis, anthrax, diphtheria and tetanus; (7) its utility is questionable in sub-acute bacterial endocarditis, liver abscess and infections of urinary tract; (8) it has been found effective in cases of impetigo, sycosisbarbæ, and dermatitis with secondary infections.

2. *Routes of administration*:—The impossibility at present to give Penicillin by mouth is its greatest drawback. Efforts have been made to give it by duodenal tube or in keratin coated capsules but the absorption is not uniform.

Rectal route has been tried but very little is absorbed.

However its solubility is an asset as it can be applied locally in various combinations and can be administered systemically. Thus we have only two routes of administration: (1) Systemical and (2) Local.

(1) *Systemic administration*:—By this route, Penicillin is given either continuously or intermittently; with continuous method, the level of Penicillin in the blood is constant, while with intermittent injections, there are peaks of high concentration of the drug in blood with intervals of low concentrations. It is difficult to say at present which is better, as both methods have been successful in treating the cases.

Intermittent method:—Injections are made into veins, muscles or subcutaneous tissues; the last one is painful. One does not like to puncture veins so often as it often produces thrombophlebitis and so intramuscular method is more widely used. Frequency of infections in this method is a

great disadvantage of it. A doctor or trained nurse is necessary. We hope some preparation of Penicillin, a suspension on oil or some of its ester etc., may soon come into existence so that a gradual continuous release of the drug may take place from it and repeated injections may have to be avoided.

Continuous method:—Penicillin is administered as a continuous drip either intravenously, or intramuscularly or subcutaneously. This is the best method where blood cultures are positive. Thrombophlebitis and pyrexial reactions are common with this method. Subcutaneous continuous drip does not give enough high concentration of drug into circulation and so useless in staphylococcal infection, where a high concentration is needed.

(2) *Local use*:—This method is very useful in local wounds, burns, sinuses, empyema, meningitis, joint cases, etc., where the drug can reach at injected site in optimum concentration and with full certainty.

3. *Pharmacy of the drug*:—Packings: Penicillin is supplied in powder form in various strengths of 5, 10, 25 and 100 thousand units per ampoule. The sodium salt is more widely used but now calcium salt is also getting popular. The powder is to be dissolved in saline or distilled water according to the strength necessary.

Storage:—Penicillin powder must be stored in refrigerator or a place under 10°C. temp. Hence the solution prepared must be used up within 48 hours of its preparation as most of the potency is lost even on keeping it in refrigerator. Recently a report states that if kept in ice-box the solution may retain its potency for about a month. We await confirmation by other workers.

Preparation of solutions, powders, creams etc.—

General use for intravenous therapy:—(1) It may be dissolved in normal saline so as 1 c.c. contains 1000 to 5000 units.

(2) It may be dissolved in normal saline with 5% Glucose for continuous drip method. One c.c. containing 25 to 50 units. Total fluid given is 1 to 2 litres. Rate is usually 30 to 40 drops a minute.

(3) It may be dissolved with whole blood or plasma. One pint containing 30,000 units, higher strengths may be necessary in more fulminating cases.

For intramuscular therapy:—It is dissolved in normal saline. One c.c. containing 5,000 to 10,000 units; usual dose is about 15,000 units every 4 hours.

For subcutaneous drip:—Total daily dose is dissolved in 1 to 2 litres of normal saline; usual rate is 10 to 20 drops a minute.

Local use:—For tropical use into theca and other cavities.—

(1) *For intrathecal use*:—Solutions are prepared in normal saline, 1 c.c. containing 1,000 units; usual dose is 10 c.c. of this fluid once in 12 hrs.

(2) *For empyema cavities etc.*:—Solutions are to be prepared in normal saline, one c.c. of solution containing 5,000 units; solutions are to be retained in cavity and mere irrigation of cavity with the solution is quite useless. Some solution is used in joint cavities, abscess cavities etc. In certain abscess the strength advised is 1,000 units per c.c. For simple abscess cavities, sinuses, and breast abscess, solution may be prepared in Aqua Distillata, one c.c. containing 250 to 100 units.

(3) *For surface application*:—Penicillin is used either as solution, powder, insufflation cream paste or unguentum.

Powder:—Calcium Penicillin is used mixed with Sulfonamide, so one gram of mixture contains 500 to 5,000 units. This powder is used for insufflation in burns, wounds, nose, etc.

Cream:—This preparation is much useful in burns. Various types are prepared as follows:—(a) Lanet wax Sx., paraffin, water, all equal parts; (b) Lanet wax Sx. 12 parts, Arachis oil 25 parts, water 55 parts; (c) Lanet wax Sx., water, equal parts.

Penicillin is so added that one gram of cream contains 200 to 400 units. When this cream is applied to surface, it gives a concentration of 4 to 8 units per sq. c.m. It is to be applied once a day.

Paste:—Lanet wax 50 parts, castor oil 120 parts, water 75 parts.

Penicillin added so as 1 gm. contains 200 to 400 units.

(4) **Eye drops**:—Penicillin dissolved in Normal Saline so as one c.c. contains 500 units. One drop in the eye one hourly on first day, 2 hourly on second day and 4 hourly on third day.

(5) **Eye ointment**:—Penicillin mixed with vaseline or other base 500 to 800 units per c.c. of mixture.

4. **Dosage**:—Establishment of a correct dosage is a problem of great complexity at present. However after trials and errors, it has been fixed that the daily dose should be 1,000 units per lb. of body weight. Total maximum dose in all is still a problem to be settled, still it is worth remembering that an overdose, although of no terror, an underdose is a real danger.

Average dosage advocated by Dawson and Hobby are as follows:

(1) **Staphylococcal infections**:—(a) acute osteomyelitis: 10,000 to 15,000 units 4 hourly intramuscularly for seven days; (b) chronic osteomyelitis 20,000 units 4 hourly intramuscularly along with surgical treatment; (c) staphylococcal urinary infections: 10,000 to 16,000 units 4 hourly intramuscularly for 5 days; (d) empyema, meningitis, arthritis, etc.: 20,000 units daily once locally along with general intramuscular method for two days; (e) compound fractures: 100,000 units daily by intramuscular route for 8 days.

(2) **Pneumococcal infections**:—(a) Pneumonia: 10,000 units hourly intramuscular for 10 injections. In some it may have to be given for 2 days; (b) empyema: 20,000 units intrapleurally in 30 to 40 c.c. Saline once in 48 hours 3 to 4 times. Systemic administration may also be given; (c) meningitis: 20,000 units intrathecally daily once, 2 to 3 times enough. Intramuscular administration may also be given.

(3) **Streptococcal infections**:—(a) Septicæmia: 10,000 to 20,000 units 4 hourly intramuscular for 5 days. Streptococcal viridans is most resistant to Penicillin.

(4) **Meningococcal infections**:—Meningitis: 20,000 units intrathecally daily for 2 to 3 days along with systemic route.

(5) **Gonococcal infections**: (a) Blood stream and acute urinary infections: 10,000 to 15,000 units 4 hourly intramuscular for 2 days. In serious cases continue for 2 days more after the temperature has come to normal; (b) acute arthritis: 10,000 units daily intra-articularly for 2 to 3 days.

(6) In all other miscellaneous infections usual dose is 10,000 to 15,000 units 4 hourly for 3 to 4 days according to the severity of infection.

(5) **Toxic reactions**:—The following reactions have been observed: (a) Burning pain at the site of injection; (b) rigor with or without fever; (c) headache; (d) faintness; (e) flushing of the face; (f) unpleasant taste in the mouth; (g) muscle cramps; (h) tingling sense in the testis; (i) thrombophlebitis; (j) eosinophilia; (k) urticaria; (l) transient azotemia.

Most of these are supposed to be due to some impurities in the drug. The last four reactions were constant in many cases with different batches of the drug and so may be attributed to the drug itself. Some cases have been reported developing features analogous to serum sickness. The complications may occur any day between 1 and 28 days of treatment.

IV. Conclusion.—As we have observed, Penicillin is remarkably effective in certain infections with least toxic reactions, the virtue perhaps no other drug possesses in our materia medica. Still the drawbacks of the drug, though few, are big enough deserving a note.

They are: (1) It cannot be used by oral route. (2) Its preparations are unstable at room temperature and loses its potency very rapidly. So they must be used up very soon after its manufacture.

These two principal drawbacks are the chief handicaps to us, poor Indians, who have to depend for all such on foreign countries. As the drug gets deteriorated on longer standing, it should be swiftly transported to the destinations under special care and precautions, which ultimately increased the cost a lot, and the drug cannot be made available at all places because of its difficulty in storage. Secondly, the patient has to receive the drug by frequent injections which also makes the treatment much expensive in private. Thus the treatment with Penicillin in private and in hospital, specially in cases who cannot afford much, is a very difficult problem. It is very essential that this problem should be solved soon. Our dependence on foreign medicines and basic chemicals is deplorable. We have suffered a lot during these war days due to it. Fortunately no basic chemicals are necessary in Penicillin production, except the materials for extraction and purification. India is often described as a 'Vast Arsenal' by many eminent persons of India, and we hope our energetic industrialists may take up this problem in right earnest and may start plans for production of Penicillin on a large scale so that this magnificent drug may be soon made available as cheap as possible to all the suffering poors of India.

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Inanition Cases*

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THIS article is based on the clinical findings of a male ward of a 100 bedded Military Hospital (Famine Relief) in Bengal; since there were no facilities for any laboratory tests whatsoever except the heat test for albumin and Napier's Serum test and Globulin precipitation test for Kala Azar, an accurate scientific study was not possible; complete and detailed past history of each patient was recorded and it is superfluous to give here the history of each patient that led to their miserable circumstances.

Out of 374 cases treated in the male ward, 173 were admitted mainly for inanition and the rest for diseases with varying degrees of under-nutrition. This article is from the observation of these 173 cases, whose predominating disease was inanition, though uncomplicated cases of pure inanition was very rare.

Starvation produces two types of inanition:—

I. Oedematous; II. Dehydrated.

TABLE NO. 1.

Types of cases	No. of cases treated	Deaths	Percentage
Inanition ...	173	26	14.2
(a) Oedematous ...	114	22	19.3
(b) Dehydrated ...	59	4	6.8
Other diseases ...	201	17	8.4
Total ...	374	43	11.5

I. Oedematous type.—Almost all these belong to skilled labouring class, i.e., masons, carpenters, black-smiths, agriculturists, fishermen, etc., and majority were formerly well-built, fairly nourished individuals. From their history it is found that their having varying degrees of under nutrition—from 4 months up to 2 years and their oedema is of gradual onset. For convenience of this article, these cases are divided into three groups:—

GROUP I:—Cases with generalised anasarca (ascitis and rarely with hydrothorax) and brought in a state of collapse.

GROUP II:—Moderate oedema in the lower and upper extremities.

GROUP III:—Only slight oedema at the ankles and feet.

Group I and Group II are bed-ridden.

Symptoms.—The patient may be apathetic, anxious looking and talk slowly. He complains of loss of appetite, heaviness in the head and legs and complains of loose motions, especially at nights. His muscles are flabby and the diarrhoeic stools are watery, yellowish in colour, without any mucous or blood. All the above symptoms or either one of them are present according to the severity of the cases.

The only constant physical sign worth mentioning is a feeble first sound in all areas—some times heart sounds are inaudible—sometimes by careful examination only heart sounds are heard; the pulse is slow usually below 60 and of a poor volume and in Group I cases, it is imperceptible at

* Specially contributed to THE ANTISEPTIC.

the wrist. Sometimes some patients used to have tenderness over the whole body. There may be loss of deep reflexes in some cases. The temperature is always subnormal.

Urine was examined in all cases and there was no albumin present, except in one case in which there was a trace of albumin on repeated examination.

II. Dehydrated type.—This forms 34.1 per cent. of inanition cases. The patients are mostly beggars and give history of acute starvation of short duration, without any food whatsoever for 5 to 10 days. He staggers to hospital; he is listless and sometimes very irritable. His eyes are sunken, lustreless and has a cadaverous look in him. His skin is dry and inelastic and there is considerable wasting of muscles. These patients used to have ravenous appetite without any diarrhoea. In these cases also the only physical sign is feeble heart sounds, especially first sound in all areas; but the pulse is rapid—80 to 90 per minute and of very poor volume. The temperature is sub-normal.

There is no albumin in the urine in any case.

From the above observation, it will be seen that chronic starvation leads to oedematous type which may be a compensatory mechanism and acute starvation leads to dehydrated type. Perhaps the difference in kidney threshold for biochemical constituents of blood, especially sodium and calcium in different individuals, may be an important determining factor.

Prognosis.—This depends on age, loss of appetite, presence of diarrhoea and any inter-current diseases showing signs and symptoms at the time of admission. The prognosis gets bad as the age advances, especially in oedematous type; it is definitely worse after 60 years; but a child under 4 years with extreme dehydration is not hopeful. Loss of appetite is definitely of very bad prognostic significance and this symptom is found only in oedematous type; whereas the dehydrated type always has a ravenous appetite and a very low death rate, as shown in Table I. Generally, the prognosis of a patient by this one symptom could be judged correctly. Diarrhoea, except in children and patients under 20, is a dreaded symptom. The usual inanition diarrhoea is of a pale, yellowish (sometimes slightly greenish tinge) colour, watery and several times in 24 hours, especially at nights without any blood or mucous. This is found only in oedematous type and is sometimes intractable—intercurrent disease. In extreme starvation almost all other diseases are latent and do not produce any signs or symptoms. But there are cases of acute diseases with signs and symptoms complicating inanition and which surely take the patient away; latent diseases flare up as the patient improves and early and energetic treatment is absolutely necessary.

In dehydrated cases sometimes it is very difficult to know the prognosis—in these cases sudden heart failure is the most common cause of death and out of 4 deaths in this series, 3 died of heart failure suddenly after 2 or 3 days on admission when patients were taking liberal fluid diet and showing signs of marked improvement. Perhaps a latent myocarditis flared up by the nourishment, caused the sudden heart failure, or an increase in potassium ions in blood, due to increased permeability, might be the cause of heart failure.

Treatment.—Three main objects to be always considered in the treatment of inanition are rest, warmth and effective and early nourishment.

Group I and Group II, the œdematous type are bedridden, but rest has to be enforced when they are improving rapidly and try to get up and walk. Group III of the œdematous type are walking cases, and as their diet is of a convalescent type of high caloric value from the beginning so unnecessary restrictions to bed are not only not essential, but definitely harmful. In the dehydrated type, absolute rest in bed must be endorsed since sudden heart failure is very common in this series. These cases are able to walk slowly and the majority are irritable, so absolute rest will have to be enforced by means of putting them in sheets.

Warmth to starvation cases is essential. In Bengal, at a place of sea level, at least 4 woollen army blankets were necessary for each patient (2 below and 2 above) to keep the patient free from cold.

Effective and early nourishment:—This comprises dietetic, parental therapy, vitamins and other medicines; there are no rigid rules regarding these as each case is an entity by itself, and from past experience the following observations are made:

Dietetic:—There were three separate kinds of diet in use (1) Milk diet—This consists of 2 pints of milk, 4 ozs. of sugar, 1 oz. of barley and 1 orange a day for each patient. (2) Milk rice (salt free)—This consists of 1 pint of milk, 1 lb. of rice, 4 ozs. of sugar and 1 orange a day for each patient. (3) Gruel diet (convalescent diet)—This consists of 1 pint of milk, 1½ lbs. of rice, ½ oz. of salt, 4 ozs. of dhall, 2 ozs. of sugar, 2 ozs. of vegetables, 4 ozs. of fish and one orange a day for each patient.

In addition to the above, Glucose water and butter-milk were supplied according to the patient's condition.

Diet:—In œdematous type, it was found that patient under 20 even with generalised anasarca and inanition diarrhœa, if he has a good appetite, he can be straightaway put on the gruel diet with some mild astringent mixture, such as mixture Creta 1 oz. t.d.s. and these patients improve rapidly. Their average stay in the hospital was 22 days. Patients under 20 with loss of appetite but with diarrhœa and generalised anasarca—(Group I cases) have to be dieted in an entirely different way; they must be put on milk diet till they get good appetite, i.e., an average for 3 days, then change to milk rice diet for 4 days, and then only they can be put to gruel diet. These patients' average stay in hospital was 25 days. In older patients of Group I, since they cannot retain even milk, they have to be fed only on orange juice, till they are able to retain milk, and then very gradually improvement of the patient. Generally an average of 2 days with Glucose water and orange juice, milk diet for 2 days and milk rice for a week will suffice to put these patients to gruel diet. From Table No. 1, it will be noticed that mortality is highest in this series and a hurry in increasing the diet will further damage the digestive and absorptive power and will worsen the diarrhœa, which is sure to prove fatal. Some of these patients require nasal feeding for the first 2 days. For Group II cases (in which majority will have a moderate appetite without diarrhœa) it is better to put on milk rice diet for a week and then change to gruel diet. Group III cases, we can straightaway put them to gruel diet.

Diet in dehydrated type:—These patients are benefited best by a milk diet for 2 days and then to gruel for the rest of their stay. Patients under 10 in this series may often require nasal feeding and in that case milk diet is continued for 2 more days, and then only they are put to gruel diet in

small quantity. These patients improve rapidly and their average stay in hospital was 14 days.

Medicine:—This consists of Glucose Peptone, Glucose Saline, Vitamins, Calcium, Iron and Liver Extracts.

Glucose Peptone:—This is a protein hydrolysate, the end product of digestion of meat with unactivated pepsin and consists of a mixture of peptones, polypeptides and amino acids free from precipitinogens and anaphylactinogens and supplied by the All-India Institute of Hygiene and Public Health, Calcutta. It contains 5 grams of protein hydrolysate by dry weight, 5 grams of Glucose and 0.9 grams of Sodium Chloride in 100 c.c. and is supplied in bottles containing 200 c.c.; it is of a clear port wine colour free from any precipitate of turbidity and has a pleasant odour.

Administration of this protein restores the depleted blood of the much-needed nutrition effectively and quickly and hence is based on sound scientific premises; it is given intravenously as any other intravenous infusion, and administration of this protein which can be visible within 12 hours further benefits the patient psychologically.

For Group I cases 400 c.c. for 4 consecutive days are needed to tide over the collapse and for Group II cases 200 c.c. on 2 consecutive days suffices; this was not tried on Group III cases due to limited supply and further for Group III other dietetic and vitamin treatment are only needed. For extreme collapsed cases, i.e., in Group I, uncomplicated with other diseases, Glucose Peptone has reduced the mortality by at least 70 per cent. and its use has reduced hospitalisation in Group II cases by at least 10 days.

Only mild reactions such as cough, chill and shivering, giddiness, and occasionally feeling of intense heat in the head, were present.

Contra-indication to its use is nephritis and hence before its administration urine should be examined for albumin and casts; serious consequences will occur by its use if the sample is turbid or contains precipitate, is foul smelling and this must be looked for if, when opening the ampoule, no sound due to entry of air is heard.

TABLE NO. 2.

Type	No. of cases treated	No. of deaths	Percentage	No. of treated with Glucose Peptone	No. of deaths in Glucose Peptone
Group I	52	16	30.8	36	7
" II	37	5	13.5	2	2
" III	25	1*	4.1	1	1

* Died of cerebral malaria on 8th day of admission.

Glucose Saline:—This has been found to be of no use in œdematous cases; whereas immediate administration of Glucose Saline (5 per cent Glucose in Saline supplied by Crook's Laboratories in a convenient 1 pint ampoule) will turn the picture dramatically in dehydrated type; for these patients two pints are given in 12 hours, the first pint should be given rapidly. For patients over 12 years in dehydrated type, it should be repeated for 3 days.

Vitamins:—Since avitaminosis is marked in all cases it should be given liberally to every case, especially vitamin "B" Complex in œdematous type. Vitamin "B" is found to reduce the œdema considerably. Multivite

tablets (each tablet contains Thiamin Hydrochloride 1 mgm., Riboflavin 1 mgm., Nicotinic Acid 10 mgm. and Ascorbic Acid 25 mgm.) for Group I cases 3 tablets four times a day. Group II cases, 3 tablets t.d.s., and Group III and dehydrated type 2 tablets t.d.s. are needed.

Calcium, iron and liver:—These should be given to hasten recovery in appropriate cases. There is considerable evidence to show that Calcium does benefit very much in cases where muscle wasting is marked; it is given as Calcium Lactate 30 grains t.d.s. or Calcium Gluconate of 5 c.c. 10 per cent. I. V. and this has reduced hospitalisation very much. Iron, if necessary, supplemented with liver extract, should be given to anaemic cases. Hæmosan or Ferolet 1 tablet t.d.s. and Liver Extract 2 c.c. I.M. daily for a week have given satisfactory results.

Since inanition is almost always complicated with inter-current diseases, such as malaria, dysentery and kala-azar and which may be latent in them, but which flares up as the patient gets nourishment, constant and careful watch should be kept and early and energetic treatment should be given.

The above is a bare outline of starvation cases and the theoretical side has been left out.

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Indian Village Obstetric Emergencies

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(Continued from page 36 of Jan. 1945 issue).

Chapter XVII.

Operations for Improving the Position of the Presentation

1. Bimanual rotation of the occiput in persistent transverse and posterior positions (i.e., where there is undue delay or where the occiput has rotated into the hollow of the sacrum. But where there is more than slight disproportion endeavour to get the patient to hospital as an alternative to craniotomy and embryotomy).

A. GENERAL REMARKS.—1. Most cases of occipito-transverse and of occipito-posterior positions, provided the uterine contractions are good and ample time is given, rotate spontaneously. Such cases are usually due to minor degrees of disproportion and they are often encountered in primiparæ. Where the contractions require stimulating remember the value of 10 mg. to 16 mg. Morphine s.c. (1/6 to 1/4 grain) according to the weight of the patient. The dose may have to be repeated every 6 to 8 hours.

2. Where the uterine contractions remain weak, and/or the head remains high, and/or the membranes are intact, there will be little if any caput formation. Diagnosis must be made by abdominal palpation to avoid risk of rupturing the membranes. Only in case of doubt may combined abdominal and vaginal and/or rectal examination be employed. The external fingers must feel for the chin above the pubes while the internal fingers investigate the sutures and fontanelles.

In such a case one can easily feel the sutures and fontanelles even through the thinned out cervical tissue, provided the cervix is taken up, despite the external "os" being hardly dilated. Difficulty is experienced where the uterine contractions are insufficient to obliterate the cervical canal.

Where one discovers that the four cornered fontanelle, with the four sutures which join it, is nearer to the pubes than it is to the sacrum, while the triangular fontanelle, with its three junctional sutures, is with difficulty found in the neighbourhood of the sacrum, the position is occipito-posterior. Where the four cornered fontanelle is more easily felt than the triangular fontanelle, the head is not sufficiently flexed.

3. Where the head has descended into the pelvis, and/or the uterine contractions are strong, especially if the membranes have been ruptured for some hours, there is likely to be considerable caput formation which may obscure the fontanelles and sutures. If such should be the case, the diagnosis must be made by introducing, under full antiseptic ritual, the index and middle finger of one hand, or, if necessary, all the fingers and the whole hand into the vagina until the posterior ear of the foetus can be felt. The occiput lies in the direction in which the pinna and helix of the ear point. Feeling for the posterior ear at times produces spontaneous rotation of the occiput and the operator must not fail to notice this fact.

While the internal fingers are investigating the posterior ear the external fingers must feel for the chin which in occipito-posterior positions is palpable above the pubes.

4. As long as the membranes remain intact (a) avoid interference, (b) give Morphine especially at night, and (c) where the position is "R.O.P." or "R.O.T." keep the patient in the left Sims' posture.

Where the position is "L.O.P." or "L.O.T." keep the patient in right Sims' posture.

5. Where the membranes are ruptured and the external "os" admits a hand podalic version [see contra-indications, and conditions, Chapter XVIII (III) and (IV)], or bimanual rotation must be attempted as soon as four hours with the patient in the squatting posture and strong uterine contractions have failed to produce spontaneous anterior rotation provided the child is alive and the integrity of the uterus is not endangered.

6. Where the uterine contractions are poor wait 24 hours after rupture of the membranes, giving Morphine eight hourly before attempting podalic version [Chapter XVIII (III) and (IV)] or bimanual rotation, whichever is safer and easier, provided the child is alive. Where it appears that the uterus, the mother and the foetus will stand the strain, and/or where the external "os" is not fully dilated podalic version coupled with the drawing out of one or both ankles is the operation of choice. Podalic version is usually preferable before the parietal bosses have engaged in the pelvic brim; bimanual rotation is usually preferable after engagement. When podalic version or bimanual rotation fails or the child is dead craniotomy must be carried out at once.

7. Where the occiput rotates into the hollow of the sacrum and the child is in good condition bimanual rotation must be attempted immediately. When bimanual rotation fails, unless the child is premature, craniotomy must be carried out. Where the child is premature it will be born as a "P.O.P."

either spontaneously or with forceps assistance, but even here if it appears that the perineum will be badly torn there should be no hesitation in performing craniotomy unless one is prepared to make a deep episiotomy and feels competent to repair it.

8. Where the head remains high and the external "os" refuses to dilate after the membranes have ruptured one must pack the "os" with sterile gauze or cloth soaked in flavine-glycerine until the "os" is large enough for podalic version and drawing out an ankle, craniotomy or the application of Willett's forceps. By means of a tape exert slight weight traction on the handles of the cranioclast or Willett's forceps. Where Willett's forceps are employed bimanual rotation or craniotomy will probably be required subsequently when the "os" dilates sufficiently and podalic version is unsuitable.

9. Success in obtaining and in maintaining an anterior position of the occiput depends upon the skill of the operator in turning the foetal back as well as the occiput to the front. Where the foetal back cannot be brought to the front it is essential to prevent the occiput from reverting to its previous transverse or posterior position:—

(a) Where the external "os" is not fully dilated, or the parietal bones are above the level of the ischial spines, this must be done by the application of one or two pairs of Willett's forceps to the foetal scalp and a light weight must be attached to a tape, passing over the foot of the bed, from the handles.

(b) Where the cervix is obliterated and the external "os" fully dilated, the obstetric forceps must be applied provided the parietal bosses have reached the level of the ischial spines. Here the unrotated head has been delayed and most of the liquor amnii has drained away (which is the usual state of affairs found as long as untrained "midwives" remain in almost universal employment) the head can usually be rotated manually but it is almost impossible to rotate the trunk. The result is that, as soon as the pressure of the internal hand is removed, the occiput reverts to its previous transverse or posterior position. In a case of this description, when the membranes have been ruptured about 24 hours, perform craniotomy. Where by chance a case of this description is seen early the blades of the obstetric forceps may be applied after the internal fingers have rotated the occiput as far forward as possible and before the fingers are removed from their grip on the head and tentative traction applied cautiously. When forceps delivery fails one may perforate the head before removing the blades of the forceps. This may enable the obstetric forceps to draw out, very gently of course, the contracted head without having resort to the cranioclast, but beware of the forceps slipping and causing damage to the maternal soft parts.

(c) If the parietal bosses are above the ischial spines podalic version [see Chapter XVIII (III) and (IV)] followed by the drawing out of one ankle or two ankles should be attempted, being easier than the high forceps operation, before resorting to craniotomy.

10. Where difficulty is experienced or expected in effecting bimanual rotation MONRO KERR advocates placing the patient in the left Sims' posture when the position of the head is "R.O.P." or "R.O.T.", or in the right Sim's posture when the position is "L.O.P." or "L.O.T." during the performance of the operation.

11. Deep anaesthesia, to a surgical degree, is of great help and is usually essential in dealing with a difficult case, especially in a primipara.

12. Where Sims' posture has been employed during the operation, as soon as it is decided that the occiput will remain in an anterior position, the patient may be turned into the dorsal posture or better she should be encouraged to squat.

13. After podalic version or bimanual rotation have been achieved, where there are no indications for immediate delivery, and/or the conditions for the application of the obstetric forceps are not satisfied, leave the case to nature as long as possible, but, unless delivery is imminent, perform craniotomy when the membranes have been ruptured about 24 hours or so.

14. Each case of "P.O.P." position, where there is delay, requires careful consideration.

The situation must be assessed:—

- (a) Before the parietal bosses are engaged in the brim of the pelvis.
- (b) When the parietal bosses have entered the pelvic brim but have failed to reach the level of the ischial spines.
- (c) After the parietal bosses have descended below the level of the spines of the ischium.

15. Before the parietal bosses are engaged there are three alternatives to bimanual rotation: (a) podalic version; (b) application of Willett's forceps; and (c) craniotomy.

If there is no more than slight disproportion, while the membranes are intact, no manipulations must be undertaken.

Delay is more likely to be due to uterine inertia, secondary to under development of the uterus and of the pelvis. Unless the cause of the inertia can be overcome or unless Willett's forceps are available for attachment to the foetal scalp as soon as the occiput is rotated to an anterior position, the parietal bosses will still fail to engage in the pelvic brim even after bimanual rotation.

Delay must not be attributed to the "P.O.P." position unless good uterine contractions are present or have been in action, for a reasonable length of time. If the inertia of the uterus can be overcome the natural forces of themselves should be able to rotate any normal foetus, during descent, into an occiput-anterior position, provided the pelvis is not too small for the size of the head.

Such a case is extremely perplexing and intricate. A wise medical attendant will send a case of this type to hospital, as soon as diagnosed, or call in a consultant of repute, if at all possible.

16. When the parietal bosses have entered the brim of the pelvis but have failed to reach the level of the ischial spines the common cause of the trouble is a generally contracted (small round) pelvis or a post mature head and uterine contractions which are only of moderate strength (again suspect slight under development).

It is this type of case which leads to the death or disablement of many young and attractive mothers from general exhaustion, from sloughing of the vagina, from sepsis, from vesico-vaginal and recto-vaginal fistulae, or occasionally even from rupture of the uterus.

As long as the membranes remain intact do not interfere but give

Morphine. If it appears probable that nature alone will effect descent and rotation wait for about 24 hours after the membranes have ruptured, still giving Morphine, unless the patient is becoming exhausted, before interfering.

If seen while the uterus is still contracting and relaxing well at regular intervals the woman must be placed in Sims' posture; on her left side for "R.O.T." or "R.O.P."; on her right side for "L.O.T." or "L.O.P."; while the operator tries the simple expedient of pushing up the sinciput (the region in front of the four cornered anterior fontanelle) or of pulling down the occiput during each contraction of the uterus. Where this fails to improve flexion sufficiently to bring about rotation—

(a) Where the external "os" is not fully dilated perform podalic version provided the contra-indications and conditions mentioned [Chapter XVIII (III) and (IV)] do not exclude version.

(b) Where the external "os" is fully dilated bimanual rotation may be undertaken.

Much depends on the individual preference of the operator and on his skill in one or other of the above-mentioned operations.

(c) Where the child is dead or in poor condition, when bimanual rotation or podalic version has failed or where the patient is exhausted or the membranes have been ruptured upwards of 24 hours immediate craniotomy must be performed and the greatest care taken, in extracting the foetus, to avoid further damage to the already devitalised birth canal.

[Some authorities prefer to aid rotation in such cases, when seen early, by making the patient lie on the side to which the occiput of the child is directed, instead of in Sims' posture. They also advocate alternate short periods in the knee-chest posture with intervening intervals of rest].

(d) Where destructive instruments are not available see [(17) (c)] below.

17. After the parietal bosses have descended below the ischial spines always bear in mind the possibility of deep transverse arrest. With the patient in Sims' posture, try the simple expedients of pushing up the sinciput (the region in front of the four cornered anterior fontanelle), or of pulling down the occiput. Occasionally the effort to pull down the occiput will cause it to rotate to the front. Anterior rotation of the occiput may also take place while the operator is searching for the posterior ear. Full antiseptic ritual is of course necessary for all the above manipulations. When the above manipulations fail to improve flexion and induce rotation three alternatives remain:

(a) Bimanual rotation, provided the child is alive, followed, if necessary, by the application of Willett's or the obstetric forceps according to the dilatation of the external "os."

(b) Craniotomy, which must be carried out as soon as the child is dead or in very poor condition or whenever other manipulations or modes of delivery would risk damaging the vagina and perineum of the mother, which by this time are probably considerably devitalised.

(c) In the absence of destructive instruments—

(i) Perform podalic version even if the child is dead provided there

are no contra-indications and the conditions are fulfilled as laid down in Chapter XVIII (III) and (IV).

(ii) Where obstetric forceps are available they may be applied to the head, provided the external "os" is sufficiently dilated, and by means of a pair of scissors or other suitable instrument the skull must be perforated as near as possible to the vertex. The brain matter will ooze out provided the falx cerebri is cut up. If this does not reduce the size of the head sufficiently to enable extraction as a "P.O.P." to be accomplished without damage to the perineum, Smellie's manoeuvre must be attempted [see Chapter XIX].

(iii) Where obstetric forceps are not available, if the head cannot be perforated and reduced sufficiently in size to enable it to be pulled out by traction on the scalp or bones using hæmostats or other forceps, podalic version should be attempted and delivery effected as suggested in Chapter XX.

18. The choice of actions may be summarised as follows:—

(a) Perform bimanual rotation provided—

(i) Uterine contractions are present at regular intervals and there is no danger of rupturing the uterus.

(ii) There is no placenta prævia. An exception may be made where the external "os" is fully dilated and is not encroached upon by any part of the placenta. In this case rotation should be followed by the application of obstetric forceps if there is any bleeding.

(iii) The child is alive and the funis is not prolapsed.

(iv) The pelvis is sufficiently roomy for subsequent delivery.

(v) The external "os" is sufficiently dilated to admit a hand.

(vi) The parietal bosses have engaged in the pelvic brim.

(vii) The operation is as easy as or easier than podalic version would be.

(b) Craniotomy—

(i) As soon as the uterus is in danger of rupture;

(ii) When the membranes have been ruptured 24 hours and there is no prospect of immediate delivery by other means;

(iii) When bimanual rotation or podalic version have failed or are impracticable;

(iv) Where the disproportion is more than "slight";

(v) As soon as the child is dead and there is delay.

(c) Podalic version [see Chapter XVIII (III) and (IV)]—

(i) Where the parietal bosses are above the ischial spines or where this operation is easier to perform than bimanual rotation provided the integrity of the uterus is not endangered;

(ii) Where there is placenta prævia but [see (i) (b) above] the child is alive and there is not more than slight disproportion.

(ii) Where there is prolapse of the funis and the child is alive.

(iii) Where the occiput fails to remain in an anterior position after bimanual rotation and the application of Willett's forceps.

(v) Where contractions of the uterus are weak and the external "os" is dilating too slowly.

(vi) Where the child is dead and craniotomy instruments are not available.

(d) Apply Willett's forceps.—

(i) After bimanual version where the occiput tends to revert to a transverse or posterior position and where owing to the external "os" not being fully dilated obstetric forceps cannot be applied. A case of this type may be more suitable for podalic version provided the child is alive and the pelvis will permit of natural delivery.

(ii) In a case similar to the above where the child is dead but destructive instruments are not available.

(iii) To dilate the external "os" sufficiently for craniotomy to become practicable, but this may usually be better accomplished as described in Chapter XV, III.

B. THE OPERATION :—

(a) Preparations must be made as described in Chapters I, III & XV.

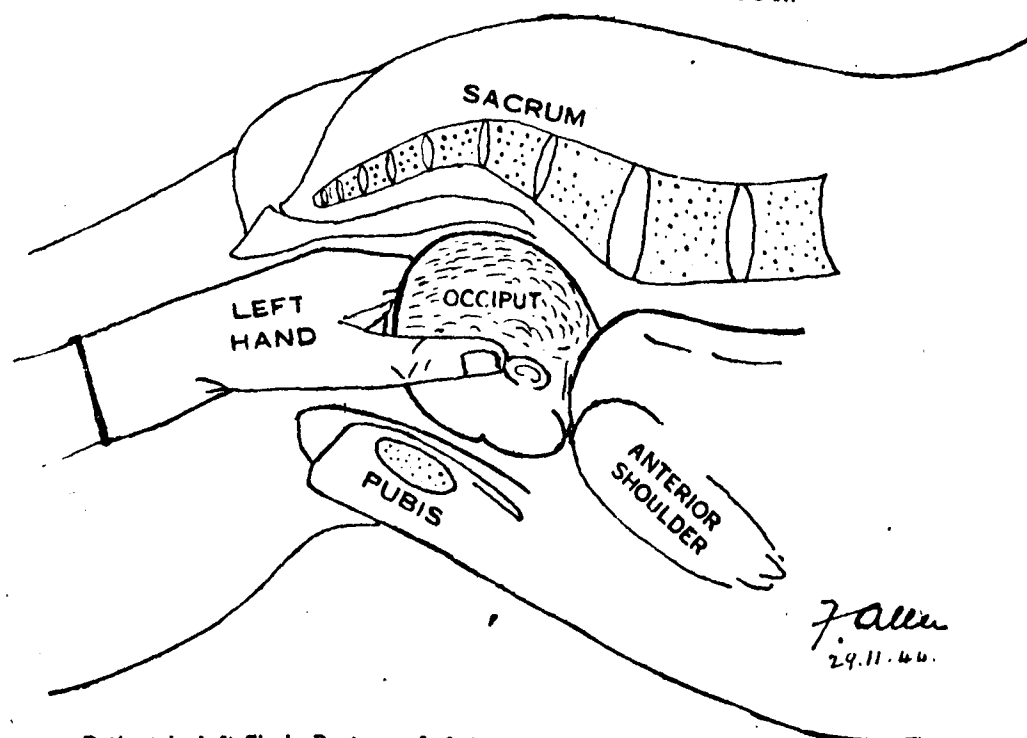
(b) At least half a dozen towels which have been boiled in an antiseptic solution should be ready to cover the buttocks and abdomen or else these areas must be rendered surgically clean.

(c) It is essential to iron out the pelvic floor and the vagina.

(d) An anæsthetic should be given if at all possible. The anæsthetic should be pushed to the surgical degree if a competent anæsthetist is available.

(e) During the operation the hand of the operator, which is in the vagina or uterus, must never be moved whenever the uterus is undergoing a contraction.

First method.—(1) The patient may be in the dorsal lithotomy posture



Patient in left Sim's Posture. Left hand of Operator rotating head clockwise.

or in Sims' posture. Where the occiput is to the right the head must be rotated clock-wise. Where the occiput is to the left the head must be

rotated counter clockwise. Where the foetal occiput is towards the mother's left the roles of the operator's hands, and of the blades of the forceps, must be reversed.

(2) Where the foetal occiput is to the mother's right the operator must introduce the fingers' tips of the left hand through the vagina and cervix, rupturing the membranes if they are intact, until he can reach the posterior ear with the tips of the index, middle and ring fingers while he places the tip of the thumb over the anterior parietal bone.

(3) Where the head is not freely moveable it must be displaced upwards, but beware of increasing the difficulties by doing this unnecessarily.

(4) The operator covers his right hand in a sterile towel, if such is available, and places the hand on the right side of the mother's abdomen over the anterior shoulder of the child.

(5) Both of the operator's hands working in concert must rotate the head and anterior shoulder of the foetus clockwise until the occiput and back of the foetus are anterior.

(6) The internal hand must now flex the head while the external hand presses the occiput down into the pelvis until a contraction fixes the occiput satisfactorily in its new position.

(7) Where the operator finds that the occiput will not remain anterior but reverts to the posterior or transverse position as soon as the pressure of the fingers are removed it is necessary to apply obstetric forceps where the external "os" is fully dilated or Willett's forceps (2 pairs are better than 1 pair) where complete dilatation of the cervix has not been achieved. For this purpose the patient must be turned over if she is in Sims' posture.

(a) Where the external "os" is fully dilated, while the internal fingers maintain their grip upon the occiput in the anterior position, the right hand of the operator must introduce the right blade of the obstetric forceps over the posterior ear. The internal fingers should help to guide the blade into position. The left blade of the forceps must now be introduced and when safely adjusted over the anterior ear the internal hand must be withdrawn and the locks of the forceps articulated. (See Chapter XX).

(b) Where conditions for forceps are not fulfilled or where forceps are not available, one, or better two, pairs of Willett's forceps (or in the absence of Willett's forceps volsellum, ring, tongue, or other flat tipped forceps may be substituted) must be affixed to the occiput region of the scalp with the occiput in the anterior position before the internal fingers are withdrawn. In this manner flexion in anterior position may be maintained.

(8) Occasionally when the head is low it is easier for the operator to perform bimanual rotation by using both hands internally.

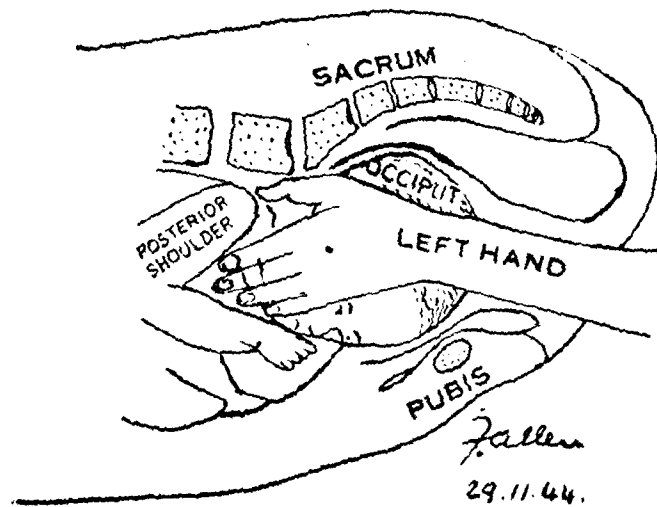
The foetal head will not retain its anterior position unless an assistant rotates the body of foetus while the operator is rotating the head.

(9) Where the occiput has rotated into the hollow of the sacrum observe in which oblique diameter the shoulders lie because one must know whether to rotate clockwise or anti-clockwise. Visualise the route required to bring the back to the front by the shortest arc and rotate thus.

Second method.—The patient may be in the dorsal lithotomy posture or in Sims' posture.

Where the foetal occiput is to the mother's right one must introduce the finger tips of the left hand through the vagina and cervix, rupturing the membranes if they are intact, and displace the head sufficiently upwards to enable the finger tips to pass the head and obtain a hold on the anterior shoulder. Cover the right hand in a sterile towel and place it on the right side of the mother's abdomen over the anterior flank of the foetus.

IMPROVING AN "R.O.P." POSITION



Patient in left Sims' Posture, left hand finger tips of operator rotating posterior shoulder clockwise. (The hand is drawn too small and the pelvis is not tilted sufficiently to avoid obscuring details.

Exert simultaneous pressure with both hands and rotate the foetus clockwise to the opposite transverse diameter of the mother. Use the internal hand to flex the head while pressing the occiput down into the pelvis with the external hand until a contraction fixes the occiput in position.

Where the foetal occiput is to the mother's left the function of the operator's hands must be reversed and the infant must be rotated counter clockwise.

Where there is

any difficulty in reaching the anterior shoulder try the third method.

Where the shoulders cannot be rotated see First Method (7).

Where the occiput is in the hollow of the sacrum see First Method (9).

Third method.—With the patient in Sims' posture where the foetal occiput is to the mother's right the operator must introduce the tips of the fingers of the left hand through the vagina and cervix, if necessary rupturing the membranes and displacing the head upwards, but only just sufficiently to enable the finger tips to obtain a pressure on the posterior shoulder. The right hand, covered in a towel, must be placed on the right side of the mother's abdomen over the anterior shoulder of the foetus.

With both hands working in union the child must be rotated clockwise so that the posterior shoulder passes from the mother's left side across her vertebral column until the right side is reached.

When the posterior shoulder is safely lodged in its new position the internal fingers must flex the head by pushing up the four cornered anterior fontanelle while the external hand must press the occiput down into the pelvis until it is fixed there by a contraction.

Where the foetal occiput is to the mother's left the role of the operator's hands must be reversed and the child must be rotated counter clockwise.

Where the shoulders cannot be rotated see First Method (7).

Where the occiput is in the hollow of the sacrum see First Method (9).

2. With patient in dorsal lithotomy posture. Where the foetal occiput is to the mother's right the operator will find his manipulations facilitated if he introduces the tips of the fingers of his right hand through the vagina and cervix, if necessary rupturing the membranes.

The head must be displaced upwards only just so far as is required to enable the fingers to obtain a grip on the posterior shoulder. The left hand covered by a sterile towel must be placed on the right side of the mother's abdomen over the anterior shoulder of the infant. Both hands working together must now rotate the child clockwise until the occiput and back are anterior.

The internal hand must now push on the four cornered anterior fontanelle to flex the head while the external hand must press the occiput into the pelvis until it is fixed there by a contraction.

Where the occiput is directed to the left the role of the operator's hands must be reversed and the child must be rotated counter clockwise.

Where the shoulders cannot be rotated see First Method (7).

Where the occiput has rotated into the hollow of the sacrum see First Method (9).

II. Bimanual rotation of the chin in persistent transverse and posterior positions.—The treatment of these cases is exactly the same as for persistent transverse and posterior positions of the occiput with the following exceptions:

1. The parietal bosses being further from the presenting part than in vertex presentations the presenting part must descend much more deeply into the pelvis before the parietal bosses engage in the brim of the pelvis. Beware of trying to apply forceps too early before the parietal bosses are engaged in the brim which will not take place until the face is on the pelvic floor, or, to be more exact, until the root of the nose is a couple of centimetres (one inch) below the level of the ischial spines.

2. The shoulders are relatively lower than in vertex presentations and so, unless the face is wedged low down on the pelvic floor bimanual rotation by passing up the internal hand to the anterior or to the posterior shoulder may be easier than version even if the parietal bosses are not engaged in the pelvic brim.

3. In performing bimanual rotation the chin must be extended by the operator as opposed to the flexion of the head which was described in cases of occipito-posterior or occipito transverse in (I) above.

4. "R.M.P." corresponds to "R.O.P."; "R.M.T." corresponds to "R.O.T."; "L.M.P." corresponds to "L.O.P."; "L.M.T." corresponds to "L.O.T." for purposes of description and use of hands and postures.

5. Where the chin is directed into the hollow of the sacrum observe in which oblique diameter the shoulders are lying because you must know whether to rotate clockwise or counter clockwise. Visualise the shortest route which will bring the chest of the child to the front and rotate in that direction performing upon the head, shoulders and body of the infant simultaneously.

III. Improving a brow presentation.—Brow presentations are difficult to recognise owing to caput formation. In order to feel the mouth and alveolar processes the examiner's finger tips must be passed well beyond the

nose. To feel the four cornered anterior fontanelle the examiner's finger tips must travel quite a distance over the scalp.

Where diagnosed early, which is improbable, podalic version must be performed as soon as the external "os" permits, provided there is no more than slight disproportion. Craniotomy is the alternative.

Later, provided there is no more than slight disproportion and there is no risk of rupturing the uterus the brow may be converted into a vertex or into a face as an alternative to craniotomy. The Sims' posture may be of assistance. Anæsthetic is a great help. When the child is dead or where the membranes have been ruptured upwards of 24 hours craniotomy is the operation of choice provided the necessary instruments are available.

Theoretically if the occiput is posterior the occiput should be pushed up and the chin pulled down.

The operator may employ the fingers of both hands internally or he may prefer to utilise one hand externally in an effort to pull the chest of the child forward and thus extend the neck. In either case the hands of an assistant should help manipulate the child through the abdominal wall of the mother.

Where the occiput is anterior the chin should be pushed up and the occiput pulled down while an assistant endeavours to draw the chest forward and by pressing on the breech flexes the body of the child.

In actual practice the important thing is to produce either a vertex or a face in any position, whichever is easiest, and, if unsuccessful, to waste no time before performing craniotomy.

Only if the child is tiny and/or the pelvis capacious forceps may be applied and a tentative attempt made at extraction. If the perineum is endangered or delivery is not easy there must be no compunction about resorting to craniotomy immediately.

IV. Improving a cephalic presentation complicated by a prolapsed arm.—1. Where an arm is found to be prolapsed it is important to ascertain whether the presentation is oblique, transverse or cephalic. In cephalic presentations the treatment is not necessarily podalic version.

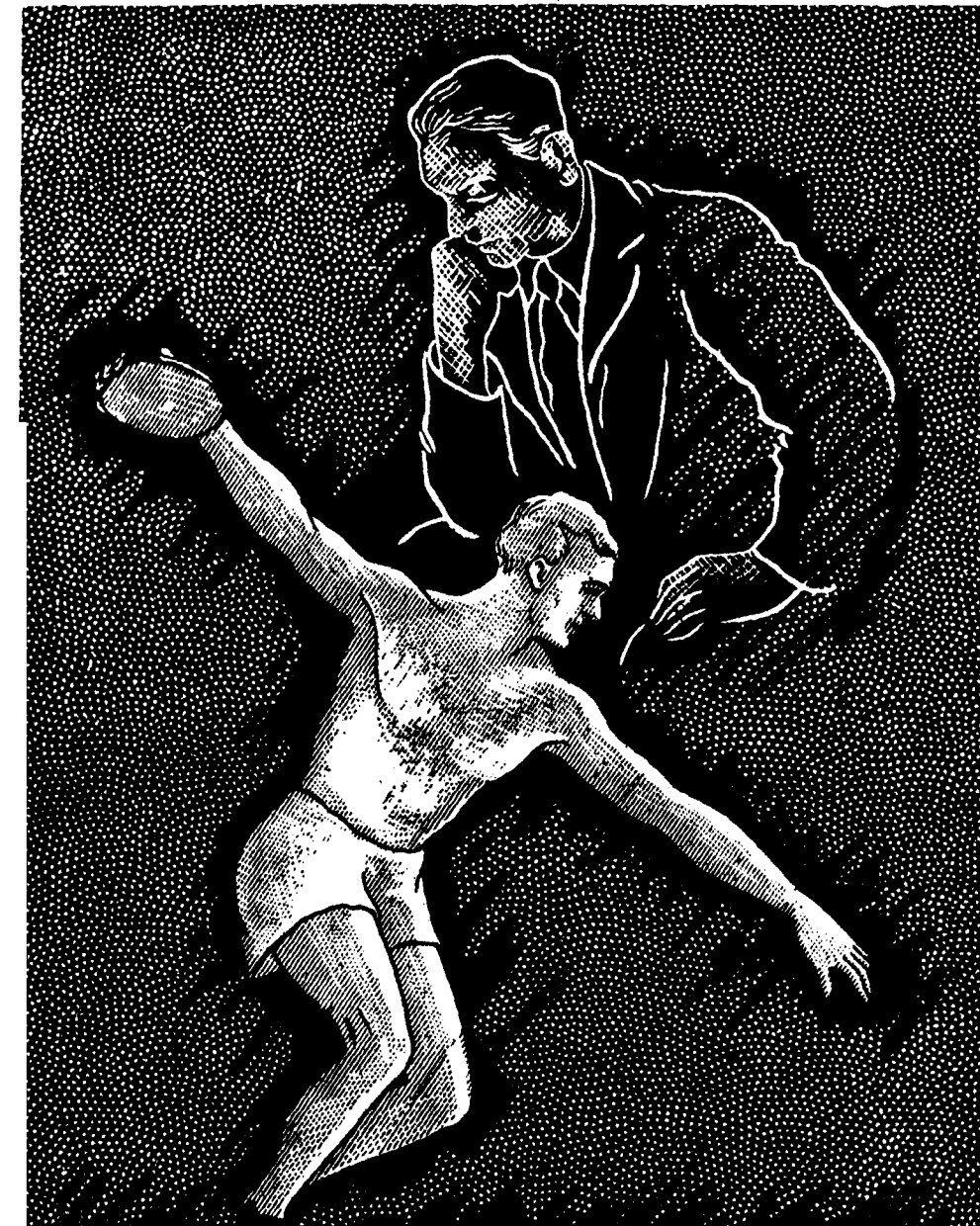
2. Replacement is to be preferred whenever possible, provided there is no risk of rupturing the uterus, the child is alive, there is no placenta prævia or prolapse of the funis and there is not much disproportion. Where the pains are weak Willett's forceps and light weight traction may be employed to keep the vertex down into the pelvis.

Where the external "os" is fully dilated forceps may be applied. For reposition Sims' posture and an anæsthetic may be required. If no anæsthesia is available it may be of help to place the patient in the knee-chest posture for the purpose of displacing the head upwards.

3. Podalic version is the operation of choice where the condition is complicated by a placenta prævia or prolapse of the funis provided there is no disproportion. A noose must be placed on the prolapsed wrist before version.

4. Craniotomy when the child is dead or the uterus is in danger or the membranes have been ruptured 24 hours or there is disproportion.

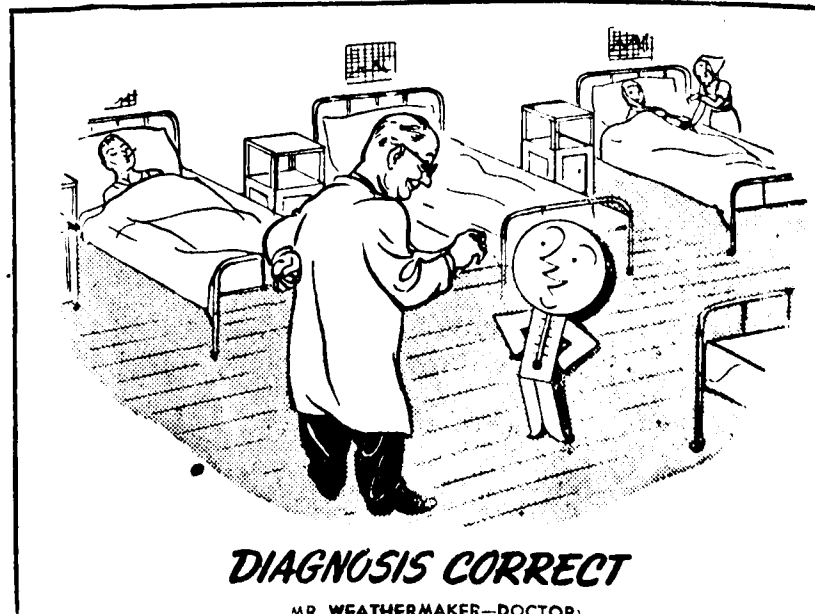
5. Occasionally where the foetus is small or the pelvis capacious forceps delivery is possible without prior reposition of the prolapsus.



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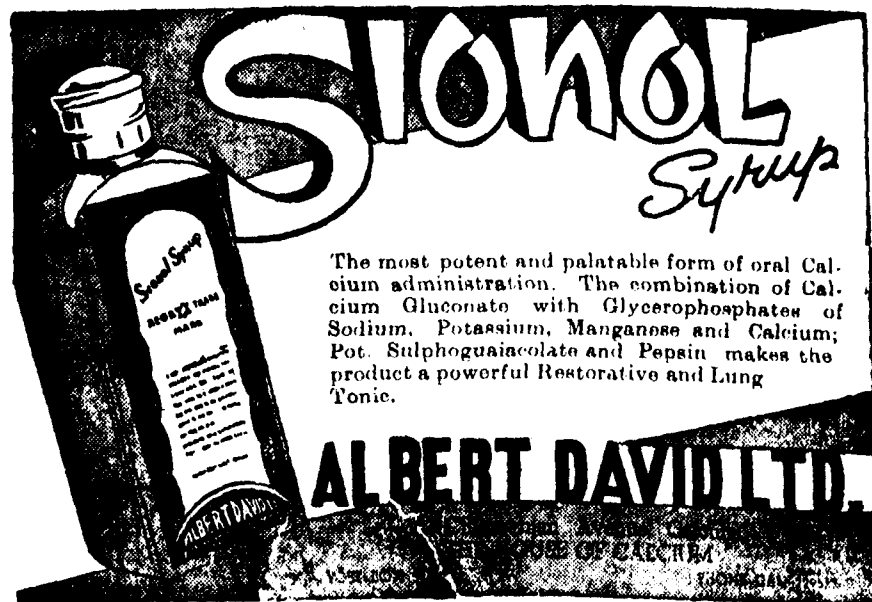
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Malaria and its Oriental Treatment

A STUDY BY

HIS HOLINESS SHREE SWAMY VAIDYANATHENDRA BHARATHI,
Mysore.

Introduction.—Possibly the history of malaria and its Peruvian bark (*bahlik twacha*) treatment are almost as old as the world itself, although Quinine might, at its best, be of a more recent origin. In the same way, again, as malaria has persistently maintained the whole of its native *bahlik* characteristics in all its later habitats, the Peruvian bark (*chinchona*) treatment also has well survived the progressive changes of the world, civilisational, scientific and otherwise.

Should the "history of the world repeat itself," parallels do occur in all ages. Just as now, there was once in days of yore in this country a prolonged dearth of the exotic Peruvian bark, due to the stoppage of imports from *Bahlik Desha* during *Deva Asura Yudhas*, the ancient wars between the continentals and the Islanders, which necessitated active research in local medicine and endeavour to discover effective substitute remedies for the exotic fevers. There is a progressive and consistent record of extensive studies in *takma*, the vedic name for malaria, in the *Yajur* and the *Atharva Vedas*. And what is all the more wonderful is the recent discovery of mosquito as the host of the malarial parasite and again as the medium of transference of the fever from man to man happily finds its first mention in the vedic text.

The life history of the plasmodial parasite and the development of its spores through *parakaya pravesha aashraya* in the host bodies of owls, bats and mosquitoes and the development of the parasitic spores and their transference through *ishumatra mishumatra paryaavartana* or the mere sting of the *twaashtra krimi* or the modern mosquito of the class of anophele, an agency insect, are all literally described in the text so well as to suggest the possibility that the whole of the latest mosquito theory is only a happy rediscovery, like the hoary Ehrlich's side chain theory of bacterial infection which was long foreshadowed by the *Bodhayana Shruti* relating to *phaleekarana homa* of the initial puerperal ceremonies.

In the sequence of events, it is also strikingly true that the Vedists also found a fitting substitute for the foreign *bahlik twacha*, in the discovery of the indigenous drug *pushkara moola* or the modern *radix costus indica*, which the ancient Orientals activated and energised with arsenic, iron and other minerals, just like the modern cinchona, in order to obtain immediate and all round effect in controlling the *takma* and other forms

* Specially contributed to THE ANTISEPTIC.

of *vanya jwaras* in the different provinces of the country, perhaps thereby throwing the exotic bark treatment into some sort of utter disuse and even disrespect for its deleterious effects in the later peace times.

Happily, it has been possible to collect the different *Shruties* from the different Vedas and piece them up in the form of a small brochure, the subject matter of which is herein presented in running English. At the same time, the pharmaceutical and the therapeutic sides of the primitive study could also be objectively pursued, not without difficulty, with the result that a primitive substitute remedy is correctly evolved, elaborated and successfully landed into modern medicine, appropriately naming the product as "Antique Quine."

The primitive remedy in its present tablet form has been found not only effectively to control every type of malarial fever but also to quickly and completely destroy both the plasmodial and the hæmocyta forms of the protozoal parasites with a degree of uniformity. And from its sweet taste, substantive effects and, additionally, perfect freedom from abortive and other evil after effects, since proved by the clinical, chemical and pathological and other exhaustive laboratory tests by experts, the product richly promises to well fit into modern medicine irrespective of the availability or otherwise of Quinine and its synthetic and therapeutic substitutes.

As such, the venture to present this small thesis and again the indigenous remedy for public appreciation and utility, will be pardoned as a humble effort to ventilate the hidden treasures of Oriental culture, still surviving in the heritage of the country. May it also serve as a general incentive for fruitful modernisation of Oriental sciences and give a special impetus for scientific repatriation of the Ayurvedic system of indigenous medicine in the country, is the pious hope of the author, in his service to humanity.

I. Definition.—Malaria was called *vanya jwara* in the classics and *takma* in the basics of Oriental literature, and in the Ayurvedic books *vishama jwara*. *Takma* is the name applied in *Atharvana Veda* to the whole class of *yathudhanya jwaras* or fevers of protozoal origin of which *Vritra yathudhanya* the plasmodial parasite, was found to produce a variety of intermittent fevers, some with regular intermissions, and others with irregular intermissions, and some yet with no intermissions, but only remissions, all, in some way or the other, being *vishama* or intermittent fevers. *Takma* is, however, limited to the *Sheeta-Rrurru jwaras*, i.e., fevers with chills and rigors, whether remittent or intermittent, and propagated by the sting of *twashtra krimi* and transferred from man to man according to *Yajur Veda* 2-4-12—"Yad ishumaatra mishumaatra prayaavartati yad imaam lokann aavrunath. Iti vritrasya vritratwam."

Takma, therefore, may rightly be taken to correspond to malarial fever, especially since it is described as arising through the sting of the mosquito and transferred from man to man, with the chill and rigor and sweat as the cardinal signs and *Vritra Yathudhaana* or the malarial plasmodium in the blood, elicited by microscopic tests prescribed by KASYAPA, the first Oriental bacteriologist (as expressed in *Shruti*—*Tannatu trusyam tivvyam vina. Tasmath Kasyapasya bibarhen vishwancham chakshu raamasi*, i.e., it must be objectively proved by the bibarhani or the magnifying microscope) *Bibarni nama sookshma vastu mahatic karana sadhanam*—*Iti yaaskha* (vide *Nirukta*). This indicates clearly that the clinical

picture is incomplete in the diagnosis of *takma* or malaria unless supported by the blood picture also after microscopic test.

This also shows clearly that the Orientals well conceived the importance of blood tests and microscopic findings as a necessary diagnostic expedient, especially where the clinical symptoms are masked and the intermissions not well defined, as well as for declaring the therapeutic effect of anti-malarial remedies and the assurance of prevention of relapses after apparent cures.

II. Geographical conceptions.—While *Yajur Veda* 2-4-12 questioned the indigenous nature of the fever and its exact nativity, *Atharva Veda* 5-22-5 declared that *takma* was an exotic disease, manifestly imported from Bahlik Desha (corresponding to modern Peru, Siam, Cochin and China) through the timber agencies of *Twaashtra Prajapathi*, the Engineer Lord of yore. Later, through the migratory timber and engineering staff, it rapidly expanded in Gandhara, the modern Assam, Vanga, the modern Bengal, Magadha in Central India, and eventually to the whole of the country. After active anti-malaria expansion projects in the vedic period, the whole of the plains was cleared of the scourge and the fever was got limited to the *mojavanta*, and *parvata vana* or the marshy and mountain agencies, and was occasionally endemic in certain *avrata pranta* or insaniary slums and neglected places, and later rightly came to be called as *vanya jwara* or *manya jwara*, meaning an ague or agency fever. This conception is in perfect consonance with the modern name *malaria*, (*Mal-nadu jwara*?) which appears to have got itself from Malay Peninsula, its original home. At the present time, however, there is practically no place in India, or the world, free from malaria.

III. Aetiology of takma and parasitic analysis.—No doubt, the disease was for a long time mistaken for some sort of gastro-intestinal toxæmia; but, when the fever raged at one time more or less in the epidemic form the matter was referred to the epidemics department. Lord ANGIRASA, the head of epidemiology in the vedic age, made extensive studies and was the first who declared the parasitic origin of the fever, and found that the fever visited birds and animals also, and he classed the parasite as a *raktasi* or hæmocytozoa, and found it was transferred from animals and birds to humans through the sting of *viswa roopa twashtra krimi*, a kind of mosquito.

Later, with the collaboration of KASYAPA, more detailed studies were undertaken, as a result of which it was proved that there were primarily two classes of *vritra*, one which flagellates and the other which does not flagellate. Among the non-flagellating types, the smaller and the oval form was found to be sexually more active than the large and round type. It was also found that all the parasites do not flagellate alike and that they also possessed different sex co-efficients. They were accordingly classified into three different classes or groups according as they develop one, two and three flagellæ on their bodies, and their sex activity was progressively delayed in the same order. ANGIRASA, at one time, observed that the fever corresponds to the time of the parasitic sporulation, and during the periods of sex-inactivity the parasites enagage on shield and cyst formations in the organs of their election, some in the lungs and the others in the liver and the spleen.

This was exactly how the parasites were grouped into according to the length of the intermissions, namely (1) *Ubhayaadue vritra* or the double

daily fever parasite, (2) *Aahika vritra* or *Ekadue vritra* or the daily fever parasite, (3) *Anye due vritra* or the alternate day fever parasite, (4) *Truteeyaka vritra* or the three day fever parasite, and (5) *Chaturdhika vritra* or the four day fever parasite. At one time, KASYAPA contested that there was another parasite, (6) *Vitruteeyaka vritra* or the mixed tertio-quartan parasite.

In the later studies of KASYAPA, it was also elicited that there was also a difference between the spores of one class of parasites and the spores of the other class of parasites, some being *Arjuna kshullaka* from their white colour and the others, *Saaranga kshullaka* from their mottled pigmented appearance. *Kshullaka* means a spore. It was alleged, though this distinction was more academic, that the *Saaranga kshullakas* infest the nervous system and the brain and the higher centres and are responsible for the comatose and pernicious forms, namely *Bhramaka takma* and *Vainashika takma* respectively. The *Arjuna kshullakas*, in their turn, were connected with all the other gastro-intestinal and pulmonary forms, namely *vamaka takma*, *rechaka takma*, *rakta steevi takma*, and the *vata-balaska takma* corresponding to the gastric form, the intestinal form, the hemorrhagic form and the pulmonary form respectively of modern malaria.

Another important observation was later made by KASYAPA and his pathological assistants, that the parasites have a natural election for certain organs, especially the liver, the spleen and the lungs, where they form regular colonies and depots and eventually develop cyst formations, which are lobular in the liver and the spleen, and squamous in the lungs. This accounts for the progressive enlargement of the liver and the spleen in the *greeshmaka takma* or the spring-summer malaria, and the congestion of the lungs and the respiratory difficulty and emphysematic enlargement and inflation of the lungs in the *viswa sharada* or *astivo-autumnal* malaria.

IV. **Morbid anatomy.**—*Vritra* parasites being classed among *Yathu-dhanas*, which act by *paroksha paryavarthana* or in an insidious manner, it was doubted whether there would be any morbid signs of anatomy at all; but the later studies, especially the contributions by Vishnu, the Lord of neuro-pathology at a later time, suggest that three distinct kinds of toxins would be developed by the *vritra*, it being a *raktashi*. According to *Pajur Veda* 2-5-2, the toxins produce certain cachexial symptoms, the chief of which may be classed as follows—

(1) The blood became more or less watery with diminution of its pigment leading to progressive anæmia, and with diminution of its *Rakta-bhrat* content of thrombokinas and coagulability, leading in turn to some sort of hæmophilia and hæmorrhages, of *Raktasteevi* type, sometimes fatal too.

(2) The gastro-intestinal mucus membranes acquire a sort of hyper-excitability setting up hyperemesis in *vamaka takma* and choleric diarrhoea in the *Rechaka takma*.

(3) The third variety of the toxins inhibit the nerve centres and produce the comatose form of *Bhramaka takma* or the *Vainashika takma*, the pernicious malaria itself.

V. **Life cycle of the parasite.**—It will be very interesting, indeed, to find full details of the life cycle of *vritra* in the *Atharva Veda Shruti* beginning with "*Ulooka Yaalam Sulooka Yaalam*" which emphasises that the bat and the owl are the chief hosts of *vritra*. Next, the *vishwaroopo krimi*,

a class of mosquito of the *twashtra* species, corresponding to the modern anophele, was found to be the best carrier of the *vritra kshullaka* from the bodies of the birds to man and again to transfer them from one man to the other. The *Shruti* mentions that *vritra* parasites do profusely sporulate, but that some of the spores do not attain maturity of sex and they require special media and often *parakaya pravesha* for the required incubation and development in the host's body, preferably of the bat and the owl. It was later discovered that the spores as well develop in the bodies of the *twashtra krimi* itself which is originally fed upon the water fertilised with the dungs of the bat and owl, and attain fitness for transfer through *ishu*, the sting. It was also adduced that the spores cultured on water fertilised with the above excreta might also attain a high degree of penetration, so that when they get into the stomachs of the humans along with the contaminated water, they might possibly burrow into the walls of the stomach and reach the blood current, without the necessity of the mosquito sting for inoculation. It was later suggested that the excreta of the pigeon, the fowl and the dove are also good fertilisers and *vritra* culture media, for which reason they were all severely thrown into the list of *avrata* agencies.

This accounts for the prevalence of the fevers in the early *varsha ritu*, due to the dungs of those birds in the old temples and other given up buildings being washed down into the water sources of the villages and contaminating the drinking water.

VI. **Takma chitra or clinical forms.**—There were indeed many types of *takma jwara*, in the vedic text but the following constitute the chief and the most commonly met with. They are:—

(1) *Vishva Sharada Takma*, representing the common *Sarad ritu* corresponding to the modern æstivo-autumnal malaria.

(2) *Greeshmaka Takma* or the spring-summer malaria.

(3) *Vaishamya Takma* with its two divisions (a) *Saatata takma* or the irregular intermittent fever with irregular and indistinct intermissions and (b) *Santata takma* with regular intermissions including (i) *Aahika* or *Ekadue takma* or the daily quotidian fever, (ii) *Ubhaya due takma* or the double quotidian fever, (iii) *Anyedue takma* or the alternate day fever, (iv) *Truteeyaka* or tertian fever, (v) *Chaturdhika takma* or quartan fever, (vi) *Vitruteeyaka takma* or the mixed tertio-quartan fever.

(4) *Bhramaka takma* or the delirious form.

(5) *Moorchana takma* or the comatose form.

(6) *Vainashika takma* or *Antika takma* or the pernicious form also called *Taludya takma* in *Atharva Veda*.

(7) *Vamaka takma* or the gastric form, with projectile vomiting and severe prostration out of all proportion to the temperature of the fever.

(8) *Rechaka takma* or the intestinal form with more or less choleric type of diarrhoea, often simulating, in the mild forms, the typhoid fever.

(9) *Vata Balasaka takma* or the pneumatic form, which sets in with severe bronchial implications and respiratory difficulty simulating pneumonia and each time leaving a squamous infiltration on the walls of the passages, leading to progressive loss of contractility of the mouths, resulting in emphysema.

(10) *Raktasteevi Takma* or the hæmorrhagic form, the mild forms representing hæmoglobinuria developing into what is commonly called black water fever, and the major forms, in which the livers and spleens are heavily engorged and might give in to the least trauma and spontaneous ruptures to carry away the patient.

VII. Takma nidana or diagnosis.—In all the patent cases, where the *takma janjabhya* or the malarial paroxysm and its three *doshas* of *sheeta*, *rhurru* and *gharma* or the cold, rigor and sweat are all well defined, there should be no difficulty in denominating the fever. But, difficulty comes in where the symptoms are less defined or masked and the fever is continuous without remissions or intermissions. Then one is best recommended for *kasyapa samkeertanam* or microscopic consultation. *Kasyapa chitra* or blood picture no doubt gives definite clues to correct diagnosis; but it is not possible to get at it in the rural areas, and again the bacterial tests are often inconstant because the parasites may not show in the peripheral blood at all times, especially when the fever is off and the parasites are either at rest or asexual at the time. The diagnosis should not be hastily concluded unless after repeated blood tests.

Further, it should be remembered that in chronic cases and in all cases where a preliminary treatment with the *baklik twacha* or other appropriate remedies were effected, the blood test will be inconstant, the parasites having retired into their hiding places. It was therefore thought that urine analysis should also be instituted in all cases both for primary and confirmative evidence.

ANGIRASA devised *mehaneeli pareeksha*, which, it was claimed, gives dependable results from the very onset. It comprises of adding one or two drops of a *shalamsha dravana* of *meha neeli*, probably corresponding to the modern mythil. blue 1% or 0.5% aqueous solution to the urine which, when looked against a white back ground like a wall, does not change colour in *non-takma* fever, while it shows a change into *suka-peeta* or green in all cases and stages of *takma*. This change is due to the presence of *ranjaka* or hæmoglobin, though in minutest quantities, in malarial urine, and therefore positive in more than 90% of cases.

VIII. Takma vaivarta parinama or malarial sequelæ.—The most common consequences of malaria are the enlargement of the spleen and the liver and the concomitant dyspepsia. Malaria is more or less a self limited disease of short duration and usually in a week or less it passes away and the patient gets back his normal health without any loss of time. But, as time passes on, it becomes more or less chronic and involves the visceral organs. *Takma*, by itself, was never known to be fatal except for the spleen, kidney and lung complications. Even in non-hæmorrhagic cases *haleemakha* jaundice often sets in, leading to quicker termination. Kidney complications lead to *neelerakta* or *neelameha* or hæmoglobinuria of the pronounced black-water type which is usually refractive. The lung complications are perhaps the least dangerous, although the respiratory difficulty is sometimes very pronounced. Synchronously with the indurations in the lungs, the heart also may occasionally be involved, manifested in progressive asthenia due to decompensation.

IX. Takma or malarial cachexia.—*Yajur Veda* describes how diseases become *gyog* or chronic and produce relative cachexias. In *Yajur Veda* 2-5-2 to 12, we are told that the malarial parasite generates a number

of *papmas* or toxins of which the *tittiri papma* or the gastro-intestinal toxins induce a more or less progressive anorexia and dyspepsia resulting in malnutrition and deficient growth and energy. Gradually the liver and spleen will get engorged and lead to deficient blood formation, manifested by the feeling of malaise, lassitude, even asthenia, and evidenced by the anæmia and the presence of hæmoglobin and other bile pigments in the urine. In all the cachexial cases *mehaneeli pareeksha* will be positive and dependable, suggesting the chronicity of the lurking parasites in the blood and demanding appropriate anti-malarial treatment in the first instance, before active recuperation is instituted.

X. Takma pounarpunya or malarial relapses.—*Takma* being a *swayam-virama jwara* or self limited and short duration fever, the paroxysms spontaneously stop away; but the disease is prone to repeat itself without notice. The *viswa sharada* and the *greeshmaka* fevers do return in their seasons, and in the case of the rest, it is difficult to predict the return, as observations grossly vary on this point. In *Yajur Veda* 2-5-2 was suggested the possibility of *vritra yatudhana* being normally present in the body of every human being in all ages and seasons and places; but it may not show any signs or symptoms for years together. This accounts for the dormition of the parasite in two possible ways, one the possibility of a sterile and non-sporulating species and the other the production of *vartraghna* toxic anti-toxins? by the *pramadha ganas* (blood buffers?) through their inter-action on the *takma papma* itself, which inhibit the sex activity and sporulation necessary for the production of *takma janjabhyam* or paroxysms of the fever.

Later still, Lord BODHAYANA the heavy epidemiologist of the Sutric age, extended his bacterial side-chain theory to the flagellating parasites also, and suggested the possibility that the *pramadhas* somehow manage to knock out the profile flagellary projections from the bodies of the parasites, and that the dislodged flagella which originally assisted the parasite to pierce and devour the *raktakana* or blood cells, now pierce the parasites themselves and either kill them outright or make them sterile at the sites themselves and either kill them outright or make them sterile at the least—vide *Bodhayana's phaleekarana Homa Sutra* No. 4.-7. beginning with *eitha nagnatai thaam grihneetei swayam*, *Brahmanasputraha* during the course of which the cycle of infection and paroxysms of the fever get reversed and a specific immunity and freedom from malaria afforded spontaneously.

Thus, the possibility was established for natural immunity as well as possibility of acquiring immunity against not only malarial fever but also every other protozoal fever by persons living in the endemic areas, all of which will be detailed in the para under *takma swasthi*.

(To be continued).

Health of the University Students In India*

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MENS SANE INCORPORA SANO.

THE duty and functions of a University, in regard to the health of the students, have been well emphasised by the Calcutta University Commission Report (1917-1919) thus:—

"The University must be in a position to assure the public that the students, to whom it awards its Degrees, have received their training under conditions, favourable to health and character, as well as to intellectual attainments."

That Universities afford ample opportunities to develop and achieve intellectual attainments need no comment. But, how far they have equally attended to favourable healthy conditions, let each University, each Vice-Chancellor, answer frankly. It is a tale of not having done the right thing.

Thanks to the above report, the Universities throughout India have imposed statutory obligations on all the affiliated and constituent colleges, to have a student medically examined, at least once in three years, regularly from 1927 onwards. Beyond this, they have not taken any steps to make this beneficial scheme a *live* one. There is no follow up work. The present medical inspection of college students is a waste of public money, for it benefits neither the student concerned, nor the institution, nor the medical examiner.

It is true that there is a medical examination of school children, as of the college students, but the defects in the system are obvious and require immediate pruning. Unless the University (elder-brother) leads, the school (younger-brother) will not follow nor even emulate, which all results in a growing race of sickly and undeveloped people, unfit for any walk of life.

The evil effects of higher education on the health of the student, the future leader of the country, have been forcibly expressed by all leaders and observers. The present educational policy has resulted in the cartoonist caricature of an educated Indian (synonymous with a University product) as *all head and no body*. That is, his normal physical build has not grown and kept pace *pari passu* with the growth of his intellect, resulting in poor physical wrecks of otherwise intellectual and intelligent giants. Obvious instances of highly academic graduated living Indians but with very poor health could be cited. A University student or a graduate knows all about History, Geography, English Literature, Mathematics, and Sciences, except his own vital health problem and health needs. Suffice it to point out that the principle *Mens Sane Incorpore Sano* has been practically forgotten.

A fallacy exists that the students (16-20 years old) manage to keep their health intact, during their University career, but in reality they do not. Not only they do not keep good health, but also they deteriorate in

* Specially contributed to THE ANTISEPTIC.

† As the Medical Officer, Presidency College, Madras, for the last 14 years, the author has observed steady deterioration in the health and physical fitness of the students. This article is based on his research work into the health, physical fitness, and dietetics of the South Indian student population.

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their physical strength and build, during this precious period of life. My research work into the causes of students' absence from College studies¹ has shown that nearly 74.6% of them fall sick, and nearly 20% of them repeatedly fall sick, and complain of remediable diseases which all affect them in later life, after leaving the school or the University. This study also shows that women students fall ill more frequently than male students.

The percentage of Indian recruits rejected by the Indian Army is on the increase². The diseases, which have disqualified them are the common eye-trouble (trachoma, defective vision), ear-ache, heart-disorders, tonsillitis, and venereal diseases.

My college statistics³ regarding the physical defects, tell the same sad tale. The percentage of diseases is on the increase. I find that there are increasingly more students, suffering from heart disorders, lung weakness, bad state of nutrition, and nervous temperament, than in previous years. The health reports of the Bombay University reveal that the "A" class of students are on the decrease annually⁴.

If this is the state of affairs in an aristocratic and well-to-do students' population of the South Indian premier educational institution, one might as well guess the poorer state of less fortunate students in other less endowed colleges. If this again is the regrettable state of health of the college students (16 to 20 years), how much more so in elementary and secondary schools' pupils, who come from lower strata of society, and who do not get the benefit of higher education or of any medical examination or advice, it is needless to comment. The health reports of the premier municipalities in India on school-children are anything but complimentary.

In assessing the state of nutrition of infants in South India DR. G. SANKARAN has made an interesting observation regarding the ability of walking, active mental state, general development and nourishment⁵.

As an estimate of physical fitness of South Indian students, I have carried out research work on the vital capacity of lungs and Livi's index of nutrition. It will be observed that the South Indian students are lowest in the scale (Appendix IV).

Physical education or training.—The word *physical training* is a misnomer. Anyhow, it has become the expression by constant usage. A fetish is made of the term and its significance. My short notes⁶ would help to show that the entire physical training activities have been looked at from the wrong angle, like the scheme of medical inspection. There is too much loose talk and also loose thinking by responsible officers in position.

To build a healthier and physically fit Indian, it is worth while taking stock of contemporary activities in other parts of the world. In Germany from 1883 onwards, attention to children's health and physical training has been devoted with an earnestness, comparable to that of rearmament race. In Italy, the children are trained to be fit for the "*tasks of war and tests of peace*." In the Balkan and Little Entente States, the health examination and physical training are compulsory. In France, an under-secretaryship in charge of sports and leisure has been created. In England

1. Indian Medical Gazette, Jan. 1942, page 44.
2. Appendix I.
3. Appendix II.
4. Appendix II, Table 2.
5. Appendix III.
6. My article—Journal of Madras University, Jan. 1939.
7. Appendix V.

from 1937 onwards, a raging campaign has been conducted to make every Briton physically fit. The White Paper on the British Physical Training and Recreation Bill of 1937, now an Act, explains that the aim is :

"To inculcate a wider realisation that physical fitness has a vital part to play in promoting a healthy mind and human happiness, in other words, to build up an A-I nation, a fitter Britain."

In this world picture of intense physical activities and fitness campaign, where does India and her Universities stand? She is a back-number and has no claim for a place in this picture.

The present propaganda of the so-called 'physical education' does not touch the crux of the health problems, has no direct bearing on the health of the individual. As the late Lord BADEN POWELL aptly remarked. *"It is a veneer to cover up the defects in the State, in not attending to the child welfare, ante-natal health and food problem."*

The remarks hold good even to this day.

University Training Corps and Military Training.—A glamour has been spread about the military training and the U. T. C. This idea originated with the late Mrs. ANNIE BESANT who created a "citizen army" in 1917, and with the formation of the now defunct Indian Defence Force (consisting of University Students.) The present U. T. C. and the military training has no health basis and no proper foundation of physical well-being. As long as the general physique is poor and the level of health low, the present approach to military training and the U. T. C. is just like the cart being put before a horse. The passive anti-gas training to our U. T. C. cadets, without a strong lung, good health and well developed body, would only result in our younger generation being made the target of attacks by diseases and bullets. The U. T. C. has been in existence for the last 22 years. What beneficial purpose has it served, except as a stepping stone to jobs? As it is, it is *yet* to play a practical part in the body politic of our country. The primary need of the hour is, therefore, the proper and careful health education of the youths and children, so that they may be physically fit for any walk of life.

The Inter-University Board took active interest in 1931, in issuing a brochure-instructions to medical officers—regarding the medical examination of pupils, but they have not taken any step to find out whether their recommendations have been acted upon. Their enthusiasm has evidently waned.

A few educationists like the late Prof. P. SESHADRI, have interested themselves in the health of the students, but this does not serve the purpose of one *uniform* policy throughout India, the health, happiness, and well-being of children. In 1938, even the Central Advisory Board of Education at its meeting at Bombay, while considering number of subjects, like the WOOD-ABBOTT's report, and even religious instruction, did not tackle the health problem. Even the Inter-University Board was indifferent to the pupils' health problem, as could be gathered from its meeting in 1939. Thanks to the efforts of Mr. JOHN SARGENT,¹⁰ in 1942 a scheme of health education was drawn up for the benefit of children. All the Universities

8. (Times, London National Health Supplement. 1937.)

9. My article—South Indian Teacher, June 1938.

10. Educa. Adviser., Govt. of India.

have been more worried about imparting the 3 R's. than to attend to the health of their wards.

The public health departments have been devoting their attention to the treatment of those who *actually* fall ill. *To cure is the voice of the past, to prevent the divine whisper of to-day.* The present unhealthy state of children, the low average of life of Indian (22.39 years), the high rates of infantile and maternal mortality, the poor physique and general low level of health, all these point to the fact that we have been treating health problems in a *laissez-faire* manner, as a social question, rather than as a nation-health-building activity. We have no health policy.

A League of Nation's enquiry into the period of life, when men are most predisposed to attacks of diseases, which make them physically unfit in later life, has revealed that it is the *period of adolescence*. (7 to 17 yrs.). Therefore, it is most imperative that this period of life, period of growth to maturity, should be nursed, attended, and nurtured after. All programmes and plans to execute the aim of a health policy must be directed to improve—

"the individual and community life of the future; to insure a better second generation, and a still better third generation: and to promote a healthier and fitter nation and race."

This health policy must be executed by a well planned health programme,* including maternity and child welfare schemes. For the rising generation, the health of women is of utmost importance, more than that of men.

The present child welfare scheme must be made more active, more attractive, and more useful to society. Its services should be available to any one, irrespective of economic or social status.

Health is intimately connected with nutrition, which is largely a question of economic distress and poverty. Therefore, serious attempts should be made to improve the standard of living of the masses.

It is for the Inter-University Board, for the Universities, and the medical profession, to suggest the necessary changes, in the existing order of affairs. The problem before their earnest attention to-day is:

*"whether education is to be used as a means of making good human beings, or a particular type of thinker, needed by the State at the time, or whether the administration and direction of education is to be strongly centralised in a small group of people, who can easily have a mistaken conception of what is best for the nation."*¹¹

The general physical state of the population has been disclosed by sickness surveys, by examinations for life insurance, for military service, and industry. The statistics, derived from these sources, show that the average man presents a number of important and common physical defects and impairments, the correction of which would prove distinctly beneficial.

We need a State preventive health policy, where there is none at the moment. It was recommended by the SKEEN Committee, in 1927, that

"a definite policy should be laid down to improve the physical fitness of the Indians."

* My article in the *Antiseptic*, June '44.

11. Report of Sir Radhakrishnan's Speech, Hindu, Nov, 1939.

This still remains a wishful thinking.

To carry out the objectives of the health policy, to improve the health and raise the standard of physical fitness, research work along the following lines will have to be carried out, viz.:—(a) assessment of state of nutrition; (b) determination of norms for heights, weights and age, and that of physical fitness standards; (c) chalking out of a *satisfactory* diet card for every individual. *Balanced* diet is costly and impracticable for the man in the street.

I venture to suggest that my scheme of medical examination^{1,2} and notes would be helpful to the authorities concerned. The success or failure of the educational authorities in this matter would depend to the extent that they give the correct answer and the right lead to these vital questions, at the present period of renaissance. "If it were done, 'twere, well, it were done quickly."

Appendix I.

1. Diseases causing rejection of the recruits to the Indian Army.*

	1938-'39	1937-'38	1936-'37
Percentage rejected	45.4 %	35.73 %	36.89 %
Common causes of rejection :			
Trachoma	5.6 ..	5.86 ..	4.45 ..
Disordered action of heart	4.8 ..	4.16 ..	3.62 ..
Otitis media	3.0 ..	2.62 ..	2.29 ..
Malaria	2.4 ..	2.41 ..	2.29 ..
Defective vision	5.0 ..	1.91 ..	1.76 ..
Valvular disease of heart	2.2 ..	1.34 ..	1.70 ..
Hernia	0.7 ..	—	1.57 ..
Venereal disease	1.2 ..	—	1.57 ..
Varicose veins	1.9 ..	—	1.08 ..
Pulmonary tuberculosis	0.2 ..	—	0.69 ..
Other defects	5.2 ..	—	11.78 ..

2. Causes of rejection of recruits to the U.S.A. Army.† (New York State, 1939)

Percentage rejected	32.5 %
---------------------	--------

N.B.—This rejection of 32.5% is from the age-group (18 to 35 years, unmarried) from schools and colleges, who believed themselves to be physically fit to fight for their country.

The common causes of rejection, in the order of their importance numerically, are:

Defective and deficient teeth ... 23.9 %	Neuro-psychiatric defects ... 3.05 %
Eye defects ... 21.0 ..	Allergy ... 2.37 ..
Height and weight stature ... 15.0 ..	Heart disease ... 1.50 ..
Poor feet ... 10.0 ..	Glandular diseases ... 1.41 ..
Ear defects ... 10.0 ..	Skin diseases ... 1.18 ..
Skeletal defects ... 3.51 ..	Respiratory diseases ... 0.96 ..
Genito-urinary defects ... 3.28 ..	Miscellaneous defects ... 2.60 ..

3. Summary of defects among men drafted in the World War, in the "second million" after May 1, 1918.‡

Total rejection	21 %
-----------------	------

12. Appendix VI.

* Army Health Reports, India, 1938 and 1939. Note the increase in the percentage of incidence is the same as found in my College Health Report—Appendix II.

† J.A.M.A., Vol. 115, No. 15, pages 1883—84, Oct., 1940.

‡ United States Public Health Reports, Vol. 56, No. 2, Jan. 10, 1941.

TABLE I: Rate of physical defects per 1,000 drafted men.

THE COMMON DISEASES OR DEFECTS ARE			
Infectious diseases	... 0.804	Circulatory diseases	... 47.631
Tuberculosis	... 24.30	Respiratory ..	... 4.26
Venereal diseases	... 7.12	Digestive ..	... 51.955
Nervous system diseases	... 14.275	Genito-urinary	... 2.441
Mental alienation	... 15.540	Skin and cellular tissue diseases	... 3.680
Eye diseases	... 12.381	Bones and organs of locomotive diseases	... 93.256
Ear diseases	... 12.897	Congenital malformations and ill-defined diseases	... 47.055
Nasal diseases	... 0.866		
Throat diseases	... 5.710		

4. Estimated number of defects that will be found in the recruits, by July 1, 1941:

According to the Selective Training and Service Act of 1940 (U.S.A.), 1,200,000 men would have to be examined, to meet the quota of 8,000,000 men (expected by July 1, 1941). On the basis of the World War data, the number of defects, which will be noted among the 4,00,000 men, would be as follows:

	Rate per 1,000 drafted men.		Rate per 1,000 drafted men.
Orthopaedic impairments	... 105.3	Defective and deficient teeth	... 24.2
Eye defects	... 53.5	Nervous and mental diseases	... 23.8
Cardiovascular-renal disease	... 47.2	Ear defects	... 14.6
Defects, not elsewhere classified	... 36.2	Venereal diseases	... 7.1
Underweight	... 29.0	Varicose veins, varicocelo	... 6.1
Hernia and enlarged inguinal rings	... 25.8	Goitre	... 5.7
Tuberculosis (all forms)	... 24.3	Hypertrophic tonsillitis	... 3.1
		Asthma	... 2.2

Appendix II

TABLE I: Presidency Colloge Health Examination Report (1939-'40). Madras.

1. Incidence of Pyphysical Defects:

1939-'40	1938-'39	1937-'38	1934-'35
53.0 %	39.2 %	54.8 %	28.5 %

2. Disorders that cause physical unfitness (total numbers).

Diseases	1939-'40	1938-'39	1937-'38	1937-'36	1935-'36
Heart weakness	... 24	10	12	8	4
Lung weakness	... 5	2	9	4	2
Poor physique	... 28	18	9	19	16
Excitable temperament	... 32	8	8	Not	noted
Defective vision	... 47.96 %	52.0 %	45.1 %	—	—
Dental defects	... 24.76 ..	22.8 ..	14.0 ..	14.0 %	—

N.B.—The increase of incidence of physical defects is the same as found in the Army Health Reports.

TABLE II: Bombay University Students.*

	1939-'40	1938-'39	1937-'38	1935-'36
"A" class	... 45.7 %	47.3 %	46.4 %	49.6 %
"B" class	... 53.2 ..	51.5 ..	52.9 ..	48.6 ..
"C" class	... 1.1 ..	1.2 ..	3.7 ..	1.8 ..

Note.—Note the decrease in "A" class and increase of "B"—same as found in my College and Army Health Reports.

Appendix III

Percentage affected—Infants

	MENTAL CONDITION		GENERAL CONDITION	
	Ability of walking	Active	Development	Nourishment
Coonoor	... 2.8 %	1.9 %	3.7 %	7.5 %
Mysore	... 24.4 ..	4.9 ..	22.0 ..	22.0 ..
Madras	... 4.5 ..	17.9 ..	38.1 ..	37.3 ..

Extracted from the Indian Journal of Pediatrics, Vol. VII, No. 28, Oct., 1940.

* Health Report, University of Bombay.

Appendix IV Physical Fitness Statistics

1. State of Nutrition English Standard.

	Indian Students* (16-20 years)	English Boys (below 16 years).
Excellent	... 8.7 %	14.6 %
Normal	... 60.0 ..	74.1 ..
Sub-normal	... 24.2 ..	10.6 ..
Bad	... 7.1 ..	0.7 ..

2. Livi's Index of nutrition between 17 and 21 years.

South Indian Students	... 2.10†	Javanese	... 2.25	Quoted from the Calcutta Univer- sity Students Welfare Commit- tee Report, 1930
Bengal Hindus	... 2.22	Japanese	... 2.37	
Mysore Students	... 2.25	Belgians	... 2.37	
High Caste Hindus	... 2.26	Dutch	... 2.37	
Lower Caste Hindus	... 2.25	English	... 2.38	
Red Indians	... 2.43	Swiss	... 2.39	
North Chinese	... 2.39	Jews	... 2.39	
South Chinese	... 2.29			

3. Livi's Index for Age 12.

Madras Corporation Schools	... 2.41 †	Mahratta Boys in Bombay	... 2.21 †
Bombay	... 2.15 ..	New York Corporation School	... 2.21 ..
Bengal	... 2.23 ..		

N. B.—I have selected the 12th year since this is the average age when the boy settles to reading and understands the education given to him in the real sense.

It is evident that our Indian boys and students have a lower index than other nations.

4. Physical fitness statistics of South Indian Students, (16-20 yrs).

VITAL CAPACITY OF LUNGS		
Hindu Brahmin	... 2.05 to 2.92 lits.	Average 2.48 lits.
Hindu Non-Brahmin	... 2.29 to 2.66 ..	" 2.47 "
Indian X-ian	... 2.00 to 2.34 ..	" 2.17 "
Muhammadan	... 2.15 lits.	" 2.15 "
Anglo-Indian	... 3.02 to 3.78 ..	" 3.40 "

Average for all the South Indians 2.53 lits.
 " Bengali Students 2.68 lits. †
 " American " 4.00 nearly. ||

All the above figures are mine.

Appendix V

Short notes on physical education and training, in schools and colleges:

The defects in the present scheme of physical education and training are:—(1) Lack of interest and enthusiasm among the pupils, for exercises; (2) Lack of interest among school-managers and colleges, regarding, exercises and health of pupils; (3) Deletion of gymnasium and its exercise value from the curricula; (4) Present day costly games and athletics; (5) Present day games and sports, not suited to indigenous tastes, sentiments and outlook on life; (6) Poor economic conditions of the pupils and students. (7) Slow degeneration of physical fitness and body-build of pupils; (8) Absence of adequate medical examination of pupils, to determine his state

* These data are the averages of 2,000 South Indian students judged by myself, according to the latest British standard of assessment and computation. The figures for the British boys are taken from the Report of the Chief Medical Officer, Board of Education, England 1937.

† Denotes my own research work figures into the physical fitness of South Indians.

‡ Report of the Calcutta University Students' Welfare Committee.

|| Capt. B. T. Krishna's article in the I.M.G., 1932.

of health and physical defects; (9) No definite policy to bring physical training into the realm of body-politic of real education; (10) Present day administration of physical training is defective, and not conducive to organised and systematic work with assured benefit to the population and the community.

The principle—*Mens Sano Incorpore Sano*—has been ignored.

My Suggestions to rectify the above defects:—(1) A regular and systematic health examination of all youths, with an aim to insure health, with a follow-up policy (vide Appendix VI). (2) A physical educational policy, suited to Indians to be chalked out. (3) The individual child must be made the basis of the whole health programme. (4) Physical education and training must begin in the elementary schools, and sojourn into the higher classes, in a gradual and systematic method, till the physical training activities become merged into the community health and hygiene problems. (5) Graded, regular, and systematic exercises, daily to be given to all pupils and students, after adequate medical examination. (6) Provision of enough play-grounds, as the present play grounds are hardly well-equipped. (7) The following acts should be legislated:—(a) Indian Physical Training Act, on the model of the British Physical Training and Recreation Act 1938. (b) Public Health Act to ensure the supply of pure foodstuffs to children. The Madras Public Health Act (the first one in India), has hardly paid any important attention to this aspect of health question unlike other Acts, in England and America. (c) Report of weekly census of mortality-rate of the scholastic populations (school-going age), to study the causes of infantile mortality, and take necessary steps. This should be a special report, issued by the Public Health Departments. (8) A sufficiency of full-time paid physical instructors to carry out the physical training policy, as adumbrated above. (9) Teachers to be trained in gymnasium, games, athletics, and other remedial exercises (Swedish drills and Indian asanas), as an objective course. (10) Military drill to be made compulsory for all colleges. (11) Propaganda to carry on physical fitness campaign, as in England and foreign countries.

Note.—For fuller information, refer my article, *Journal of Madras University*. Vol. XI. No. 1. Jan. 1939.

Suggestions to improve the health and physical fitness of the College students:—(1) Medical examination of students to be extended to all classes in the college—from 1st year to 5th year. This would naturally lead to a following-up policy. (2) The present medical inspection schedule forms require modification, so as to be in conformity with that advocated by the Inter-University Board, India, in 1931. (3) A small health clinic for each college, with a College Health Committee to be instituted, for the small sum of Rs. 50/-per annum. The objection that this medical service to students is possible only in residential colleges, and not like those affiliated to the Madras University, should be over-ruled in the interest and welfare of the students. (4) Gymnasium classes should be re-introduced and all Colleges must be made to provide themselves with gymnastic apparatus, out of the "game fees" collected, which has been rightly or wrongly called an impost on the parent.

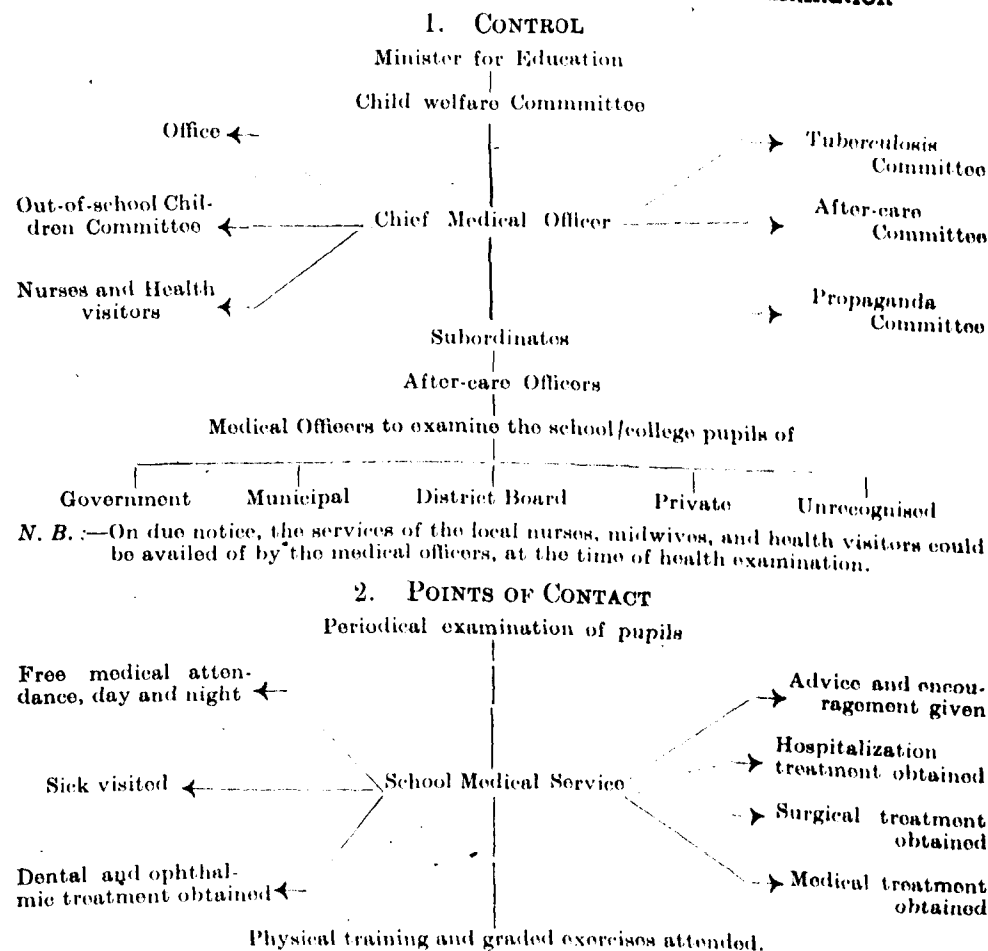
N. B.—The Board of Education, England, has recommended that at least 2-3 hours a week should be devoted to gymnasium, apart from the playing of sports and games, in school-hours, to build physical health.

(5) The University Training Corps should be made more attractive, and popular, so as to make it available to all classes of students; only 600

students are admitted out of a students' population of 13,000 and odd in Madras. (6) The large expenditure on "physical education"—synonymous with playing of sports and games should be better utilised, with real benefit and permanent advantage to the students of the University. (7) An annual report on the health of the University students should be published regularly. (8) The compulsory playing of games, which go by the name of physical training to-day, for the first two year classes should be extended to all classes in the College—from the 1st year to 5th Year Honours classes.

Appendix VI

Scheme of School Medical Service and Health Examination



This is a self-supporting scheme, based on voluntary contribution of As. 8/- per pupil, as at present. For the school going population of the Madras Presidency, it is estimated that 500 doctors would be required to cover an area of 247.8 sq. miles: each doctor serving 6,000 children. There is no extra financial burden to the Government or to the institution. By inaugurating this scheme of school doctors which is intended for insuring the health of the children, not only the expenditure on public health and medical departments will be reduced, but also one would have built a healthier and fitter generation, fit for any walk of life. For fuller information, refer my article in the *Journal of the Madras University*, Vol. X No. 2 Dec. 1938.

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NAVITOL MALT COMPOUND Each fluid ounce contains 5,000 Units Vitamin A, 800 Units Vitamin D, 1 mgm. Vitamin B₁, 2 mgm. Vitamin B₂, 10 mgm. Niacin Amide, combined with Dicalcium Phosphate. In bottles of 8 oz. and bottles of 1 lb.

VIGRAN CAPSULES Each capsule containing 4,000 Units Vitamin A, 400 Units Vitamin D, 1 mgm. Vitamin B₁, 2 mgm. Vitamin B₂, 30 mgm. Vitamin C, and 10 mgm. Nicotinic Acid. In bottles of 25 and bottles of 100.

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" Boric	0-15 "	Choloroform Pure	3-6 "	Pot. Acetas	4-2 "
" Carbolic	2-14 "	" for Anæsthesia	3-6 "	" Bromide	2-12 "
" Citric Ind. 2/8 Eng	4-8 "	Cal Gluconate	8 "	" Citras	4-1 "
" Salicylic	2-14 "	" Carbonate	1-10 "	" Iodide	9-8 "
" Tannic	12 "	Ext. Ergot. Liq	12 "	" Permag loose	5-8 "
" Tartaric loose	6-12 "	Ferrous Sulphate	2-7 "	Silver nitrate	2-10 oz
Argirol	2-8 per oz.	Formalin	2-7 "	Soda Benzoate	3-14 lb.
Ammonium Bromide	4-14 lb.	Ferri Ammon citras	3-14 "	" Bicarb	0-10 "
" Carbonate	1-12 "	Glycerine	1-6 "	" Sulpho carle	3-8 "
" Chloride	1-12 "	Gum Accasia	1-8 "	" Biphosphate	3-0 "
" Benzos	8-14 "	Guocol Carb	1-10 lb.	" Bromide	5-0 "
Bismuth Carbonate	11 "	Hexamina	3-14 "	" Citrate	3-10 "
" Salicylas	11 "	Iodine	11 "	" Pot. Tart.	3-14 "
" Subnitrate	9-14 "	Kaolin	1-12 "	" Salicylas	2-10 "
Buratin	2 15 oz.	Lead acetate	2-6 "	Sulphanilamide Powder	15-8 "
Borax	0-13 lb.	Magnesium Carle Light	1-14 "	Zinc Sulphate	1-8 "
Barium Chloride	2-10 "	Mercury Bichloride	14-8 "	Vaseline White	1-7 Tin.
Calamine Preparata	1-14 "	Methyl Salicylate	3-8 "	" yellow	1-3 "
Calcium Gluconate	7-2 "	Methylene Blue	1-7 per oz.	Our Retail Licence No. 2435.	
Calomel	14-4 "	Oil Eucalyptus	3-8 lb.	Rate per lb. unless otherwise stated.	

Syringes Sup. Cap. 2 5 10 20 cc.
All glass Nak. 8-8; 12-12; 19-8; 23-14
Needles Record Mount. Eng. 4-8; Sup. 5-8;
Gl. Mt. 8-8 doz.

Serum Needles Stainless Rt. 12 doz.
long 4" 1-6; 5" 1-15; 6" 2-12
Saline (Weintraud) Needles each 2-2 [4-8 doz.
Lumbar puncture Needle 5-8; Suture Needle
Adapter each 0-11; Needle file each. 1-15
Thermometer 1/2 mt. Eng. 1-12; Zeal 2-6
Saline Appt. Com. 300 c.c. 9-8; 500 c.c. 13-8
Saline Cholera App. Rogers Comp 19-8
Slides Micro 5-15; Amer 9-12 gr.
Cover Slips 11-12 oz.
Albuminometer Esbach's 3-6;
Litmus Paper 1-0; Sup. 3-4 pkt.
Urinometer 1-7; Sup. 5-0; Trial Jar. 0-12
Urine Test Glass 6 oz. 1-12; 8 oz. 2-0
Ureometer-Doremus-Uricometer Ruheman
Saccharometer Carward. 8-8; Sup. 15-8 [14-8
Pathological & Bacteriological
Blood Capsule Wright 1 c.c. 1-4; 2c.c. 1-8; doz.
Blood Sedimentation pipettes Westgreen 3-14
stand for 3 6; for 6 8-12
Blood Taking Needle automatic. 3-8;
[St. Needle 0-10
Blood Urea apparatus comp. 29-8
Centrifuge Machine 2 tube 31-8; 4 tube 46-8
Glass tube plain 0-3; Graduated 0-6 Metal
Hæmocytometer Sing 69-8; Double 79-3 [3-14
Pipettes RBC. WBC. 5-8; Cover glass 2-13
Hæmoglobinometer Gowers 105- Pipet 20 cm.
Hæmometer tube Graduated Sq. 14-8 [5-6
Ryle's Duodenal Tube Ind. 6-8; Sup. 14-8

KAHN'S TEST OUTFIT—

Copper Rack 8-12; Tin bath 2-12
Antigen dilution tubes 1-4 doz.
Test tube rimless thick 75x10 mm. 0-15 doz.
Thermometer 110 c. 12-14 [100x12 mm. 1-3 doz
Erlenmeyers Flask 250 c.c. Ind. -11; Sup. 2-3
Pipet 1 or 2 c.c. 1/1000 Ind. 2-8; Sup. 6-8
0-1 or 0-2 c.c. 0-001 or 1-5 or 0-25 c.c.

DREYER WIDAL TEST—

Agglutination tube Intl. -15 doz. Sup. 1-4
Dilution tube 3" x 3/4" 0-10 doz. Cop. rack 4-8
Dreyers Pipette -15 each.
Weintraub Tube Adam's 4-12
Fuschin Basin Grentoin Voilet { 4oz. Solution
Leishman, Mithylene Blue } Ind. 6-8
Benedicts Sol. Qualitative & Quantitative
Fahling Sol. No. 1 and 2 lb. Eng. 4-4 [3-12 lb.
Cedarwood Oil oz. 3-12; Zylol Eng. 9 lb.

Blood Pressure Instrument Eng. 155/-

Feeding cup porcelian 1-2;
Mortar & Pestle No. 1-1/-; 2-5/8/-; 3-6/-; 4-7/8/-
Hæmoglobin Scale Book 2-0
Surgical Gloves Ind. 2-2 pair
Measure Glass 2 dr. 0-15; 4 oz. 3-4; 8 oz. 3-8
Trays kidney 6" 2-8; 8" 2-4; 10" 3-6
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Cases and Comments

A Case of Malaria with Jaundice

DR. H. P. DATTA,

A.M.O., K. E. M. Dispensary, Bajag. (Dt. Mandla), C.P.

An unusual form of malarial epidemic was noticed during the months of August and September, 1944, raging in this hilly tract, mostly affecting children under 10 years, the prominent symptom being jaundice complicating the fever. In all I came across about 2 dozen cases of this type. An infective nature of the condition was noted in two families consisting of 3 and 2 children respectively who were found to be suffering from jaundice ranging from mild to severe type associated with fever. In the latter instance, one female child aged about 5 years expired without any treatment whatsoever during her short illness of about 7 days, on account of hyperpyrexia. In still another case of a female child aged about 3 years, cholæmia ended the picture after a protracted illness lasting 1½ months during which period treatment was an interrupted one.

Here I propose to cite a case, who was more or less under constant care, with the hope that it might prove interesting to the readers.

P., aged about 4 years, was suffering from an attack of 'fever' since 17th August for which he was given Quinine by mouth for about a week. On 23rd August afternoon temperature rose to 103°F., for which I. M. Quinine Bihydrochlor (B.C.P.W.) 2½ gr. was administered well diluted with sterile distilled water. As there was slight naso-pharyngeal catarrh and bronchitis—Mandl's paint for throat and mustard plaster for the chest was ordered. The fever was controlled. Then usual Quinine mixture was continued for another 10 days. But from 29th August he began to run temperature again and on 2nd September he had bilious vomiting about 23 in number and constipation.

On 3rd September the patient was brought to me with the history of fever, œdema over the feet, hands and face pitting on pressure and inability to stand or walk. I examined the boy and found the condition as follows: Boy emaciated, anæmic, looking dull and apathetic, face—puffy, abdomen protuberant due to chronic enlargement of liver and

spleen—3 & 4 fingers, below the costal margin respectively and flatulence. Shifting dullness not present.

Pulse—rapid and weak, heart—rapid—systolic thrill—over the præcordia, most marked in (P) region & hæmic murmur present, temperature 103.4°F., superficial lymphatic glands—cervical (posterior triangle), axillary and inguinal—enlarged soft, distrete and tender on both sides, costo-chondral junctions were prominent, tongue was moist, red-tip and side and furred in the centre, faeces—pale in colour.

Previous-history: glands are chronically enlarged since birth. Malaria off and on since 3 years and threadworm infestation which is still persistent.

Treatment:—I. M. Quinine 2½ grs. to control the fever and following mixture for dropsy—

℞ Pot. Acet.	gr. v.	Tr. Digitalis	℥ v.
Pot. citras	gr. v.	Tr. Hyoscyamus	℥ v.
Liq. Ammon. Acet.	℥ xxx.	Aqua anisi ad	℥ iv. T.D.S.

This was stopped after 3 days when dropsy disappeared. The fever, which had come down next day (4th Sept.) now became remittent, rising in the evening accompanied by bilious vomiting in the night 2, 3 in number. It did not completely subside on exhibition of Quinine by mouth and slowly the picture was complicated by the appearance of jaundice which became intense on 17-10-'44. Conjunctivæ and m.m. of the mouth-blanché and deep yellow. Skin of the whole body especially the temples, nape of the neck also yellow. Pulse—slow, urine—sp. gr. 1050. Marechal's Tincture Iodine test for bile pigments—positive. Test for albumin—negative.

The above condition responded well to the following:—

1. ℞ Hexamine	gr. v.	Soda Benzoas	gr. x.	Ext. Cascara Sag	℥ x.
Soda Salicyl.	gr. v.	Soda Tartrato	gr. x.	Ext. Taraxaci Liq	℥ x.
Soda Citras	gr. x.	Tr. Rhoi co	℥ x.	Aqua anisi ad	℥ i. T.D.S.
2. ℞ Hydrarg with Creta	gr. i.				
Pulv. Creta Aromat	gr. v.	B.D.			

together with plenty of liquid nourishing diet.

The fever and vomiting subsided, urine became copious, test for bile pigment—weaker day by day. Appetite increased and the boy became a bit active.

On 25-9-'44—Liver was found to be 3 fingers and soft and tender. Spleen—just beneath the costal margin. Heart—systolic thrill & murmur present—Bradycardia—Faint icteric tinge of skin and conjunctivæ present. The examination on 28-9-'44 revealed—liver to be 2 fingers and spleen 1 finger which ratio still holds good uptil now. The temperature noted was 97.4°F. Now he has been put on a mixture containing iron viz:—

℞ Ferri et Ammon citras	gr. v.	Aqua Mist. Chiretta ad	℥ iv.
Spt. Ammon aromat	℥ v.		T.D.S.

He is now better although there is no change in the condition of liver, spleen and lymphatic glands.

Discussion.—In the above cited case the prominent symptoms noted are:—(1) History of residence in the endemic area with bouts of irregular fever off and on since last 3 years; (2) Marked anæmia; (3) dropsy; (4) jaundice; (5) chr. enlargement of spleen and liver and of superficial lymphatic glands; (6) presence of bile pigments in the urine. The above picture may well be confounded with other conditions in which hepato-splenomegaly is a constant or most important feature such as:—(1) yellow-fever; (2) black-water fever; (3) Kala-azar; (4) relapsing fever; (5) Weil's disease; (6) Gaucher's & Banti's disease; (7) Infantile cirrhosis of the liver; (8) congenital syphilis;

(9) rickets. In addition lymphatic enlargement may give rise to suspicion of: (10) lymphatic leukaemia; (11) lymphadenoma; (12) tuberculous lymphadenitis; (13) glandular fever; and possibly (14) Bubonic plague.

Clinically it is rather difficult to clinch a diagnosis but proper evaluation of (1) history, (2) age incidence, (3) course, and (4) reaction to treatment together with absence of special features of above diseases point to the case being labelled as that of 'Malaria with Jaundice.'

M & B 693 in Bacillary Dysentery and Mucous Colitis

NOREN DASS, M.B., D.T.M. (Huron), F.I.C.P.,
Bhisagraha.

In early July last year I had an opportunity to treat a good number of cases of bacillary dysentery and mucous colitis with Sulfaguanadine (Squibb's) and M & B 693 separately and I am now inclined to hold the opinion that M&B 693 gives much better and quicker result than that of Sulfaguanidine; at least I observed this result in the cases I treated. Below I am giving a typical case note for the careful study of my fellow practitioners:

29-7-'44. Tushar Kumar, a boy aged about 11 years, Hindu, healthy, had been suffering from dysentery with mucous and blood for the last 4 days. He was passing 35-40 stools during 24 hours; had temperature 100°F., from the 2nd day of his attack; had also got griping pain in the lower abdomen before passing a stool and tenesmus. He was treated with the following mixture for the first 48 hours:—

℞ Mag. Sulph.	gr. xv.	Acid Sulph dil.	℥ v.	} Ft. Mist. mitte
Sodi Sulph.	gr. xv.	Aqua Cinnamon ad.	℥ i.	

Diet:—Green cocoanut water, glucose drink, plain water, etc.

On the 3rd and 4th day he was given—

℞ Sulfaguanadine (Squibb's) tab.: 6 tabs. Sig. 1 tab. t.i.d. with plenty of water.

Diet as before.

This day (29-7-'44) he was examined and no improvement was found except that the number of stools came down to 25-30 in 24 hours. There was no change in the appearance of the stools nor in the temperature. This day I sent a sample of stool for pathological examination and I received the following report from the laboratory:—

Appearance of the stool sent:—Greenish with mucus and blood.

Reaction, alkaline; Pus cells + + +; Mucous + + +; Epithelium + +;
R B C + +; W B C +; Ova nil; Amœba nil; Cysts nil.

The above report suggests that it is a case of bacillary dysentery with mucous colitis. As I failed to obtain any marked improvement with Sulfaguanadine in course of 48 hours' time I immediately prescribed:

℞ M & B 693 tablets 6. } Sig: To be taken M & B 693 1 tab. with ½ tab. of
Acid Nicotinic tabs. 50 mg. 3 tabs. } Acid Nicotinic t. i. d. with plenty of water.

Diet:—Orange juice, Glucose drink, Green cocoanut water, lemonade, plain water, etc.

With the above treatment a marked improvement was noticed within 24 hours and the patient was alright in course of three days' time. The above treatment was continued twice daily for a further period of 2 days and once a day for 2 more days when the treatment was discontinued. The patient was gradually brought back to buttermilk, barley water, rice gruel and finally to the normal diet of rice with chicken curry etc., in the course of a week.

During June to August in 1944 I had an opportunity to treat many cases of bacillary dysentery and mucous colitis as mentioned above and

also several other cases of entero-colitis with M & B 693 only and all my cases were radically cured in a very short period. I have always noticed a marked improvement with a few tablets of M & B 693 in course of first 24 hours and the patients made very speedy recovery in a few days' time. Plenty of drinks must be advised during the course of M & B 693 treatment to obtain maximum result. I always use Acid Nicotinic tablets with M & B 693 thrice or twice daily to neutralise any probable untoward action of the drug. By this line of treatment I have never experienced any reaction of M & B 693.

Re: diet, during first 24 hours I always put the patient on plenty of plain drinks only, i.e. green cocoanut water, glucose drink, sugared water, lemonade, whey water etc. After this period I gradually allow barley water with sugar and lime juice, orange juice, buttermilk and then Horlick's or Nestle's Malted milk, semi-solid food and finally the normal solid diet.

I advise my fellow practitioners to try M & B 693 in cases of entero-colitis, mucous-colitis, and in all varieties of bacillary dysentery in preference to Sulfaguanadine and where Sulfaguanadine fails and I am inclined to believe that they will be able to obtain the most gratifying results.

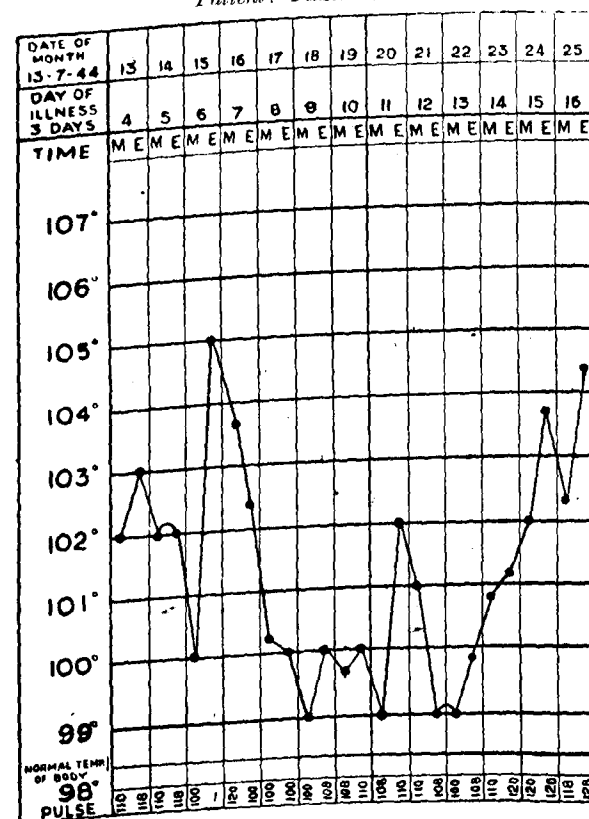
A Case of Meningococcal Meningitis

B. GUNAWARDENA L.R.C.P. & S. (Edin.), L.R.F.P. & S. (Glas.),
District Medical Officer, Madulima, Ceylon.

Meningococcal meningitis gives rise to certain typical signs and symptoms which are characteristic, and with these signs and symptoms fully developed there will not be any difficulty to diagnose a case of meningococcal meningitis. The case I am quoting below is interesting in view of the fact that all the classical signs and symptoms of the disease were not present at least at its early stages which masked its diagnosis for a few days. The rarity of the disease in this country is another factor which had delayed the diagnosis. In fact, for the last 17 years, this was the first case of meningococcal meningitis the writer had come across. I am giving below the full history and the case notes and the line of treatment adopted and the nature of the various diagnostic tests etc., done, as this may interest the readers. I am also annexing the temperature chart. P., female, 12 years, who had not yet attained puberty and who had been living in a malarial district was admitted to this hospital on 13-7-'44. She was well-nourished and on admission had a temp. of 102°F. with a pulse of 110. A history of loose motions was also given. Blood film examined for M. P. gave a negative result. One was compelled to think of malarial fever to start with in view of the nature of the malarial district from which she came and also in view of the fact that her mother informed me that she had been having an attack of fever with chills about a week ago and which passed off practically with native treatment given without giving rise to much trouble. She had a slight cough. Lungs showed a few scattered rhonchi with prolonged expirations over both. Stools contained a trace of mucous but no blood. The writer diagnosed the case at this juncture as one of malarial fever with a possible malarial enteritis complicating it. Mepacrine one tablet t.d.s. and mist. Saline was ordered and the patient was put on a light diarrhoea diet. She was admitted at 9 a.m. and in the evening the temp. rose to 103°F. with a pulse of 118 and the patient complained of chilliness. This made me to give her a Quinine injection grs. 15 of Q. B. H. intramuscularly. The following morning temperature was 102°F. and the pulse was

110 and she vomited two round worms. I put her on 2 grains Santonine with $\frac{1}{2}$ grain Calomel and five grains Soda Bicarb. and about 8 hours after gave her a Saline bowel wash. No more worms were passed however. E. T. 102°F., pulse 118. There was a certain amount of headache. Aspirin ten grains was ordered for the night, which relieved the headache and made her sweat and sleep the night well. Differential blood count was done and this showed polymorphs 85% and lymphocytes 15%. On 15-7-'44 the patient was restless and became a little delirious with a M.T. of 100°F. and a pulse of 100. Stools continued to be watery but due to the saline mixture was getting a little clear of its mucous. Occasional vomiting was present. Glucose water was given ad lib by sips and a saline bowel wash was repeated. A

Patient: PREMAVATI.



On 13th admission; 14th Inj. Q.B.H. gr. x given; 16th Soluseptasine given, Lumbar puncture done; 17th Calcium given I.V., Soluseptasine given I.M.; 18th Lumbar puncture done, Soluseptasine given I.M.; 20th Grape sugar 25 c.c. given I.V.; 21st Soluseptasine given I.M.; 22nd Soluseptasine given I.M.; 24th Blood for Widal; 25th Lumbar puncture done.

of the abdomen. Kernig's was not present. She passed p.r. several round worms on this day. B.P. 122-70. The matron at this stage showed me a superficially infected wound over the right knee and the patient's mother gave a history that the girl had a fall in school about 10 days ago. The wound was, however, quite superficial. Anyway to be extra sure lest I may miss a diagnosis, I gave the patient 3,000 units of anti-tetanus serum hypodermically. E.T.

mixture of Quinine Bihydrochloride grs. 10, Vinum Ipecac ms. 7½, Tinct. Stramonium ms. 7½, Sodii Bromide grs. 15 and Aqua ad 1 oz. was ordered to be given three times a day. Same day E.T. 105°F., pulse 120, and the patient became more delirious. He was ordered to the head and she was cold sponged to bring down the temperature, and the state of delirium continuing an injection of Hyoscine Hydrobromide grs. one over 200th was given hypodermically. This injection however did not put her to sleep nor was the state of delirium relieved. 16-7-'44 M.T. 103°F., and there was slight nausea but no vomiting and slight delirium. Only on this day in the evening did meningeal symptoms come on, viz., cry there was an occasional which was not however of the typical meningeal type and there was a certain amount of retraction of the head. The neck was stiff. There was no stiffness of the back nor was there any signs of rigidity

102.4°F., pulse 120. Later in the evening I decided to do a lumbar puncture. C.S. fluid was turbid but did not come out under pressure. A specimen was collected and sent for bacteriological examination and report early. Also at this stage I communicated with the physician, Badulla Hospital, and requested him also to come over and see the case. From the nature of the C.S. fluid I gave up the idea of the case being one of tetanus any further and tried to push on M & B 693. Three tablets of this mixed with Sodii Bicarb was given four times a day. I also gave her an intravenous injection of Calcium Sandoz. On 17-7-'44 the physician, Badulla Hospital, Dr. H. GOONEWARDENA came over and very kindly went through the case carefully with me and he came to the conclusion that this was a case of meningitis, but however he was not quite sure what variety of meningitis it was and we decided to push on M & B treatment. The dose was increased to 4 tablets. Nausea increased with the increase in the dose of M&B and I gave the M & B with Nicotinic Acid tablets one added to each 4 tablets. This however overcame the nausea back to Badulla and 'phoned me up to say that the C. S. fluid specimen showed meningococcal plus and also there were red blood cells in the C. S. fluid. The diagnosis now no doubt was confirmed and the treatment was carried on vigorously for meningococcal meningitis. I tried to obtain meningococcal serum but it was not available anywhere. I gave however Dagenan injections intramuscularly daily and also pushed on the M & B by mouth. She was put on Glucose by mouth ad lib. On 19-7-'44, the neck rigidity increased to a greater extent.

21-7-'44: The pulse began to be a little feeble and I ordered a mixture of Sodii Citratis grs 25, Tinct Moschi ms 20, Sanmetto ms 20, Spiritus Aether's Nitrosyl ms. 10, Aqua ad 1 oz t.d.s., and M & B 693 was continued, 3 tablets t.d.s. 24-7-44: Patient passed another round worm. 25-7-44: Lumbar puncture was done again and it was again found that it was not under tension. C.S. fluid, however, was still cloudy. I gave an intramuscular injection of Crooke's Collosol Argentum. On the 25th however the condition of the patient was not good. I noticed a failing pulse and tried everything in the form of heart stimulation etc. On 25th evening the temperature again began to rise too and the patient died the same night.

I would like to touch on the differential diagnosis of this case and the various conditions that it may be reasonably mistaken for. First it may have been reasonably mistaken for an attack of cerebral malaria, especially in view of the fact that the patient is a subject of this fever. The high temperature, feeling of chillness, headache are all characteristic of cerebral malaria. The presence of the head retraction is nothing rare in cerebral malaria. I believe that when other conditions are also suspected there is no harm in giving this patient an injection of Quinine. I have seen cases of ascarial infection of severe types develop a severe toxæmia with head retraction and vomiting as was in this case and hence my pushing on Santonin treatment so vigorously. Tetanus—there was a wound however trivial it may have been which fact could not have been overlooked and in this too there were no classical signs and symptoms in full of tetanus and I believe that there was no harm in the patient having had an anti-tetanus injection. Typhoid fever with meningeal symptoms to begin with. Then the pulse temperature ratio was not at all in favour of this. I had the blood examined for widal and it gave a negative result.

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No. 2.

Post-Graduate Medical Education

THE decision of the Madras University to form a Council of Post-Graduate Education and impart post-graduate training in medicine and surgery to its alumni is indeed a very laudable one. The University is to be congratulated in being practically the very first of its kind in India to be so forward and progressive in its views as to open such a post-graduate course. As DR. SIR. A. L. MUDALIAR said in his speech requesting His EXCELLENCY SIR ARTHUR HOPE to inaugurate the Council, "the busy medical practitioners have neither the time nor the facilities to keep abreast of the times and be up-to-date in their knowledge of the advances made by medical science throughout the world." Medical journals and periodicals do their utmost to keep medical men abreast of the times, but post-graduate courses such as the one recently inaugurated are also very welcome and surely they will be complementary to whatever the periodicals can do.

In his speech inaugurating this Council His EXCELLENCY SIR ARTHUR HOPE referred to the paucity of doctors and nurses in the country in general, and in this Presidency in particular, and expressed his desire that the medical and health services should be improved and augmented to a very great extent. He wanted the Council to try its best to find out what should be done to attain this end in the near future. The Council can only put forward suggestions in this behalf. It is the duty of the Provincial Government, of which His EXCELLENCY is the head, to start more medical colleges and train a larger number of medical men and give them encouragement and incentive to go and settle in rural areas and give medical relief to the rural population who form by far the largest part of the population in this country and who are much neglected. It is true that a large number of medical men will be released from the medical services at the end of the war and after the signing of the armistice, but a great number of these would be required to perhaps man a greater Indian Army that might have to be kept in this country for its defence.

His EXCELLENCY very much appreciated the excellent work that Madras doctors are doing in the various theatres of war and referred with pride to the excellent impression that they are making on their Commanding Officers in the various theatres. This is due to the fact that the standard

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of medical education imparted in the University of Madras is as good as, if not better than, in any other university in this country or elsewhere. The decision of the Madras University to open a post-graduate course to improve the standard of medical knowledge of doctors now practising clearly establishes their desire to still further improve the high standard that it has achieved in this field.

COL. McROBERT who also spoke said that the aim of the Madras University was to provide higher instruction to those who wish to become specialist physicians, or surgeons, taking the higher degrees of M. D. and M. S. by providing basic specialist courses in such subjects as ophthalmology, ear, nose and throat diseases, gynaecology, and venereology, leading to elementary specialist diplomas which indicate that the holders have had sound personal training in the use of special methods and instruments in their chosen field of work. He also stated that the aim of this University was to provide refresher courses for the general practitioner, comprising of work in the wards, out-patient department, and in the lecture rooms. In the course of the speech he asked a pertinent question: "Is the University of Madras, with its constituent colleges in the City, in a position to undertake such post-graduate teaching in addition to the heavy load of undergraduate instruction now being carried out?" and also referred to the increasing strain on the teaching staff, owing to the depletion of its strength due to war service and the retirement of seniors. We are sure that this question can be answered in the affirmative. Clinical material there is in Madras to a colossal extent. The reputation of Madras Surgeons, Physicians, Gynaecologists, Radiologists and Ophthalmologists has spread all over the country. The staff at present is probably well trained and in the interest of the medical profession would not grudge to give some more of their time and leisure for their benefit.

The question that we would like to ask is: whether the present course of post-graduate lectures are suitable to the medical men? For those appearing for the specialist examinations and the higher degrees, we do not propose to hold a brief. They somehow find the time and money to attend these lectures. But can the general practitioners take advantage of these lectures? The programme arranged is such that it will not be possible for them to take advantage of these lectures. In the first place, the time at which these lectures are delivered, that is between 5 and 6 p.m. or between 5 and 7 p.m. is most unsuitable to them, because it is the time when they are generally very busy. We would suggest that these lectures be either held between 2 and 3 or between 2 and 4, or after 8 in the night when they will be free to attend them. This is not a novel suggestion, as in other countries all these post-graduate lectures are arranged more to suit the convenience of the general practitioner.

The second point which we wish to bring out is the fact that the fee for the post-graduate course is at present rather on the heavy side. Whether the general practitioner is interested in surgery, medicine, or obstetrics, he has to pay a fee for the full course. He has therefore no option but to pay for the whole course and attend only that portion which interests him. This could be rectified if a smaller fee is fixed for each particular branch of medicine, or surgery in which the general practitioner is interested. This is only by way of a suggestion, and not a criticism. We are aware that it is not an easy job for the University authorities to organise and conduct these post-graduate lectures. But, for the achievement

of the object the University authorities have in view, it is very necessary that the suggestions we have put forward above should be accepted and acted upon. If this is done we are confident that their splendid efforts will be crowned with success and that co-operation will be forthcoming in an abundant measure from all sides.

One Hundred Years

THE Government Hospital for Women and Children, Madras, has just celebrated its centenary. The Committee of the Centenary Celebrations has printed a Souvenir brochure containing a history of the development of this hospital from 1844 to the present day. From a small Lying-in-Hospital near St. Andrews Church, Egmore, opened on the 26th July, 1844, this Government Hospital, under a succession of able superintendents, has risen to the eminence which it now occupies in the field of maternity and child welfare. Doctors HARRIS, BRANFOT, STURMER, GIFFARD, HINGSTON and Sir A. L. MUDALIAR are some of the names of Superintendents whose reputation and work were indeed great. From 15 confinements in 1844 the hospital is now doing over 5000 confinements per year—a record of which anyone can be proud. It has done a great service to the women and children of this Presidency. As a teaching hospital it is second to none, at any rate, in the Far East. Students from all over India, not to mention from even the Far East, have undergone post-graduate training in Obstetrics and Gynaecology in this hospital. Students who have passed from the portals of this hospital have always been known to be very efficient. At a time when recognition was not given to medical colleges in other parts of India by the General Medical Council, owing to the lack of proper training in midwifery, the Madras Medical College was the only one which had the unique distinction of having its midwifery teaching recognised all over the world, and this was due to the very excellent coaching and clinical training given in this Government Hospital for Women and Children. This hospital has also become one of the largest for the training of midwives, and much credit for this should be given to the Matrons who were in-charge of the nursing section of this hospital.

Some of the great figures in the medical field who have been largely responsible in building up this hospital to its present eminent position are happily still with us, and to them we offer our most sincere congratulations and felicitations. Its alumni are to be met with in every Province and State in India and perhaps in many parts of the world as well. To have been able to do a century of work in any department is a notable achievement, and to have acquired in that process a high reputation which the Government Hospital for Women and Children holds in the Medical world is still a greater one. It is the hope and prayer of all its old alumni that this hospital will win greater laurels in the years to come and that the women and children of this presidency will be ever grateful for its valuable aid and help. We also hope that institutions of this type will receive enthusiastic support at the hands of philanthropic citizens as well as the Governments of the day, in effecting whatever improvements are necessary to maintain and improve its high traditions and excellence.

Gleanings From Medical Press

MEDICINE and THERAPEUTICS

Dysenteries—Diagnosis and treatment.

Bacillary dysentery is by far more common than amebic dysentery. Bacillary is epidemic; amebic is sporadic. Bacillary dysentery, when severe, is a prostrating disease associated with high fever, leukocytosis, and severe toxic effects. The stools of bacillary dysentery are mostly sero-sanguinous pus with albuminous odor, while the stools of amebic dysentery consist of a foul-smelling mixture of feces, blood and brownish, jelly-like mucus. Bacillary dysentery: Sulfadiazine is the drug of choice with sulfathiazole as second. The initial dose of both of these drugs is 2.0 gms. (30 gr.) followed by 1.0 gm. (15 gr.) every 6 hours until symptoms subside or until two successive stool cultures are negative. In severe cases fluids intravenously is usually required to relieve dehydration. Plasma or blood should not be given until dehydration is completely relieved. Antitoxic serum for shiga infections 40-80 c.c. repeated daily until the toxemia and dysentery abate. To relieve the abdominal pain and insure rest, camphorated tincture of opium, codeine or morphine should be given. Vitamins, particularly B and C, should be given freely to replace the loss incident to the disease, to hasten recovery, and to strengthen resistance against recurrences.

AMEBIC DYSENTERY.—Give emetine hydrochloride 1 gr. once a day for 5 days. Beginning on the 3rd day of the emetine therapy give carbarsone .25 gm. by mouth 3 times a day for 7 days. After an interval of 3 days give vioform 0.25 gm. or pulvis chinioformi (yatren), 1 gr. (15 grains) by mouth 3 times a day for 7 days. After another interval of 7 days repeat the course of carbarsone 0.25 gm. three times a day for 7 days when no gastro-intestinal irritation or other toxic effects of these drugs develop. The interval between the courses may be shortened or eliminated.

AMEBIC ABSCESS.—Emetine is a specific for amebic abscess. Give emetine hydrochloride 1 gr. for 8 to 10 days if necessary and if toxic effects do not preclude repeat at intervals of 15 to 20 days. When 6 doses of emetine have been given, start treatment for eradication of the parasite in the intestines by means of carbarsone and vioform as outlined. Aspiration may be required for large abscesses; open operation must be the last resort.—*Hospital Corps Quarterly*.

Care of the unconscious patient.—Respiratory obstruction is the immediate cause of death in an appalling number of unconscious or semi-conscious subjects.

The most common form of respiratory obstruction occurs in the upper tract and is caused by relaxation of the muscles of the tongue and pharynx allowing the soft parts to fall back into the posterior pharynx.

Prevention of this type of obstruction is simple; if the mandible is raised and brought forward, the tongue and soft parts are displaced away from the posterior pharynx.

The next most common form of respiratory obstruction in the upper tract is the collection of secretions mucous, blood, vomitus, etc. The protective mechanisms such as expectorating, swallowing or coughing are lost in the rugged or injured unconscious subject. Ideally, aspiration of this foreign material is desirable if the patient is in the supine position.

Actually, however, apparatus to accomplish this purpose is rarely if ever immediately available and the time lost in obtaining it, even though it is within reaching distance, may cost the life of the patient. Wiping the material out with the finger covered with gauze is advisable, but in most instances not completely effective.

Practically, the patient can be placed immediately in the Trendelenburg position, so that the material will drain into his nasopharynx, or he may be rolled onto his abdomen, or he may be put in the so-called "Sims," "tonsil" or "cerebellar" position in which with a minimum amount of adjustment, the airway may be cleared and kept cleared by gravity.—Hathaway, H. R.: Immediate care of unconscious patient. *J. Nerv. and Ment. Dis.* 99: 636-639, May 1944.—*U. S. N. Med. Bull.*

Diagnosing mild Grave's disease.—The diagnosis of mild Grave's disease is often very difficult to make with certainty, largely because we have no test for thyroid function. The signs and symptoms are those of increased oxygen consumption, which may occur in other disorders, of the associated psychological and autonomic imbalance, which is not necessarily associated with thyroid disease, and the toxic action of excessive thyroid secretion on the heart, which occurs as a rule only in obvious cases. Exophthalmos, the cause of which is not known with certainty, is a notoriously unreliable sign. The further investigations suggested are the B.M.R., which is normally raised, and the blood cholesterol, which is normally lowered; but in all probability the most useful investigation is a period of rest in bed under the eye of a physician. Thyrotoxic patients almost to a woman have hot feet and dislike hot weather. Patients with hyperthyroidism are often unduly excitable, and therefore liable to faint.—*B.M.J.*

Sodium lactate for the prevention of renal complications from Sodium Sulfadiazine.—The authors report their study on 100 patients, chiefly post-operative cases, which showed that alkalization of the urine with M/6 (sixth molar) sodium lactate

solution administered parenterally, prevents crystalluria and renal complications due to therapy with parenterally administered sodium sulfadiazine. The initial dose of sodium lactate required to alkalize the urine at the onset of therapy with sodium sulfadiazine depends upon the degree of acidosis present and varies usually from 500 to 1,500 c.c. of M/6 sodium lactate solution in adults with normal kidney function. Thereafter, 1,100 c.c. daily, divided into two doses administered every 12 hours is usually appropriate to maintain the urine alkaline and prevent crystalluria from the sulfadiazine. The plasma carbon dioxide content is not greatly affected by this dosage of lactate solution. No evidence of clinical alkalosis was observed in their series of patients. It is pointed out that caution must be exercised to prevent alkalosis when attempting to alkalize the urine of patients with nephritis. From the results of studies of the sulfadiazine concentration of the blood following intravenous injections of sodium sulfadiazine, the authors recommend that the drug be administered in the relatively low concentration of 0.5 per cent. in M/6 sodium lactate solution, or certain other parenterally utilizable isotonic solutions rather than in 5 per cent. solution in water. They also suggest that parenteral sodium lactate therapy as prescribed here would similarly be of value in protecting against renal complications from parenteral administration of certain other sulfonamide drugs. (Gilligan, D. R., Dingwall, J. A. and McDermott, W., *Annals of Internal Medicine* 20-604 (April) 1944).—*U.S.O.W.I.*

A clinical study of Hexestrol.—Hexestrol is a synthetic estrogen with the chemical formula di-p-hydroxyphenyl-n-hexane. This substance has previously been found to produce estrus in rats to which it was administered in doses of 0.2 micrograms. This report is based on the parenteral and oral administration of hexestrol over a period of 27 months to a total of 105 estrogen-deficient patients, 80 of whom were in the menopause. In the 80 menopausal patients (61 natural and 19 surgical), hexestrol brought about control of symptoms in all cases, with freedom from side actions in all but two who had slight nausea, which was overcome by reduction of dosage. Clinical response was correlated with biological response by differential staining of vaginal smears. The initial use of parenteral injections of hexestrol until the symptoms were brought under control, followed by minimal maintenance levels of the drug given orally proved to be the procedure of choice, since it produced clinical improvement more rapidly than when only oral administration was employed. Aqueous suspension of hexestrol was superior per unit of weight to hexestrol in oil in being more active and in producing more prolonged effect, necessitating injection only once a week, even in severe cases. The average mean treatment time in the menopausal series was approxi-

mately 11 months. The large total dose given in several cases and the absence of untoward effects demonstrates the relative non-toxicity of hexestrol and its clinical safety when administered under controlled medical supervision. (Ersner, J. S., et al., *Journal of Clinical Endocrinology* 4: 147, April, 1944).—*U.S.O.W.I.*

Non-tropical sprue syndrome.—Sprue goes by a number of names, including "sprue," "non-tropical sprue," "celiac disease," and "idiopathic steatorrhea." A geographical distinction is the only real difference between the tropical and non-tropical forms of the disease. Celiac disease is generally considered the sprue syndrome occurring among children and bears the same relation to sprue that cretinism does to adult myxedema. Even in normal persons, fats are absorbed less readily than are proteins, and carbohydrates are absorbed more easily than either of the other two foodstuffs. In sprue, therefore, in which the primary disturbance is an absorptive deficiency, it is readily understandable that inadequate absorption of fat should be responsible for so many of its symptoms.

In the active stage of the disease stools are frequent and are said to be bulky, greasy and foamy, but just as often may be liquid and brown or they may have the appearance of dirty dishwater.

That vitamin K is improperly absorbed is evidenced by the frequency of the hemorrhagic diathesis and by the finding of an elevated prothrombin time, when the disease is active.

The metabolism of calcium may be interfered with, and it is probable that all substances, even water and gases, are absorbed poorly.

That the vitamin B complex is grossly deficient is evidenced by the frequency of appearance of such symptoms as cheilosis, angular stomatitis, pellagra-like lesions of the skin and a fiery red tongue. The vitamin C content of the plasma is significantly lowered.

A hyperchromic macrocytic or a hypochromic anemia characteristically accompanies sprue.—Wildor, R. M., Jr.: Non-tropical sprue syndrome: Report of four cases and of case in which intestinal insufficiency was corrected by operation. *Proc. Staff Meet., Mayo Clin.* 19: 297-302, June 14, 1944.—*U. S. Na. Med. Bull.*

Meniere's Syndrome.—There seems to be a definite pathologic picture in Meniere's syndrome which consists of dilatations of the endolymphatic system with dilations of the cochlear duct, but not of the semicircular canal. There is also a fibrosis of perisaccular tissue. These changes probably cause a disturbance in the secretion of the endolymph with the predisposing factor being the fibrosis of this perisaccular tissue. It is thought that the vestibular

symptoms may be due either to a lowered or an increased vestibular function, and that the auditory disturbances are due to a distortion of the sacule and of the cochlear duct. As yet there is no certain medical cure. However, phenobarbital, histamine intravenously and various diuretics may benefit one-third to one-half of the cases. Histamine is not specific and is only a useful adjunct in therapy which frequently fails. The occurrence of tinnitus may persist even after section of the auditory nerve. Surgery should always be a last resort to be delayed as long as possible.—*North-West Medicine*.

Thiouracil.—Thiouracil causes a decrease in the protein-bound iodine of the blood and in the thyroxine iodine of the thyroid gland, but does not inhibit the hypermetabolic effects of performed thyroxine. These facts indicate that thiouracil inhibits the production of the thyroid hormone, but the exact process by which this is accomplished has not yet been determined. The drug can be depended on in essentially all cases to lower the basal metabolic rate to a normal range and to maintain it at that level so long as treatment is continued. Associated with this response in the basal metabolic rate is a clinical remission of the disease, with disappearance of tachycardia, hyperidrosis, nervousness, diarrhoea, weight loss and other toxic manifestations.

By accurately regulating the dosage of thiouracil it is believed that the goitrogenic effect can be kept low. In spite of the fact that many thyroid glands have decreased in size with treatment, it is not considered advisable to give prolonged thiouracil treatment to a patient who has an extremely large gland, since there is some possibility that the gland will actually become larger.—William, R. H., and Chute, H. M.: Thiouracil in treatment of thyrotoxicosis; report of seventy-two cases. *New England J. Med.* 230: 657-667, June 1, 1944.—*U. S. Na. Med. Bull.*

Sulphamerazine: clinical evaluation in 116 cases.—Hollander Spink (*J. A. M. A.*, 123, 1943) give in the following lines the summary of their observations: 1. Sulphamerazine was administered to 116 patients having a variety of clinical conditions. Fifteen of these patients were infants under one year of age. 2. Sulphamerazine appeared to be as effective as sulphadiazine in the therapy of 40 cases of pneumococcal pneumonia or bronchitis. Sulphamerazine was less effective than sulphathiazole in the treatment of staphylococcal sepsis. Thirty-three patients with streptococcal infections responded as well to sulphamerazine as a comparable group did to sulphadiazine. 3. Two cases of meningitis due to type B influenza bacilli and three patients with meningococcal meningitis recovered with sulphamerazine. 4. Compared to sulphadiazine, when sulphamerazine was given orally adequate blood concentrations necessitated smaller doses

given less frequently. 5. Sulphamerazine does not appear to be any more toxic than sulphadiazine. The drug did not produce any demonstrable neurologic complication. Sulphamerazine caused less nausea and vomiting than sulphapyridine, and fewer skin eruptions and instances of drug fever than sulphathiazole. 6. Two instances of non-fatal urinary tract complications were produced by sulphamerazine. The complication appeared due to the extrarenal precipitation of crystals resulting in the mechanical obstruction of a free flow of urine. There is evidence that an adequate fluid intake and alkalization of the urine may prevent such complications.—*G.P.*

A non-hemolytic streptococcus and primary atypical pneumonia.—Streptococcus MG, a nonhemolytic streptococcus was isolated from the lung tissues of 6 of a total of 8 patients who died of primary atypical pneumonia, and was not obtained from the lung tissues of 6 patients who died of other causes. It was isolated from the sputum or throat swabs of 53 of a total of 97 patients with primary atypical pneumonia, and 20 of a total of 82 patients with other acute infectious diseases, as well as 7 of a total of 57 normal persons. It was found that 67 per cent. of 193 patients with primary atypical pneumonia developed during convalescence antibodies directed against streptococcus MG.

The significance of this non-hemolytic streptococcus in relation to primary atypical pneumonia is not yet clear. There appear to be a number of possible explanations which must be considered separately: First, it seems possible that the observed serological reactions might be the result of a coincidental antigenic relationship between this nonhemolytic streptococcus and some other agent, perhaps a virus, which is itself the causative agent in primary atypical pneumonia; second, it seems possible that this nonhemolytic streptococcus might occupy the role of secondary invader in primary atypical pneumonia; and third, it seems possible that this nonhemolytic streptococcus, either alone or in concert with some other infectious agent, might be primarily involved in the pathogenesis of primary atypical pneumonia. The available evidence is not sufficient to warrant the acceptance of this hypothesis at the present time, although the results of this study suggest paths for further explanation.—Thomas, L., Mirick, G. S., Curran, E. C., Jr., Ziegler, J. E., Jr., and Horsfall, F. L., Jr.: Studies on primary atypical pneumonia. II. Observations concerning relationship of nonhemolytic streptococcus to disease. To be published.—*U. S. Na. Med. Bull.*

Sulphanilamide and Sodium Bicarbonate.—Sulphanilamide tends to cause a shift in the reaction of the body fluids toward the acid side, bicarbonate being lost from the blood. It has been shown that this effect is primarily due to the renal excretion of more

bicarbonate (i.e., the kidney cells reabsorb less bicarbonate from the glomerular filtrate as it flows down the tubules); while the hyperpnea and loss of carbon dioxide from the lungs is a secondary compensation. Accordingly, this effect can be corrected for clinical purposes by giving sodium bicarbonate in doses equal to those of sulphanilamide.

There is some evidence that this action of sulphanilamide may possibly be connected with the ability of sulphanilamide to inhibit carbonic anhydrase, the enzyme which catalyses the liberation of carbon dioxide from the carbonate of the plasma.—Hawking, F.: Recent work on pharmacology of sulphonamides. *Brit. M. Bull.* 2: 64-70, 1944.—*U. S. Na. Med. Bull.*

SURGERY

Cancer of the thyroid.—Cancer of the thyroid is more common than is generally supposed. Cancer of the thyroid practically always arises in a thyroid already the seat of goitre. In the majority of cases there is of goitre. Although it may be a pre-existing adenoma. Although it may occur early in puberty, carcinoma of the thyroid is most commonly met with in the usual cancer period. It is rather more common in women than in men when malignant tumours are associated with Graves symptoms. It is possible that the initial hyperplasia belonging to the general disease passes rapidly into a malignant overgrowth which thence after dominates the picture. That a simple colloid goitre presenting a structure that usually remains harmless for years may give rise to metastatic tumours of benign ex-malignant type is one of the striking anomalies of the pathological thyroid. The gross appearance varies considerably. When arising from an adenoma the tumour remains encapsulated for a considerable time. Sooner or later there is invasion of the capsule, and infiltration of the surrounding tissue with involvement of the regional lymph nodes. In other cases the tumour is diffuse from the beginning. Microscopically, cancer of the thyroid is usually classified into medullary, adenocarcinomatous and scirrhous forms. Metastases occur by both lymphatic and blood stream spread. Secondary tumours are most common in the lungs and then in the bones. Metastases pass chiefly by the blood vessels. One peculiarity of these malignant metastases is their ability to revert to the normal type of thyroid tissue. Metastases are capable of normal physiological function.

The early signs and symptoms of malignant change in a thyroid are few and no one is pathognomic. A goitre slowly increasing in size which commences to enlarge at an accelerated rate should be suspected of being malignant. Increasing hardness suggests malignant change. Pain and fixation to the surrounding parts are features of importance. Hoarseness due to involvement of the recurrent laryngeal nerve is indicative. Methods of examination include a careful history, thorough physical examination, laryngeal examination and surgical biopsy.

TREATMENT.—Three methods are available; surgery, radiation therapy or a combination of the two. The best known therapy is the last. If post-operatively an area of unsuspected malignancy is found in the centre of an encapsulated adenoma, no further treatment is required. If the capsule

has been infiltrated or if the carcinomatous change has occurred in a diffuse goitre, it is advisable to follow radical surgical extirpation with adequate radiation therapy.—*The Bull. of the Vancouver Med. Ass.*

Continuous spinal anesthesia.—Two thousand cases are presented in which the authors have employed continuous spinal anesthesia. Their records show that in three cases satisfactory anesthesia was not obtained. One case developed uncontrollable cough during the course of a pulmonary lobectomy. The patient was given cyclopropane during the stage of tugging on the bronchus which caused the coughing. Sensory anesthesia at this time was at the level of the hyoid bone. In the two other cases, faulty technique and a busy schedule are to blame. They were both simple pelvic operations and neither patient was anesthetized to the degree that operation could be undertaken. They were both given other anesthesia. It must be explained that many of the anesthetics in this series were given by internees and relatively inexperienced anesthesiologists. Many of the cases in this series have been saved from being failures by the authors making of new punctures after what had been thought to be a satisfactory puncture had failed to produce satisfactory anesthesia. In several cases, the patient has been re-punctured after the abdomen had been opened and perfectly satisfactory anesthesia obtained.

Age.—The average age for this group was 35.9 years. The youngest was two days old, who was operated upon for congenital occlusion of the jejunum. A cholecystectomy and choledochostomy for stones on a man, age 87, represents the eldest of the series. With increased experience with this type of anesthesia in children, the authors have found that it is very satisfactory. In the last 1,000 cases, they have had 22 who were ten years or less, and 33 between ten years and fifteen. There were eight of five years or less. This has been made possible by the liberal use of morphine in multiple small doses, which they have found is very well tolerated by children. They have not encountered the profound respiratory depression in its use, and do not fear to use the drug in very young children.

Length of operations.—The average length of the operations in this series was 50.1 minutes. The longest procedure was a subtotal pancreatectomy which required five

hours and 25 minutes. The shortest procedure was about two minutes for the incision and drainage of an abscess.

Dosage:—The dosage of procaine for continuous spinal anesthesia is a variable factor. For the operations in this series, the total dosage per case averaged 210.9 mg. The average number of injections was 2.37. The smallest dose was 20 mg. for the amputation of a toe. The largest dose given to one patient was 2,200 mg. This was for a hysterectomy which required 35 minutes operating time.

In general, for the average cases, an initial dose of 150 mg. is given, which will usually give satisfactory anesthesia for any type of abdominal surgery. This is usually followed by an additional injection of 50 mg. every half hour for the remainder of the operation. However, many cases are encountered which do not require as much, and also many cases which require much larger doses. Children tolerate the drug very well, and will require relatively much larger doses than adults. On occasions as much as 250 mg. had to be given to a child of seven years in order to obtain satisfactory anesthesia to perform an appendectomy, which, of course, required no additional doses after anesthesia was produced. A suprapubic prostatectomy was performed on a man of 85 years, which required 60 minutes, with a total dose of 50 mg. The aged and very ill require very small doses. The dosage for any one case may be simply stated as being to complete the operative procedure. The condition of the patient is checked frequently, and sufficient dosage is given to produce the desired result. The longest procedure in the series was a subtotal pancreatectomy which required five hours and 25 minutes. The patient received 1,450 mg. of procaine, given in 18 injections.

The authors' routine procedure calls for the use of a 5 per cent. solution of procaine in spinal fluid. Additional doses may be prepared in sterile distilled water or normal saline. They have used various dilutions from 1 to 10 percent, but have found that the 5 percent solution is the most satisfactory. The blood pressure, pulse and respiration are checked and recorded every five minutes during the anesthesia. Following the injection of ephedrine along with the procaine which is used to anesthetize the skin for the puncture and to support the blood pressure, they regularly noted an increase in the pressure, which was soon followed by a lowering of the pressure to the original level, or slightly below. Unless the operation was of a shocking nature no great fall in the systolic pressure was encountered. The average systolic pressure at the beginning of operation for this series was 127 millimeters of mercury. The average at the conclusion of the operation was 114.3 millimeters of mercury. The average fall of systolic pressure was only 12.7 millimeters of mercury. There were a number of cases in which the blood pressure reached, and maintained, a higher level than that before the anesthesia was begun. This however, is an

exception to the rule. During the course of operations, there were pressures as low as 40 mm. Such cases were treated by infusions of glucose solution, blood or plasma. Seldom are vasopressor drugs used. To cite an example, during the course of a radical mastectomy, the blood pressure dropped to 40 mm. of mercury. The patient's exposed chest wall was covered with hot sponges, no further dissection was done, an intravenous of plasma was started and in about ten minutes the blood pressure was at 100 mm. of mercury. The operation was then resumed and completed with the patient in good condition. The authors feel that instances such as this prove that it is the surgery and not the anesthesia which causes the excessive falls in blood pressure.

Headache:—The incidence of headache following the use of continuous spinal anesthesia is about the same as following the use of the single-dose spinal. It is a very difficult thing to understand or explain. It appears to be more frequent following simple procedures than the more serious ones. The incidence of headache for this entire series was 3.1 percent. This problem is a relatively minor one, which usually responds to simple treatment, such as the administration of aspirin, and it is felt that it is a very low price to pay for the advantages of spinal anesthesia, both to the patient and the surgeon.

Urinary retention:—The authors have made it a rule to use an indwelling catheter in patients who are submitted to operations which may last a relatively long time, and who are receiving intravenous during the operation. The bladder often distends and if not taken care of tends to encourage retention. They also use an indwelling catheter in all vaginal plastic cases. Their incidence of retention, excluding the above mentioned cases, is 3.3 percent for the series.

Pulmonary complications:—In this series there were 45 cases which developed pulmonary complications. 27 of these were bronchopneumonia, 11 were lobar pneumonia, 5 were atelectasis, and 2 were pulmonary embolism.

Nerve system complications:—One case developed anesthesia of the upper lip immediately following a cystoscopic examination. This persisted for two days, then disappeared completely. There was nothing unusual about the anesthesia, the level was not high, and the authors cannot explain this occurrence on any other basis than hysteria. There were no other incidences of any type of neurologic complication.

Mortality:—There were 82 deaths in this series of 2,000 cases, making a gross mortality of 4.1 percent. The average time that elapsed between operation and death was 5.9 days. None of these were anesthetic deaths, and it is not felt that the anesthesia was a contributing factor in any of them. Thirty-six of these that died were suffering with malignant growths. There were 18 deaths from diffuse peritonitis. The other deaths were due to many conditions, pulmonary, cardiac

renal and hepatic. One death was due to hemorrhage from a far-advanced carcinoma of the cervix, the anesthesia being given for the operation of packing the vagina and rectum. There has been no death due directly to the use of continuous spinal anesthesia.—(Lommons, W. T. and Hager, H. G., Jr. *Annals of Surgery* 120:129-142, August, 1944.)—U.S.O.W.I.

Problems of exophthalmic goiter.—Ljunghusen calls attention to the fact that cases with post-operative and spontaneous thyrotoxic crises present the same aspect: rapid pulse and rise of temperature. The typical course is that of temporary hyperfunction followed by progressive destruction of the thyroid with its biologic sequelae. The concept of the absorption of thyroxine from the wound and of its predominance in the post-operative course is erroneous. The curves of pulse and of temperature of two different groups of patients were compared. One group consisted of patients on whom operation was performed for exophthalmic goiter, whereas surgical removal of a simple goiter was performed on those of the second group. In general, the simple goiter is larger than the exophthalmic goiter and the surgical exposure is greater. The thyroxine content of the wound surface is larger, and consequently a larger amount of thyroxine is likely to be absorbed. However, only a slight increase in the pulse and little rise of temperature was observed after the removal of a simple goiter, whereas a fulminant, post-operative crisis with severe tachycardia and hyperpyrexia occurred in cases of exophthalmic goiter in which preoperative iodine therapy had no effect. Compensatory adrenal hyperfunction is suggested as an adequate concept of the thyrotoxic crisis. Complete recovery resulted from subtotal strumectomy in cases of tuberculosis of the thyroid as well as in cases of exophthalmic goiter. This recovery, in spite of the biologic crippling of the organ, is considered as a link between the two processes which have so far been considered different in origin and character. Exophthalmic goiter after severe psychic trauma should not be considered as thyrogenic thyrosis but as severe and protracted stimulation of the thyroid gland and of the adrenals from the cerebrum. Thyrotropic hormone therapy in postoperative thyrotoxic crisis is suggested because the crisis may be caused by the increased thyroxine want, which cannot be met by the silenced remaining part of the thyroid may be increased, provided the remaining part is not too small and is sufficiently nourished. In case the thyrotoxic gland should contain a tuberculous agent, this will be found in the interstitial tissue. The thyroid of animals experimented on should be infected by the tuberculous origin of a study to clarify the tuberculous origin of the disease. A borderline may be demonstrated where the picture of tuberculosis may be found on one side and that of toxic diffuse goiter on the other. Roentgen

therapy proved successful in cases of mild hyperthyroidism and in severe cases in which operation had been omitted. The long duration of this therapy is its greatest disadvantage.—J.A.M.A.

The endocrine treatment of cancers of the prostate gland.—About 100 patients with cancer of the prostate have been treated at the Memorial Hospital either by castration or by the administration of stilbestrol given in doses of 1 to 5 mg. daily by mouth. Both forms of treatment have given striking clinical improvement, at least temporarily. Pain is abolished, appetite is increased, and a gain in weight results. These changes following castration are prompt. They occur more gradually with stilbestrol. After an average of seven to eight months the patients are apt to have a return of pain and obvious progression of disease to death. Institution of other treatment, stilbestrol in the castrated patients or castration in the patients treated originally with stilbestrol, fails to affect the unfavourable course of the disease. Some patients, following treatment, continue to remain clinically free from symptoms of prostatic cancer for long periods of time, two years or longer. The number of such prolonged arrests of cancer seems more frequent in the group treated with stilbestrol than by castration, so that this has become the author's routine initial form of treatment in the last 18 months. Stilbestrol seems to cause local regression in the size of the prostate and reduction in the amount of residual urine more frequently than castration. Changes in bony metastases in general are toward an increase in calcification. Whether this represents healing of the lesions, a change in their properties, or a spread of tumour is hard to say. Occasionally an increase in roentgen density may be accompanied by the appearance of new shadows not previously visible.

Serum phosphatase determinations have proved useful for diagnosis and as a method of following the course of the disease. Elevation of serum acid phosphatase above 1 Bodansky unit is pathognomonic of prostatic cancer, although a low acid phosphatase does not rule out the presence of this disease. Serum alkaline phosphatase is usually elevated when bone metastases are present. Serum acid phosphatase falls promptly in those patients who respond favourably to castration and rise again with a return of cancerous activity. The same changes occur more slowly in patients treated with stilbestrol. Serum alkaline phosphatase often rises following castration and then slowly falls. The rise is not so apt to be present in patients treated with stilbestrol. The cause of this rise and subsequent fall is unknown. Reactivation of metastatic disease is usually reflected by a rise in serum alkaline phosphatase. Castration decreases estrogenic excretion in the urine and usually causes a rise in androgen as measured colorimetrically as 17-ketosteroids by the Callow-Zimmerman test. I

causes a rise in excretion of pituitary gonadotropic hormones in the urine. The administration of stilbestrol decreases the output of the 17-ketosteroids and the gonadotropic hormone from the pituitary. After its administration the excretion of stilbestrol in the urine gives a marked rise in the estrogen assays. The authors' findings suggest that the mechanism whereby castration and stilbestrol cause regression of prostatic cancers is fundamentally different. (Dean, A.L., Woodward, H. Q. and Twombly, G. H. *Surgery* 16: 169-180, Aug. 1944).—*U. S. O. W.I.*

Regional ileitis.—Though the cause of ileitis is unknown, the disease is classified with disorders of the reticulo-endothelial system, since the earliest and most constant change is hyperplasia of the lymph adenoid tissue of the bowel wall and regional lymph nodes. The theories that it is due to tuberculosis or some other infective agent, or that it may be a manifestation of Bock's sarcoid, are not proven. The cardinal clinical features, are abdominal pain, loss of weight, and general debility; the signs of chronic intestinal obstruction; and a palpable mass either in the right iliac fossa or more usually in the pelvis. Barium X-ray studies show a long filling defect in the terminal ileum—the so-called, 'String sign.' X-ray examination of the chest is essential in making a differential diagnosis. The ideal treatment in primary resection with wide excision of the mesentery. This often means removal of the right side of the colon as well, but it depends on the extent of the oedema and thickening of the bowel wall. In cases complicated by fistula formation the operation may have to be done in stages. The results of excision, both immediate and remote, are excellent.—*B.M.J.*

Resuscitation of the heart.—Cardiac arrest capable of complete resuscitation, may result from asphyxia, reflex vagal inhibition, cardiac trauma, cardiac toxins, acute car-

diac dilatation, hæmorrhage and vasomotor paralysis with circulatory insufficiency, and electrocution. Indiscriminate intra cardiac injection of epinephrine or other sympathomimetic drugs is contra indicated. Sympathomimetic drugs should not be administered during cyclopropane anaesthesia, but 2% procaine-Hel administered prior to or in conjunction with intracardiac injection of epinephrine reduces potential ventricular fibrillation. Topical application of 5% procaine, 10% metycaine or 4% cocaine to the surface of the heart, a 2% solution injected into the chambers of the heart and electrical counter shock are the most effective methods of ventricular fibrillation. Manual massage of the heart should be instituted within 3 minutes of cessation of heart beat. The method of approach to the heart are the transperitoneal, sub-diaphragmatic, transperitoneal transdiaphragmatic, and trans-thoracic, the trans-thoracic approach being the method of choice.—*Am. J. Sur.*

Non-tropical elephantiasis.—It is assumed that the condition affects one leg, and that there is no discoverable vascular obstruction in the groin, pelvis, or abdomen. In such circumstances it may be possible in a favourable case to place a full-thickness (pedicle) skin graft with its lymphatics as a bridge between the 'oedematous' thigh and the normal abdominal skin. The graft should be placed so that the lymph stream through it may flow in the same direction as it followed when the skin was in its original position. When this method cannot be adopted, the alternative is to excise the thickened subcutaneous tissue with broad-longitudinal strips of the deep fascia; and then either to train the skin so that when it is sutured it fits tightly over the exposed muscles, or to remove the skin completely and make good the defect with split skin grafts placed directly on the muscle or fascia. This procedure must be carried out in multiple stages, one side of the limb being done at a time. Should this fail amputation may be inevitable.—*A.M.J.*

Proceedings of Associations

West Godavary District Branch of I.M.A.—The Second Annual Conference of this branch was held at Palakol on 28.1.45. At the business meeting presided over by Dr. V. Venkataratnam, the Second Annual Report submitted by the Secretary *inter alia* stated that due to the ban by the Madras Government on their employees becoming members of the I.M.A. the strength of the branch had dropped from 83 to 70 although nine new members were enlisted. The enthusiasm amongst members had not in any way waned. It was urged that all members of the independent medical profession should unite under the banner of the I.M.A. and protect the rights of the profession. The following office-bearers were elected for the year 1945-46:

President: Dr. V. Venkataratnam; **Vice-Presidents:** (1) Dr. G. Subba Raju, (2) Dr. Y. Suryanarayana, (3) N. Kutumba Rao; **General Secretary:** Dr. R. N. Raju. **Joint-Secretaries:** (1) Dr. A. P. Gopalan, (2) Dr. Bh. V. L. Narasimha Raju, (3) Dr. C. Rangarao; **Representatives for the Provincial Council:** (1) Dr. R. N. Raju, (2) Dr. V. Narasimha Rao, (3) Dr. T. S. Satyanarayana. All the members of the managing committee of the previous year were re-elected. The meeting then adjourned for lunch.

At 2 p.m. the Andhra Provincial Council of the I.M.A. met with Dr. P. Gurumurthy in the chair. The meeting considered the preliminary report of the President and Dr. M. V. Krishna Rao, Secretary, who recently toured the famine-stricken areas in the

North Vizag District, on the existing conditions there and proposed to start a camp hospital at Naupada for training health volunteers. Later in the evening at a public meeting they appealed to the public and the

profession for liberal contributions for "The North Vizag Medical Relief Fund."

At 3 p.m. the Scientific Section met with Dr. P. Veerayya of Guntur in the chair and many important subjects were discussed.

Book Reviews

Intravenous Therapy.—By K. V. THAKKAR, L.M. & S., Late Chief Medical Officer to the States of Palitana and Idar; Second Edition (1943)—Printed by K. V. Thakkar, Medical Building, Mama Kotha Road, Bhavanagar, Kathiwar. Pp. 350, with a coloured Frontispiece.

In this second edition Dr. Thakkar has revised to a very great extent the material since he wrote his first edition in 1930. During the period that has elapsed, since the publication of the first edition a large number of drugs have come into prominence and are in constant use. Many of these are added in the edition. Chapters on Saline and Hypertonic Saline, Arsenobenzol and Blood Transfusion have been revised. New chapters on intravenous drip, and intravenous anaesthesia and one on dangerous drugs to use intravenously have been added. There is also a chapter on Therapeutic Index of Diseases, and an intravenous table of doses. This little book contains much useful information for the student as well as the general practitioner.

Recent Advances in Therapeutics—Parts I and II.—By J. R. GOYAL, M.B.B.S., 2nd edition (1944)—Printed By A. C. JAIN, Rajhans Press, Sadar Bazaar, Delhi.

This is a second edition of a book published in 1941 by Dr. J. R. Goyal. Part I contains a detailed description of the Sulphonamide group of drugs. In this section, pharmacology, dosage, modes of administration, toxic effects, dangers and the therapeutic uses of many of the sulphonamide group of drugs are given in detail. In part II, among others, the following

deserve mention: Chapters on Vitamins, Hormones, Penicillin, Heparin, and those on modern treatment of burns, recent advances in anaesthesia and analgesia etc.,

All the subjects dealt with in this book are treated elaborately and extensively and we are sure it will prove a useful guide to the medical practitioners.

The Vascular Abnormalities and Tumours of the Spinal Cord and its Membranes.—By ROGER WYBURN-MASON, M.A., M.D., B. CHIR, M.R.C.P., M.R.C.S., 1943; (pp. 190) with 42 illustrations.

The subject matter of this book is one which has received little attention all these years. This is because of the difficulty in clinical diagnosis and also because of the failure to distinguish between the various pathological types of vascular anomalies and tumours which may occur in the spinal cord. But during the last 20 years, work in this special field have stimulated an interest in the study of this subject. Dr. Wyburn-Mason has reviewed critically the literature on the subject. His attempt to correlate clinical symptoms with various types of vascular anomalies and tumours is a valuable contribution to neurology. His introduction of kymography with the use of contrasting substances for the purpose of visual demonstration of pulsations in abnormal vessels is a valuable contribution to the subject of this monograph. He has compiled an appendix of 67 case notes which are very useful and illuminating and a very thorough reference list is given at the end of the book. This monograph is very good and is of great clinical importance and practical value.

Correspondence

Treatment of Malaria
To The Editors, The Antiseptic, Madras.
Sirs,

Ref:—My article on malaria published in The Antiseptic, October '44, and the comments of Dr. C. L. Dhabhai, L.M.F.P., Naraine, Jaipur State, thereon.

I am surprised to see how any doctor would ever be so very irresponsible as to wait and leisurely prepare the patient with purgatives and alkalies before he administers Quinine in a pernicious malignant tertian infection, as the one which the doctor seems to have in mind. I have stated in my paper treatment for the general cases of a non-pernicious type, where the regime I suggested has been proved to be the best and most economical.

It goes without saying that in proved, pernicious, malignant tertian infections, like the cerebral, hyperpyrexial, or algide forms, intravenous medication should be the rule without any delay.

Small doses of Quinine are used by many others and with as good results as I had. This again is not absolute as is understood by the doctor. I have stated in my paper that there may be exceptions and it obviously follows that bigger doses are necessary for such cases. Regarding the incidence of relapses, the only method of preventing them is by acquiring immunity by allowing one or two attacks untreated and then raise the resistance of the patient to a high level. Prevention of relapses is no more a success with larger doses of Quinine as it is with smaller doses.

As regards the prophylactic dose I had adopted, I always found it an excellent tonic besides being a prophylactic. I always combine this grain of Quinine with Nux Vomica, and Nitro Hydrochloric acid dil in mixture. I never disputed the other prophylactic measures like the mosquito net, etc., mentioned; in fact, I was not writing about anti-malarial measures in my paper. The paper aimed at only the treatment of malaria in general, with a word regarding prophylaxis.

Ellore,
21-12-44.

Yours Sincerely,
DR. CH. KRISHNAMURTY,
Asst. Dist. Medical
Officer.

An Unusual Case of F. B. removed per rectum

To The Editors, THE ANTISEPTIC, MADRAS.
Dear Sirs,

Reading the article on F. B. Rectum in the October issue and noting the facts, I am tempted to point out some interesting points that remain disclosed in the said article. It is of course very interesting to learn as to

what made the young sailor introduce such a big and strange thing inside his rectum.

The first that strikes is that he may be preparing himself for smuggling. He being a sailor might be visiting different ports and they are generally in the habit of bringing certain things in that way and to save it from the customs. But then, he might have selected a smooth round thing instead. So, the next to think might be his habit of 'Sodomy.' Being wild with his sex instinct it is just likely that the man takes up any damn thing nearby and without waiting to think about its *pros* and *cons*, he madly puts it in his rectum and being unsatisfied still, he takes another.

If still the habits and surroundings of this class be carefully studied many interesting points may yet be gathered which may produce a still more interesting subject for the medical public.

Truly yours,
DR. TRYAMBAKAL DEVJISHAI JOSHI,
I.A.M.C. (Regd.),
Gadchaitia via Bhuj-Cutch.

Licentiatees in the Army

The following is a letter received from one of our readers who is serving in the Indian Army, and who wants to bring to the notice of the authorities concerned certain injustices done to the licentiatees who joined the Army in Burma. We hope the authorities will redress their grievances. Their grievances seem to be genuine and deserve every consideration.

—Eds. A.

"The Licentiatees who joined the Army in Burma have not yet been given the King's Commission. These licentiatees number about 15, and mostly Indians, and qualified from Indian Medical Schools, but were in the Burma Medical Service. Since the formation of the I.A.M.C., we are asking the Burma Army to give us the same privileges that are given to the members of the

I.A.M.C. but so far our applications have not been favourably considered. As a matter of fact when we joined the Army in Burma, we were given a definite assurance that we will be given all the privileges and prospects of the I.M.D. doctors. The I.M.D's have now been given the King's Commission. For all purposes, we belong to the Indian Army and we believe our cases will be considered favourably. Many licentiatees who passed from Burma and who came to India as evacuees, have been successful in getting the King's Commission in the I.A.M.C., and we would therefore request you through the columns of your esteemed journal, to bring to the notice of the authorities our difficulties. We hope the authorities will give us favourable consideration."

Phlebograph or Jugular Tracing

While studying the clinical polygraph it struck me that the C wave in the jugular pulse tracing might be due to increase in the intra-auricular pressure brought about by the contraction of the papillary muscles of the ventricles closing the A. Valve, started by quicker nerve conduction, and corresponds to the R wave in the electrocardiogram. The V wave in the phlebogram might be due to venous stasis as is generally accepted and the doubling sometimes observed might be due to increase in the intra-

auricular pressure brought about by the flooding of the pulmonary and systemic by the right and left ventricles, naturally at different stages in the cardiac cycle, and producing back pressure waves through the valveless superior vena cava and the pulmonary veins respectively.

I solicit elucidation on these points from learned members of my profession.

Extension,
Salem,
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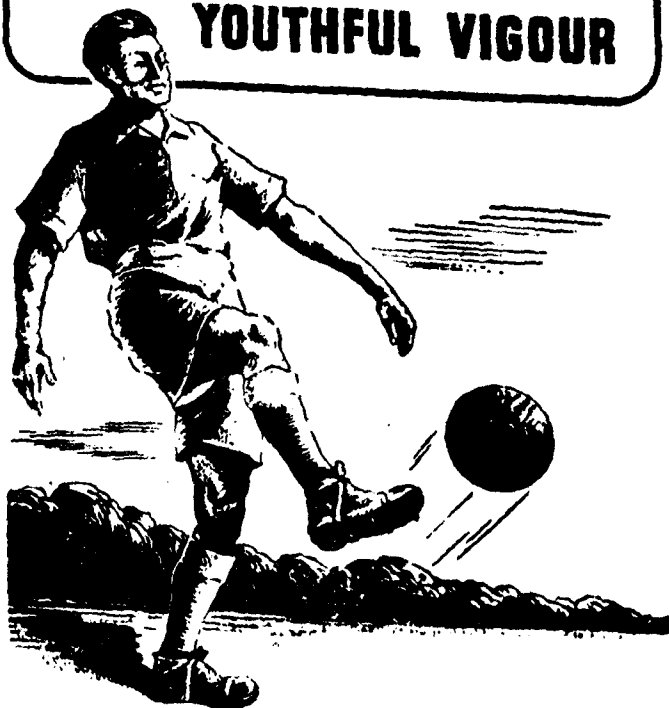
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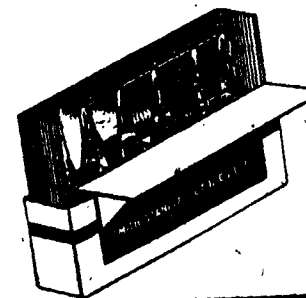
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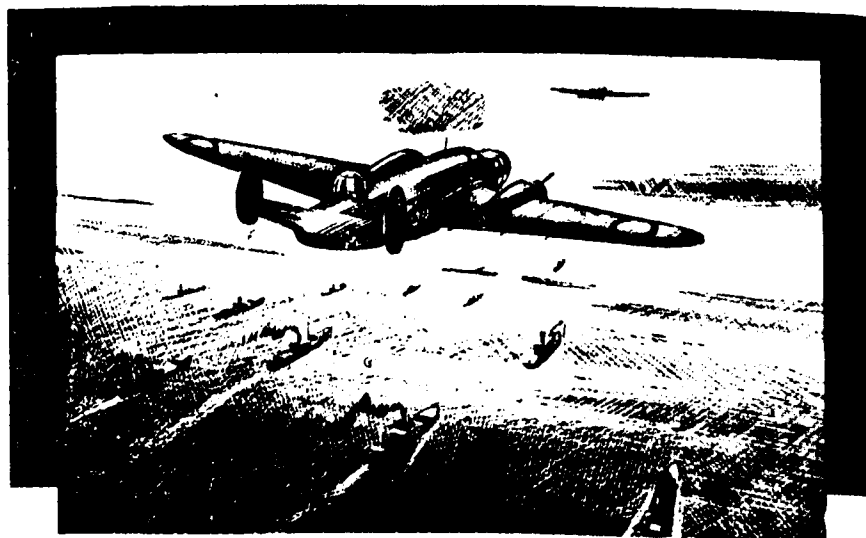
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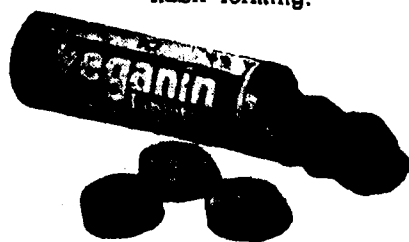
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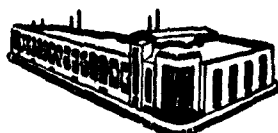


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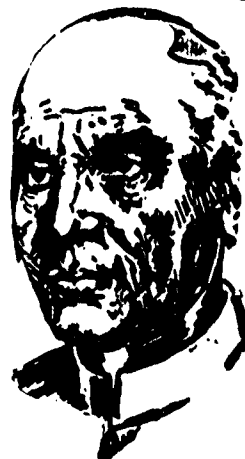
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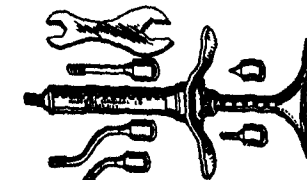


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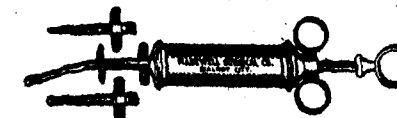
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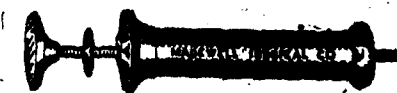
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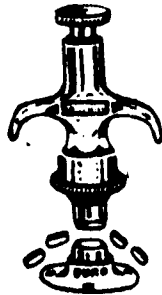
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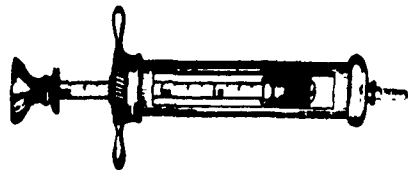
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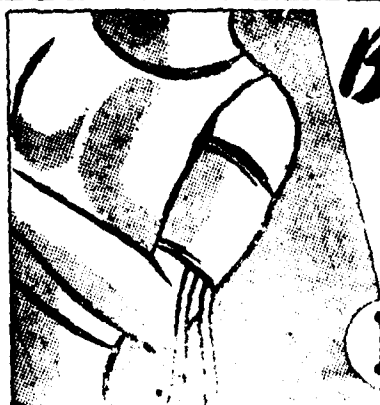
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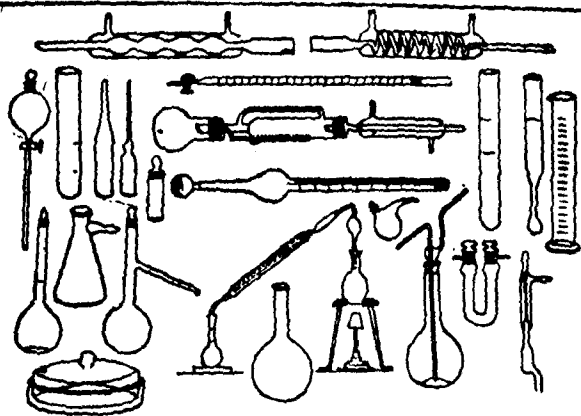
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